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### FAIRCHILD

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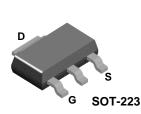
### **FQT7N10** N-Channel QFET<sup>®</sup> MOSFET 100 V, 1.7 A, 350 mΩ

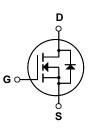
#### Description

This N-Channel enhancement mode power MOSFET is produced using Fairchild Semiconductor®'s proprietary planar stripe and DMOS technology. This advanced MOSFET technology has been especially tailored to reduce on-state resistance, and to provide superior switching performance and high avalanche energy strength. These devices are suitable for switched mode power supplies, audio amplifier, DC motor control, and variable switching power applications.

#### Features

- 1.7 A, 100 V,  $R_{DS(on)}$ =350 m $\Omega$ (Max.) @V<sub>GS</sub>=10 V, I<sub>D</sub>=0.85 A
- Low Gate Charge (Typ. 5.8 nC)
- Low Crss (Typ. 10 pF)
- 100% Avalanche Tested





### Absolute Maximum Ratings T<sub>c</sub> = 25°C unless otherwise noted

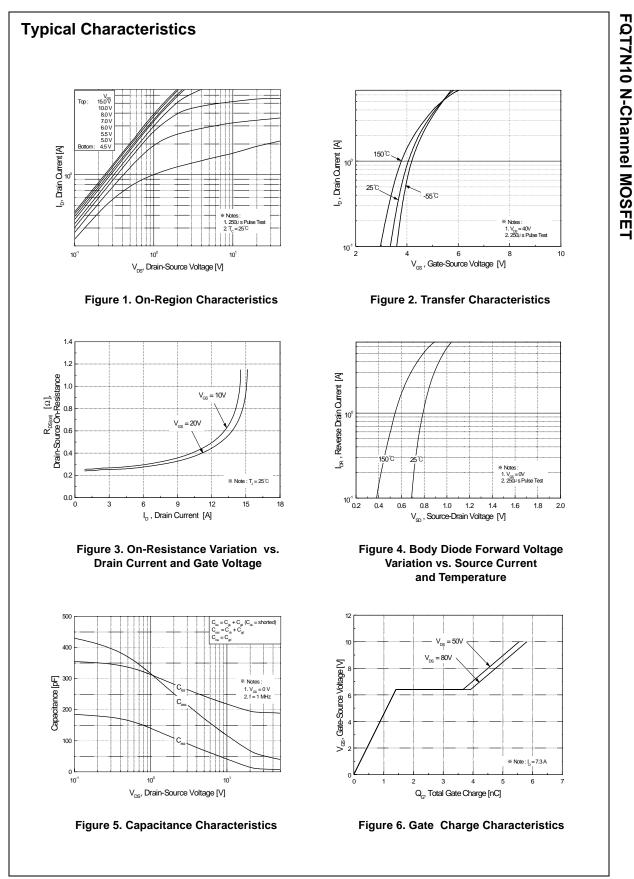
| Symbol                            | Parameter                                                                        |          | FQT7N10     | Unit |
|-----------------------------------|----------------------------------------------------------------------------------|----------|-------------|------|
| V <sub>DSS</sub>                  | Drain-Source Voltage                                                             |          | 100         | V    |
| D                                 | Drain Current - Continuous (T <sub>C</sub> = 25                                  | °C)      | 1.7         | А    |
|                                   | - Continuous (T <sub>C</sub> = 70°C)                                             |          | 1.36        | А    |
| DM                                | Drain Current - Pulsed                                                           | (Note 1) | 6.8         | А    |
| V <sub>GSS</sub>                  | Gate-Source Voltage                                                              |          | ± 25        | V    |
| E <sub>AS</sub>                   | Single Pulsed Avalanche Energy                                                   | (Note 2) | 50          | mJ   |
| AR                                | Avalanche Current                                                                | (Note 1) | 1.7         | А    |
| AR                                | Repetitive Avalanche Energy                                                      | (Note 1) | 0.2         | mJ   |
| dv/dt                             | Peak Diode Recovery dv/dt                                                        | (Note 3) | 6.0         | V/ns |
| PD                                | Power Dissipation ( $T_C = 25^{\circ}C$ )                                        |          | 2.0         | W    |
|                                   | - Derate above 25°C                                                              | 0.016    | W/°C        |      |
