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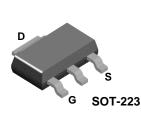
FQT7N10 N-Channel QFET[®] MOSFET 100 V, 1.7 A, 350 mΩ

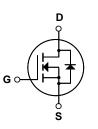
Description

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 Ω (Max.) @V_{GS}=10 V, I_D=0.85 A
- Low Gate Charge (Typ. 5.8 nC)
- Low Crss (Typ. 10 pF)
- 100% Avalanche Tested





Absolute Maximum Ratings T_c = 25°C unless otherwise noted

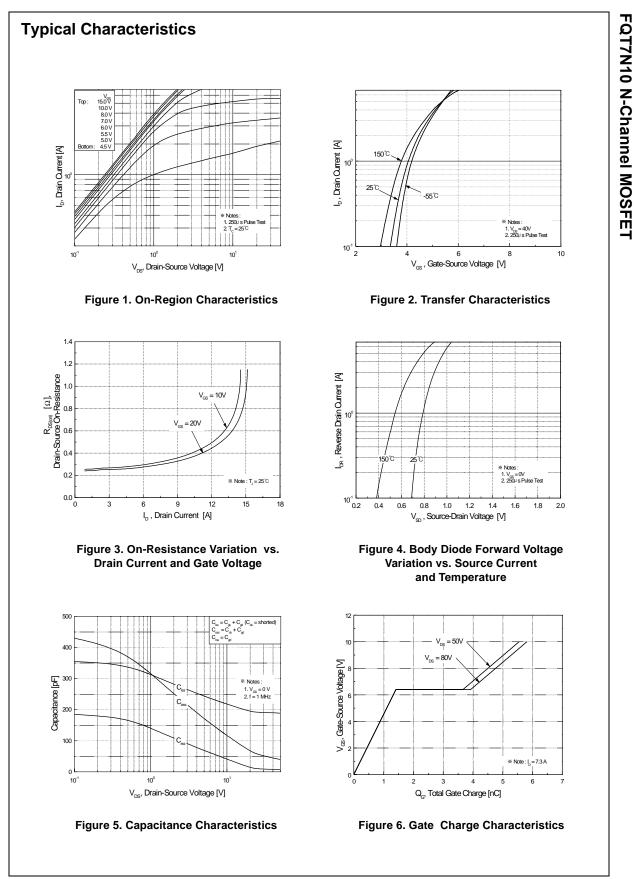
Symbol	Parameter		FQT7N10	Unit
V _{DSS}	Drain-Source Voltage		100	V
D	Drain Current - Continuous (T _C = 25	°C)	1.7	А
	- Continuous (T _C = 70°C)		1.36	А
DM	Drain Current - Pulsed	(Note 1)	6.8	А
V _{GSS}	Gate-Source Voltage		± 25	V
E _{AS}	Single Pulsed Avalanche Energy	(Note 2)	50	mJ
AR	Avalanche Current	(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 _J , T _{STG}	Operating and Storage Temperature Range		-55 to +150	°C
ΓL	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		300	°C

Thermal Characteristics

Symbol	Parameter	Тур	Max	Unit
R _{0JA}	Thermal Resistance, Junction-to-Ambient *		62.5	°C/W

