MOSFET – Power, N-Channel, POWERTRENCH®
100 V, 80 A, 9 mΩ

FDH3632, FDP3632, FDB3632

Features
• $R_{DS(ON)} = 7.5 \text{ mΩ (Typ.)}, V_{GS} = 10 \text{ V}, I_D = 80 \text{ A}$
• $Q_g (\text{tot}) = 84 \text{ nC (Typ.)}, V_{GS} = 10 \text{ V}$
• Low Miller Charge
• Low $Q_{rr}$ Body Diode
• UIS Capability (Single Pulse and Repetitive Pulse)
• These Devices are Pb–Free and are RoHS Compliant

Applications
• Synchronous Rectification
• Battery Protection Circuit
• Motor Drives and Uninterruptible Power Supplies
• Micro Solar Inverter

<table>
<thead>
<tr>
<th>$V_{DSS}$</th>
<th>$R_{DS(ON)} \text{ MAX}$</th>
<th>$I_D \text{ MAX}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 V</td>
<td>9 mΩ</td>
<td>80 A</td>
</tr>
</tbody>
</table>

MARKING DIAGRAM

SY&Z&3&K
FDX3632

$Y$ = ON Semiconductor Logo
&Z = Assembly Plant Code
&3 = Data Code (Year & Week)
&K = Lot
FDX3632 = Specific Device Code
X = H/P/B

ORDERING INFORMATION
See detailed ordering and shipping information on page 2 of this data sheet.
MOSFET MAXIMUM RATINGS (T_C = 25°C, Unless otherwise noted)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>VＤＳS</td>
<td>Drain to Source Voltage</td>
<td>100</td>
<td>V</td>
</tr>
<tr>
<td>VＧS</td>
<td>Gate to Source Voltage</td>
<td>±20</td>
<td>V</td>
</tr>
<tr>
<td>IＤ</td>
<td>Drain Current</td>
<td>80</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>– Continuous (TＣ &lt; 111°C, VＧS = 10 V)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Continuous (Tａmb = 25°C, VＧS = 10 V,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RＪＡ = 43°C/W)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>IＤ</td>
<td>Drain Current</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Pulsed</td>
<td>Figure 4</td>
<td>A</td>
</tr>
<tr>
<td>EＡS</td>
<td>Single Pulse Avalanche Energy (Note 1)</td>
<td>337</td>
<td>mJ</td>
</tr>
<tr>
<td>PＤ</td>
<td>Power Dissipation</td>
<td>310</td>
<td>W</td>
</tr>
<tr>
<td></td>
<td>(TＣ = 25°C)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>– Derate Above 25°C</td>
<td>2.07</td>
<td>W/°C</td>
</tr>
<tr>
<td>TＪ, TＳTG</td>
<td>Operating and Storage Temperature Range</td>
<td>−55 to +175</td>
<td>°C</td>
</tr>
</tbody>
</table>

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Starting TＪ = 25°C, L = 0.12mH, IＡS = 75 A, VＤD = 80 V.

THERMAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>RＪJC</td>
<td>Thermal Resistance, Junction to Case, Max. TO–220, D2—PAK, TO–247</td>
<td>0.48</td>
<td>°C/W</td>
</tr>
<tr>
<td>RＪJA</td>
<td>Thermal Resistance, Junction to Ambient, Max. TO–220 (Note 2)</td>
<td>62</td>
<td>°C/W</td>
</tr>
<tr>
<td>RＪJA</td>
<td>Thermal Resistance, Junction to Ambient, D2—PAK, Max. 1 in² copper pad area</td>
<td>43</td>
<td>°C/W</td>
</tr>
<tr>
<td>RＪJA</td>
<td>Thermal Resistance, Junction to Ambient, Max. TO–247 (Note 2)</td>
<td>30</td>
<td>°C/W</td>
</tr>
</tbody>
</table>