| T <sub>J</sub> , T <sub>STG</sub> | Operating and Storage Temperature Range                                          |          | -55 to +150 | °C   |
| ΓL                                | Maximum lead temperature for soldering purposes,<br>1/8" from case for 5 seconds |          | 300         | °C   |

#### **Thermal Characteristics**

| Symbol           | Parameter                                 | Тур | Max  | Unit |
|------------------|-------------------------------------------|-----|------|------|
| R <sub>0JA</sub> | Thermal Resistance, Junction-to-Ambient * |     | 62.5 | °C/W |

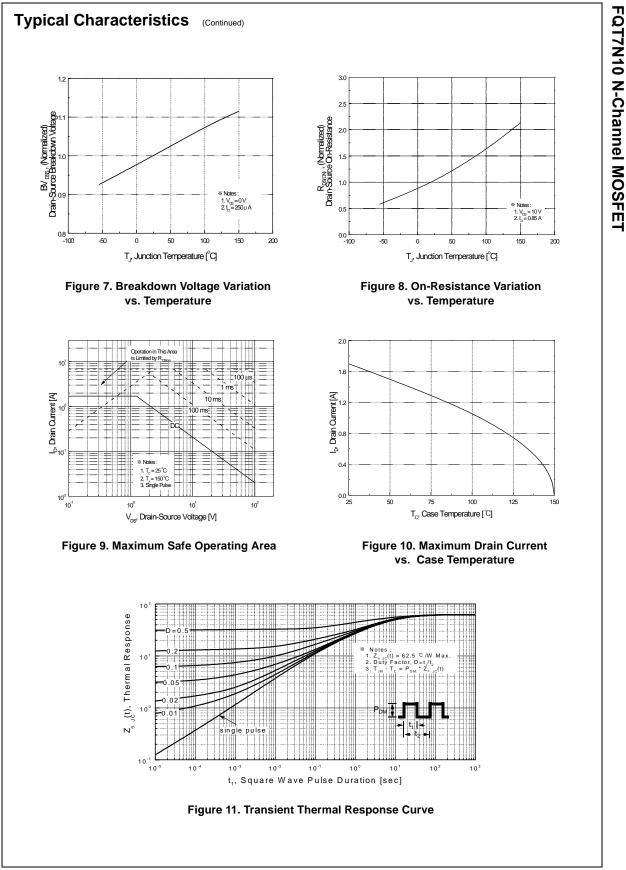
March 2013

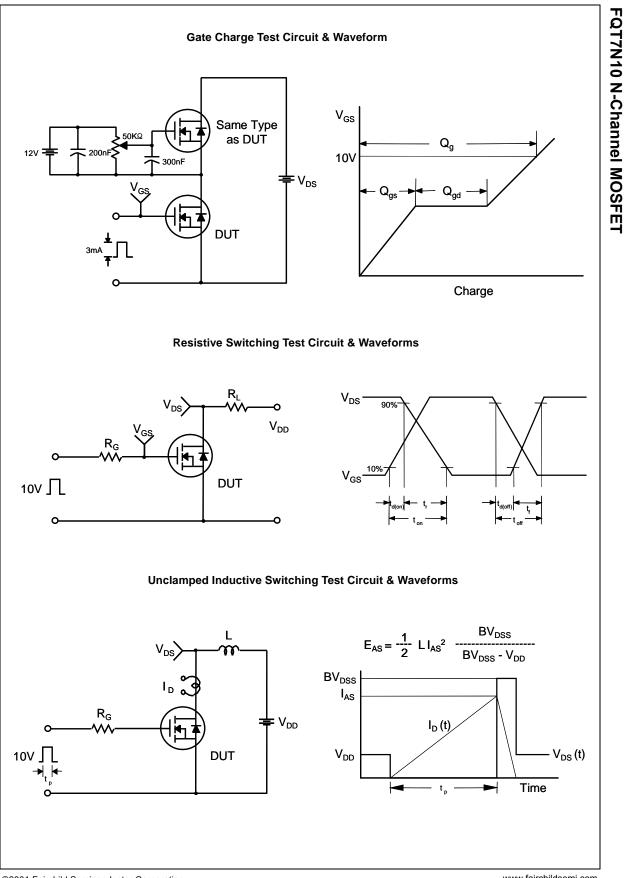
| $ \begin{array}{c c} \Delta BV_{DSS} \\ \Delta T_J \\ \hline \\ \Delta T_J \\ \hline \\ Coefficient \\ \hline \\ Coss \\ \hline \\ Coefficient \\ \hline \hline \\ Coefficient \\ \hline \\ Coeffi$ | I to 25°C                                                   | 100<br><br><br><br>2.0<br><br><br><br><br><br> | <br>0.1<br><br><br>0.28<br>1.85<br>190<br>60<br>10 | <br>1<br>100<br>100<br>-100<br>4.0<br>0.35<br><br>250<br>75<br>13<br>25 | V<br>V/°C<br>μA<br>ηA<br>nA<br>NA<br>NA<br>PF<br>pF<br>pF<br>ns |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------|-----------------------------------------------------------------|
| $\begin{array}{ c c c c } BV_{DSS} & Drain-Source Breakdown Voltage & V_{GS} = 0 \ V, \ I_D = 250 \ \mu A \\ \hline \Delta BV_{DSS} & Breakdown Voltage Temperature \\ ( \ \Delta T_J & Coefficient & I_D = 250 \ \mu A, \ Referenced \\ \hline I_D = 250 \ \mu A, \ Referenced \\ \hline V_{DS} = 100 \ V, \ V_{GS} = 0 \ V \\ \hline V_{DS} = 80 \ V, \ T_C = 125^{\circ}C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^{\circ}C \\ \hline I_{GSSF} & Gate-Body \ Leakage \ Current, \ Forward & V_{GS} = 25 \ V, \ V_{DS} = 0 \ V \\ \hline I_{GSSR} & Gate-Body \ Leakage \ Current, \ Reverse & V_{GS} = -25 \ V, \ V_{DS} = 0 \ V \\ \hline On \ Characteristics \\ \hline V_{GS(th)} & Gate \ Threshold \ Voltage & V_{DS} = V_{GS}, \ I_D = 250 \ \mu A \\ \hline R_{DS(on)} & Static \ Drain-Source \\ On-Resistance & V_{DS} = 10 \ V, \ I_D = 0.85 \ A \\ \hline g_{FS} & Forward \ Transconductance & V_{DS} = 40 \ V, \ I_D = 0.85 \ A \\ \hline Dynamic \ Characteristics \\ \hline C_{iss} & Input \ Capacitance \\ \hline C_{rss} & Reverse \ Transfer \ Capacitance \\ \hline C_{rss} & Reverse \ Transfer \ Capacitance \\ \hline Switching \ Characteristics \\ \hline t_{d(off)} & Turn-On \ Delay \ Time \\ \hline t_r & Turn-On \ Rise \ Time \\ \hline t_{d(off)} & Turn-Off \ Delay \ Time \\ \hline t_{d(off)} & Turn-Off \ Delay \ Time \\ \hline t_{d(off)} & Turn-Off \ Fall \ Time \\ \hline Q_g & Total \ Gate \ Charage \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V_{OS} =$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                             | <br><br>2.0<br><br><br>                        | 0.1<br><br><br>0.28<br>1.85<br>190<br>60<br>10     | <br>1<br>100<br>-100<br>4.0<br>0.35<br><br>250<br>75<br>13              | V/°C<br>μA<br>ηA<br>ηA<br>Ν<br>Ω<br>S<br>PF<br>pF<br>pF         |