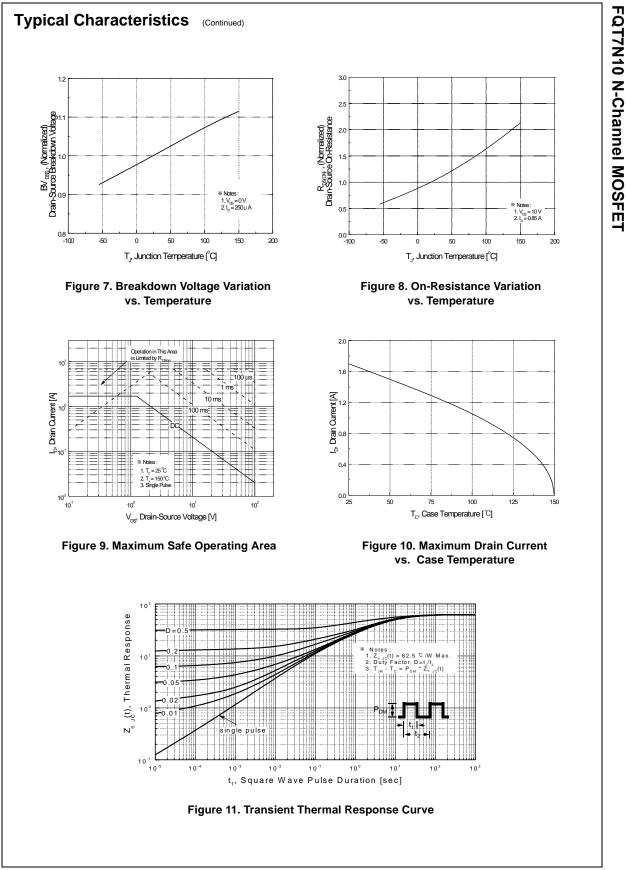
March 2013

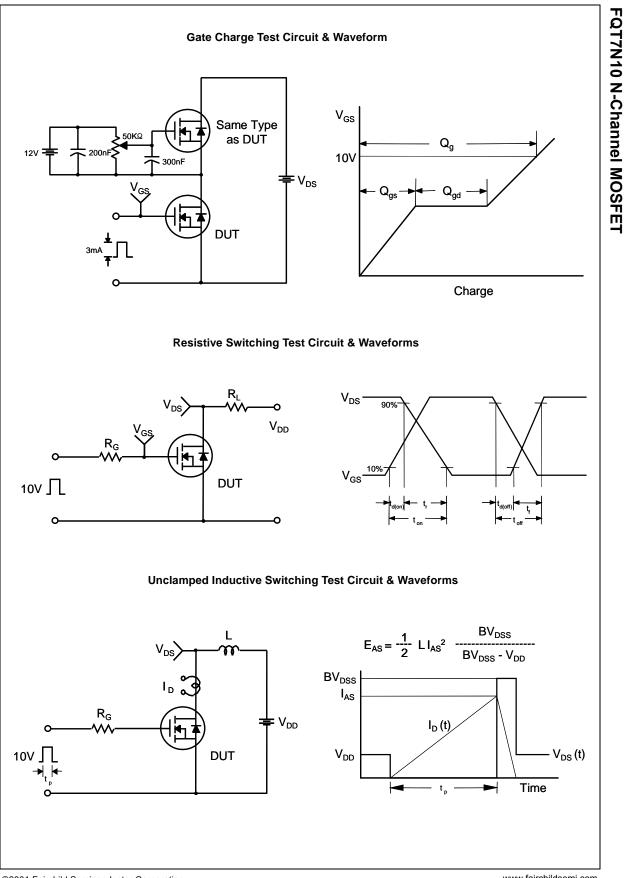
$ \begin{array}{c c} \Delta BV_{DSS} \\ \Delta T_J \\ \hline \\ \Delta T_J \\ \hline \\ Coefficient \\ \hline \\ Coss \\ \hline \\ Coefficient \\ \hline \hline \\ Coefficient \\ \hline \\ Coeffi$	I to 25°C	100 2.0 	 0.1 0.28 1.85 190 60 10	 1 100 100 -100 4.0 0.35 250 75 13 25	V V/°C μA ηA nA NA NA PF pF pF ns
$\begin{array}{ c c c c } BV_{DSS} & Drain-Source Breakdown Voltage & V_{GS} = 0 \ V, \ I_D = 250 \ \mu A \\ \hline \Delta BV_{DSS} & Breakdown Voltage Temperature \\ (\ \Delta T_J & Coefficient & I_D = 250 \ \mu A, \ Referenced \\ \hline I_D = 250 \ \mu A, \ Referenced \\ \hline V_{DS} = 100 \ V, \ V_{GS} = 0 \ V \\ \hline V_{DS} = 80 \ V, \ T_C = 125^{\circ}C \\ \hline V_{DS} = 80 \ V, \ T_C = 125^{\circ}C \\ \hline I_{GSSF} & Gate-Body \ Leakage \ Current, \ Forward & V_{GS} = 25 \ V, \ V_{DS} = 0 \ V \\ \hline I_{GSSR} & Gate-Body \ Leakage \ Current, \ Reverse & V_{GS} = -25 \ V, \ V_{DS} = 0 \ V \\ \hline On \ Characteristics \\ \hline V_{GS(th)} & Gate \ Threshold \ Voltage & V_{DS} = V_{GS}, \ I_D = 250 \ \mu A \\ \hline R_{DS(on)} & Static \ Drain-Source \\ On-Resistance & V_{DS} = 10 \ V, \ I_D = 0.85 \ A \\ \hline g_{FS} & Forward \ Transconductance & V_{DS} = 40 \ V, \ I_D = 0.85 \ A \\ \hline Dynamic \ Characteristics \\ \hline C_{iss} & Input \ Capacitance \\ \hline C_{rss} & Reverse \ Transfer \ Capacitance \\ \hline C_{rss} & Reverse \ Transfer \ Capacitance \\ \hline Switching \ Characteristics \\ \hline t_{d(off)} & Turn-On \ Delay \ Time \\ \hline t_r & Turn-On \ Rise \ Time \\ \hline t_{d(off)} & Turn-Off \ Delay \ Time \\ \hline t_{d(off)} & Turn-Off \ Delay \ Time \\ \hline t_{d(off)} & Turn-Off \ Fall \ Time \\ \hline Q_g & Total \ Gate \ Charage \\ \hline V_{DS} = 80 \ V, \ I_D = 7.3 \ A, \\ \hline R_{OS} = 80 \ V_{OS} =$		 2.0 	0.1 0.28 1.85 190 60 10	 1 100 -100 4.0 0.35 250 75 13	V/°C μA ηA ηA Ν Ω S PF pF 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$		 2.0 	 0.28 1.85 190 60 10	1 100 -100 0.35 250 75 13	μΑ μΑ nA nA V Ω S PF 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 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)	 2.0 	 0.28 1.85 190 60 10	10 100 -100 0.35 250 75 13	μA nA nA V Ω S PF pF