| $ \begin{array}{c c c c c c c } \hline \Delta BV_{DS} & Breakdown Voltage Temperature & I_D = 250 \ \mu\text{A}, \ Reference & V_{DS} = 100 \ V, \ V_{GS} = 0 \ V \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^\circ C \\ \hline On \ Characteristics \\ \hline V_{DS} = 60 \ V, \ V_{DS} = 0 \ V \\ \hline On \ Characteristics \\ \hline V_{DS} = 0 \ V, \ V_{DS} = 0 \ V \\ \hline On \ Characteristics \\ \hline V_{DS} = 10 \ V, \ I_D = 250 \ \mu A \\ \hline V_{DS} = 10 \ V, \ I_D = 0.85 \ A \\ \hline Dynamic \ Characteristics \\ \hline C_{iss} & Input \ Capacitance \\ \hline V_{DS} = 25 \ V, \ V_{GS} = 0 \ V, \\ \hline f = 1.0 \ MHz \\ \hline C_{rss} & Reverse \ Transfer \ Capacitance \\ \hline Switching \ Characteristics \\ \hline t_{d(on)} & Turn-On \ Rise \ Time \\ \hline t_r & Turn-On \ Rise \ Time \\ \hline t_{d(off)} & Turn-Off \ Delay \ Time \\ \hline t_{d(off)} & Turn-Off \ Fall \ Time \\ \hline Q_g & Total \ Gate \ Charage \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{G} = 25 \ \Omega \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{G} = 25 \ \Omega \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{C} = 25 \ \Omega \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{C} = 25 \ \Omega \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{C} = 25 \ \Omega \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{C} = 1.0 \ M_{CS} = 1.0 \ A \ A \ B \ A \ B \ A \ B \ A \ B \ A \ B \ A \ B \ A \ B \ A \ B \ A \ B \ A \ B \ A \ A$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             | <br><br><br>2.0<br><br><br><br>                | <br><br>0.28<br>1.85<br>190<br>60<br>10            | 1<br>100<br>-100<br>0.35<br><br>250<br>75<br>13                         | μΑ<br>μΑ<br>nA<br>nA<br>V<br>Ω<br>S<br>PF<br>pF                 |
| Zero Gate Voltage Drain Current $V_{DS} = 80 \text{ V},  \text{T}_{C} = 125^{\circ}\text{C}$ $I_{GSSF}$ Gate-Body Leakage Current, Forward $V_{GS} = 25 \text{ V}, V_{DS} = 0 \text{ V}$ $I_{GSSR}$ Gate-Body Leakage Current, Reverse $V_{GS} = -25 \text{ V}, V_{DS} = 0 \text{ V}$ On Characteristics $V_{GS}$ $V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$ $V_{GS}(th)$ Gate Threshold Voltage $V_{DS} = 10 \text{ V}, I_D = 0.85 \text{ A}$ $P_{DS}(on)$ Static Drain-Source<br>On-Resistance $V_{DS} = 40 \text{ V}, I_D = 0.85 \text{ A}$ $g_{FS}$ Forward Transconductance $V_{DS} = 40 \text{ V}, I_D = 0.85 \text{ A}$ Dynamic Characteristics $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_D = 0.85 \text{ A}$ $C_{iss}$ Input Capacitance $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_f = 1.0 \text{ MHz}$ $C_{rss}$ Reverse Transfer Capacitance $V_{DD} = 50 \text{ V}, I_D = 7.3 \text{ A}, R_G = 25 \Omega$ $t_{d(off)}$ Turn-Off Delay Time $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A}, R_G = 25 \Omega$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | (Note 4)                                                    | <br><br>2.0<br><br><br><br>                    | <br><br>0.28<br>1.85<br>190<br>60<br>10            | 10<br>100<br>-100<br>0.35<br><br>250<br>75<br>13                        | μA<br>nA<br>nA<br>V<br>Ω<br>S<br>PF<br>pF                       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (Note 4)                                                    | <br>2.0<br><br><br>                            | <br><br>0.28<br>1.85<br>190<br>60<br>10            | 100<br>-100<br>4.0<br>0.35<br><br>250<br>75<br>13                       | nA<br>nA<br>V<br>Ω<br>S<br>PF<br>pF<br>pF                       |
| IGSSRGate-Body Leakage Current, Reverse $V_{GS} = -25 \text{ V}, V_{DS} = 0 \text{ V}$ On Characteristics $V_{GS(th)}$ Gate Threshold Voltage $V_{DS} = V_{GS}, I_D = 250 \mu \text{A}$ $R_{DS(on)}$ Static Drain-Source<br>On-Resistance $V_{GS} = 10 \text{ V}, I_D = 0.85 \text{ A}$ $g_{FS}$ Forward Transconductance $V_{DS} = 40 \text{ V}, I_D = 0.85 \text{ A}$ <b>Dynamic Characteristics</b> $V_{DS} = 40 \text{ V}, I_D = 0.85 \text{ A}$ <b>Dynamic Characteristics</b> $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_D = 0.85 \text{ A}$ <b>Dynamic Characteristics</b> $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_f = 1.0 \text{ MHz}$ $C_{oss}$ Output Capacitance<br>$C_{rss}$ $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_f = 1.0 \text{ MHz}$ <b>Switching Characteristics</b> $V_{DD} = 50 \text{ V}, I_D = 7.3 \text{ A}, I_f$ $T_{d(off)}$ Turn-On Rise Time<br>$T_{d(off)}$ $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A}, I_f$ $T_q$ Turn-Off Fall Time<br>$Q_g$ $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A}, I_f$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | (Note 4)                                                    | <br>2.0<br><br><br>                            | <br>0.28<br>1.85<br>190<br>60<br>10                | -100<br>4.0<br>0.35<br><br>250<br>75<br>13                              | nA<br>V<br>Ω<br>S<br>PF<br>pF                                   |
| On Characteristics $V_{GS}(th)$ Gate Threshold Voltage $V_{DS} = V_{GS}$ , $I_D = 250 \mu A$ $R_{DS}(on)$ Static Drain-Source<br>On-Resistance $V_{GS} = 10  V$ , $I_D = 0.85  A$ $g_{FS}$ Forward Transconductance $V_{DS} = 40  V$ , $I_D = 0.85  A$ Dynamic Characteristics $C_{iss}$ Input Capacitance $V_{DS} = 25  V$ , $V_{GS} = 0  V$ , $C_{oss}$ Output Capacitance $V_{DS} = 25  V$ , $V_{GS} = 0  V$ , $C_{rss}$ Reverse Transfer Capacitance $f = 1.0  \text{MHz}$ $C_{rss}$ Reverse Transfer Capacitance $V_{DD} = 50  V$ , $I_D = 7.3  A$ , $t_{q}(on)$ Turn-On Rise Time $V_{DD} = 50  V$ , $I_D = 7.3  A$ , $t_{q}(off)$ Turn-Off Delay Time $V_{DS} = 80  V$ , $I_D = 7.3  A$ , $q_g$ Total Gate Charge $V_{DS} = 80  V$ , $I_D = 7.3  A$ ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (Note 4)                                                    | 2.0<br><br><br><br><br>                        | <br>0.28<br>1.85<br>190<br>60<br>10                | 4.0<br>0.35<br><br>250<br>75<br>13                                      | V<br>Ω<br>S<br>PF<br>PF                                         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (Note 