	(Note 4)	 2.0 	 0.28 1.85 190 60 10	100 -100 4.0 0.35 250 75 13	nA nA V Ω S PF pF 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 On-Resistance $V_{GS} = 10 \text{ V}, I_D = 0.85 \text{ A}$ g_{FS} Forward Transconductance $V_{DS} = 40 \text{ V}, I_D = 0.85 \text{ A}$ Dynamic Characteristics $V_{DS} = 40 \text{ V}, I_D = 0.85 \text{ A}$ Dynamic Characteristics $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_D = 0.85 \text{ A}$ Dynamic Characteristics $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_f = 1.0 \text{ MHz}$ C_{oss} Output Capacitance C_{rss} $V_{DS} = 25 \text{ V}, V_{GS} = 0 \text{ V}, I_f = 1.0 \text{ MHz}$ Switching Characteristics $V_{DD} = 50 \text{ V}, I_D = 7.3 \text{ A}, I_f$ $T_{d(off)}$ Turn-On Rise Time $T_{d(off)}$ $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A}, I_f$ T_q Turn-Off Fall Time Q_g $V_{DS} = 80 \text{ V}, I_D = 7.3 \text{ A}, I_f$	(Note 4)	 2.0 	 0.28 1.85 190 60 10	-100 4.0 0.35 250 75 13	nA V Ω S PF pF
On Characteristics $V_{GS}(th)$ Gate Threshold Voltage $V_{DS} = V_{GS}$, $I_D = 250 \mu A$ $R_{DS}(on)$ Static Drain-Source 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 	 0.28 1.85 190 60 10	4.0 0.35 250 75 13	V Ω S PF PF
	(Note 4)	 	0.28 1.85 190 60 10	0.35 250 75 13	Ω S pF pF
	(Note 4)	 	0.28 1.85 190 60 10	0.35 250 75 13	Ω S pF 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)		1.85 190 60 10	 250 75 13	PF PF 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 60 10	250 75 13	pF pF 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 10	75 13	pF 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 10	75 13	pF 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 10	75 13	pF 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 _{gd} 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
	(Noto 4)				
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)		 70 150	1.5 	V ns nC