4)                                                    | <br><br><br>                                   | 0.28<br>1.85<br>190<br>60<br>10                    | 0.35<br><br>250<br>75<br>13                                             | Ω<br>S<br>pF<br>pF                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | (Note 4)                                                    | <br><br><br>                                   | 0.28<br>1.85<br>190<br>60<br>10                    | 0.35<br><br>250<br>75<br>13                                             | Ω<br>S<br>pF<br>pF                                              |
| On-ResistanceVGS = 10 V, ID = 0.00 A $g_{FS}$ Forward Transconductance $V_{DS} = 40 V, I_D = 0.85 A$ Dynamic CharacteristicsV $C_{iss}$ Input Capacitance $V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz$ $C_{rss}$ Reverse Transfer Capacitance $f = 1.0 MHz$ $C_{rss}$ Reverse Transfer Capacitance $V_{DD} = 50 V, I_D = 7.3 A, R_G = 25 \Omega$ $t_{d(off)}$ Turn-On Rise Time $R_G = 25 \Omega$ $t_f$ Turn-Off Delay Time $V_{DS} = 80 V, I_D = 7.3 A, R_G = 25 \Omega$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | (Note 4)                                                    |                                                | 1.85<br>190<br>60<br>10                            | <br>250<br>75<br>13                                                     | PF<br>PF<br>PF                                                  |
| Dynamic Characteristics $C_{iss}$ Input Capacitance $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V},$ $C_{oss}$ Output Capacitance $f = 1.0 \text{ MHz}$ $C_{rss}$ Reverse Transfer Capacitance $f = 1.0 \text{ MHz}$ Switching Characteristics $V_{DD} = 50 \text{ V}, I_D = 7.3 \text{ A},$ $t_{d(off)}$ Turn-On Rise Time $R_G = 25 \Omega$ $t_{d(off)}$ Turn-Off Delay Time $R_G = 25 \Omega$ $t_{f}$ Turn-Off Fall Time $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A},$ $Q_g$ Total Gate Charge $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A},$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | (Note 4)                                                    |                                                | 190<br>60<br>10                                    | 250<br>75<br>13                                                         | pF<br>pF<br>pF                                                  |
| $\begin{tabular}{ c c c c c c } \hline C_{iss} & Input Capacitance & V_{DS} = 25 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \\ \hline C_{oss} & Output Capacitance & f = 1.0 \text{ MHz} \\ \hline C_{rss} & Reverse Transfer Capacitance & f = 1.0 \text{ MHz} \\ \hline \hline Switching Characteristics & & \\ \hline t_{d(on)} & Turn-On Delay Time & V_{DD} = 50 \text{ V}, \text{ I}_{D} = 7.3 \text{ A}, \\ \hline t_{r} & Turn-On Rise Time & & \\ \hline t_{d(off)} & Turn-Off Delay Time & & \\ \hline t_{f} & Turn-Off Fall Time & & \\ \hline Q_{g} & Total Gate Charge & & V_{DS} = 80 \text{ V}, \text{ I}_{D} = 7.3 \text{ A}, \\ \hline \end{tabular}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |                                                | 60<br>10                                           | 75<br>13                                                                | pF<br>pF                                                        |
| $\begin{tabular}{ c c c c c c } \hline C_{iss} & Input Capacitance & V_{DS} = 25 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \\ \hline C_{oss} & Output Capacitance & f = 1.0 \text{ MHz} \\ \hline C_{rss} & Reverse Transfer Capacitance & f = 1.0 \text{ MHz} \\ \hline \hline Switching Characteristics & & \\ \hline t_{d(on)} & Turn-On Delay Time & V_{DD} = 50 \text{ V}, \text{ I}_{D} = 7.3 \text{ A}, \\ \hline t_{r} & Turn-On Rise Time & & \\ \hline t_{d(off)} & Turn-Off Delay Time & & \\ \hline t_{f} & Turn-Off Fall Time & & \\ \hline Q_{g} & Total Gate Charge & & V_{DS} = 80 \text{ V}, \text{ I}_{D} = 7.3 \text{ A}, \\ \hline \end{tabular}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |                                                | 60<br>10                                           | 75<br>13                                                                | pF<br>pF                                                        |
| $\begin{tabular}{ c c c c c } \hline & V_{DS} = 25 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \\ \hline & V_{DS} = 25 \text{ V}, \text{ V}_{GS} = 0 \text{ V}, \\ \hline & f = 1.0 \text{ MHz} \end{tabular}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |                                                | 60<br>10                                           | 75<br>13                                                                | pF<br>pF                                                        |
| $\begin{tabular}{ c c c c c } \hline \hline C_{rss} & Reverse Transfer Capacitance & & & & & \\ \hline \hline C_{rss} & Reverse Transfer Capacitance & & & & \\ \hline \hline Switching Characteristics & & & & \\ \hline \hline t_{d(on)} & Turn-On Delay Time & & & & \\ \hline t_r & Turn-On Rise Time & & & & \\ \hline \hline t_{d(off)} & Turn-Off Delay Time & & & & \\ \hline \hline t_f & Turn-Off Fall Time & & & \\ \hline \hline Q_g & Total Gate Charge & & V_{DS} = 80 \ V, \ I_D = 7.3 \ A, & & \\ \hline \hline \end{array}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                             |                                                | 10                                                 | 13                                                                      | pF                                                              |
| Switching Characteristics $t_{d(on)}$ Turn-On Delay Time $t_r$ Turn-On Rise Time $t_{d(off)}$ Turn-Off Delay Time $t_f$ Turn-Off Fall Time $Q_g$ Total Gate Charge $V_{DS} = 80 V, I_D = 7.3 A, I_D = $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                             |                                                | I                                                  | 1                                                                       |                                                                 |