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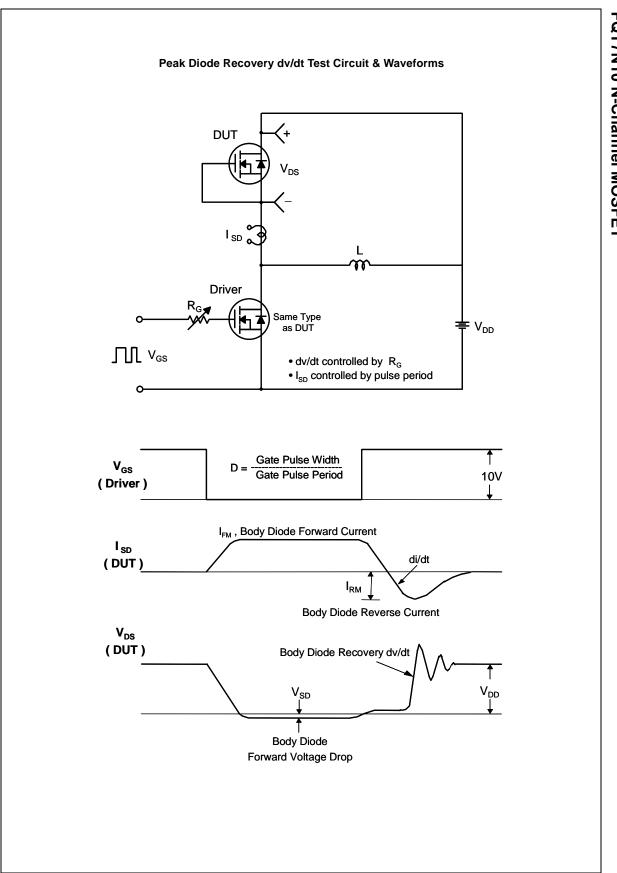
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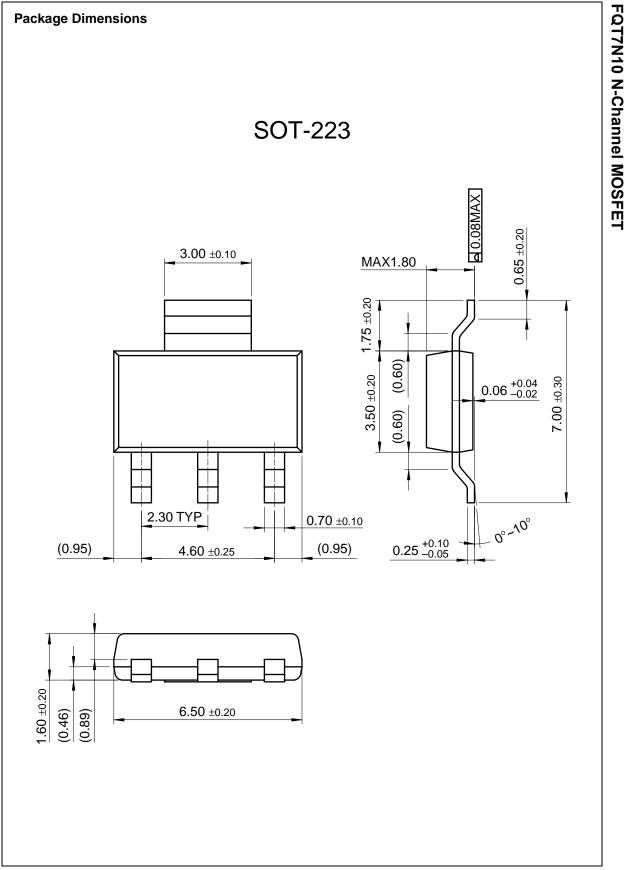




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Preliminary	First Production	Datasheet contains preliminary data; supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve design.
No Identification Needed	Full Production	Datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice to improve the design.
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