| $ \begin{array}{c c} \hline \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                | 7                                                  | 25                                                                      | ns                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                                | 7                                                  | 25                                                                      | ns                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                                |                                                    |                                                                         |                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                                | 24                                                 | 60                                                                      | ns                                                              |
| $Q_g$ Total Gate Charge $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A},$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                             |                                                | 13                                                 | 35                                                                      | ns                                                              |
| B3 , D ,                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | (Note 4, 5)                                                 |                                                | 19                                                 | 50                                                                      | ns                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | $V_{DS} = 80$ V, $I_D = 7.3$ A, $V_{GS} = 10$ V (Note 4, 5) |                                                | 5.8                                                | 7.5                                                                     | nC                                                              |
| $Q_{gs}$ Gate-Source Charge $V_{GS} = 10 V$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                             |                                                | 1.4                                                |                                                                         | nC                                                              |
| Q <sub>gd</sub> Gate-Drain Charge                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                | 2.5                                                |                                                                         | nC                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                                |                                                    |                                                                         |                                                                 |
| Drain-Source Diode Characteristics and Maximum Rating                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | S                                                           |                                                |                                                    |                                                                         |                                                                 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Maximum Continuous Drain-Source Diode Forward Current       |                                                |                                                    | 1.7                                                                     | A                                                               |
| Maximum Pulsed Drain-Source Diode Forward Current                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                             |                                                |                                                    | 6.8                                                                     | A                                                               |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                             |                                                |                                                    |                                                                         |                                                                 |
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| arr Reverse Recovery Charge arr 100 / 445                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | (14010 4)                                                   |                                                | 150                                                |                                                                         | ne                                                              |
| Off         Drain-Source Diode Forward Voltage $V_{GS} = 0 \text{ V}, \text{ I}_S = 1.7 \text{ A}$ $t_{rr}$ Reverse Recovery Time $V_{GS} = 0 \text{ V}, \text{ I}_S = 7.3 \text{ A},$ $Q_{rr}$ Reverse Recovery Charge $dI_F / dt = 100 \text{ A}/\mu \text{s}$ Notes:         1. Repetitive Rating : Pulse width limited by maximum junction temperature           2. L = 26mH, $I_{AS} = 1.7A, V_{DD} = 25V, R_G = 25 \Omega, Starting T_J = 25^{\circ}C$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | (Note 4)                                                    |                                                | <br>70<br>150                                      | 1.5<br><br>                                                             | V<br>ns<br>nC                                                   |



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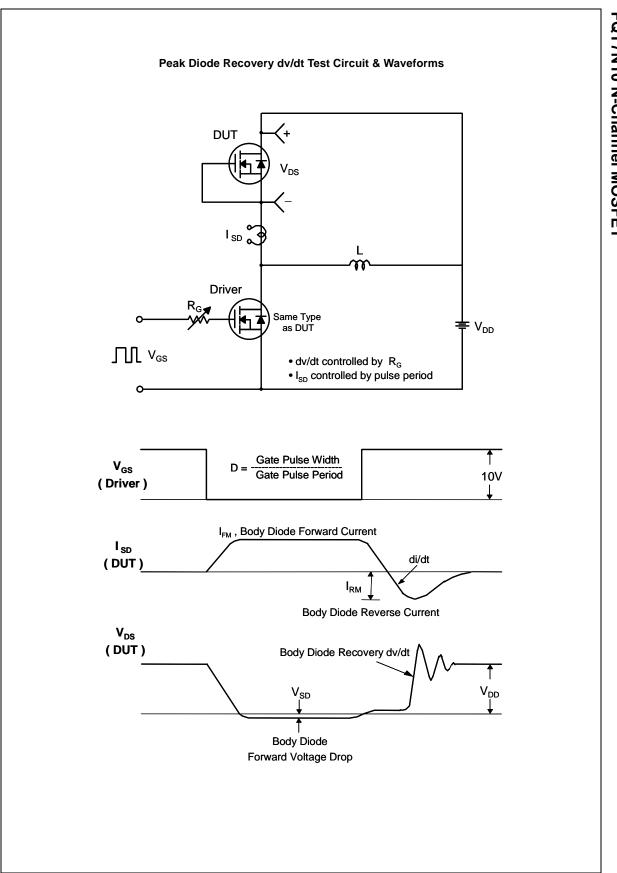
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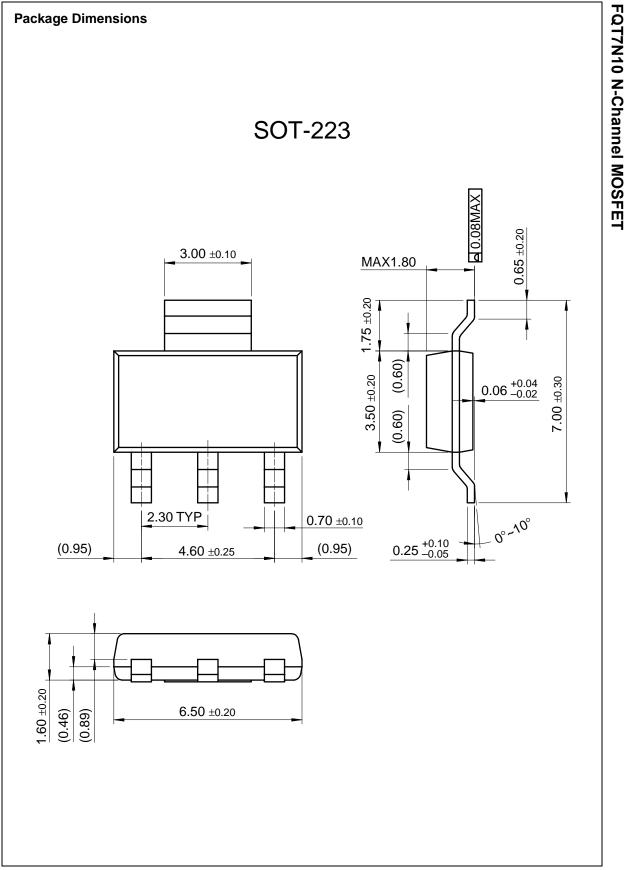




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