2. Pulse Width = 100 s

PACKAGE MARKING AND ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Device Marking</th>
<th>Device</th>
<th>Package</th>
<th>Reel Size</th>
<th>Tape Width</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDB3632</td>
<td>D2—PAK</td>
<td>330 mm</td>
<td>24 mm</td>
<td>800 Units</td>
<td></td>
</tr>
<tr>
<td>FDP3632</td>
<td>TO—220</td>
<td>Tube</td>
<td>N/A</td>
<td>50 Units</td>
<td></td>
</tr>
<tr>
<td>FDH3632</td>
<td>TO—247</td>
<td>Tube</td>
<td>N/A</td>
<td>30 Units</td>
<td></td>
</tr>
</tbody>
</table>
### ELECTRICAL CHARACTERISTICS  \((T_C = 25^\circ C \text{ unless otherwise noted})\)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Parameter</th>
<th>Test Conditions</th>
<th>Min.</th>
<th>Typ.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>OFF CHARACTERISTICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BVDS</td>
<td>Drain to Source Breakdown Voltage</td>
<td>ID = 250 μA, VGS = 0 V</td>
<td>100</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>IDSS</td>
<td>Zero Gate Voltage Drain Current</td>
<td>VDS = 80 V, VGS = 0 V</td>
<td>1</td>
<td></td>
<td></td>
<td>μA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>VDS = 80 V, VGS = 0 V, TC = 150°C</td>
<td>250</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IGS</td>
<td>Gate to Source Leakage Current</td>
<td>VGS = ±20 V</td>
<td>±100</td>
<td></td>
<td></td>
<td>nA</td>
</tr>
<tr>
<td><strong>ON CHARACTERISTICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VGSTH</td>
<td>Gate to Source Threshold Voltage</td>
<td>VGS = VDS, ID = 250 μA</td>
<td>2.0</td>
<td>4.0</td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>RDSON</td>
<td>Drain to Source On Resistance</td>
<td>ID = 80 A, VGS = 10 V</td>
<td>0.0075</td>
<td>0.009</td>
<td></td>
<td>Ω</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID = 40 V, VGS = 6 V</td>
<td>0.009</td>
<td>0.015</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ID = 80 A, VGS = 10 V, TC = 175 °C</td>
<td>0.018</td>
<td>0.022</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DYNAMIC CHARACTERISTICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ciss</td>
<td>Input Capacitance</td>
<td>VDS = 25 V, VGS = 0 V, f = 1 MHz</td>
<td>6000</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>Coss</td>
<td>Output Capacitance</td>
<td></td>
<td>820</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>Crss</td>
<td>Reverse Transfer Capacitance</td>
<td></td>
<td>200</td>
<td></td>
<td></td>
<td>pF</td>
</tr>
<tr>
<td>Qg(tot)</td>
<td>Total Gate Charge at 10 V</td>
<td>VGS = 0 V to 10 V, VDD = 50 V, ID = 80 A, Ig = 1 mA</td>
<td>84</td>
<td>110</td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>Qg(th)</td>
<td>Threshold Gate Charge</td>
<td>VGS = 0 V to 2 V, VDD = 50 V, ID = 80 A, Ig = 1 mA</td>
<td>11</td>
<td>14</td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>Qgs</td>
<td>Gate to Source Gate Charge</td>
<td>VDD = 50 V, ID = 80 A, Ig = 1 mA</td>
<td>30</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>Qgs2</td>
<td>Gate Charge Threshold to Plateau</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td>Qgd</td>
<td>Gate to Drain “Miller” Charge</td>
<td></td>
<td>20</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
<tr>
<td><strong>RESISTIVE SWITCHING CHARACTERISTICS  ((VGS = 10 V))</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDON</td>
<td>Turn-On Time</td>
<td>VDD = 50 V, ID = 80 A, VGS = 10 V, RDGS = 3.6 Ω</td>
<td>102</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>IDON</td>
<td>Turn-On Delay Time</td>
<td></td>
<td>30</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Dr</td>
<td>Rise Time</td>
<td></td>
<td>39</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>IDOFF</td>
<td>Turn-Off Delay Time</td>
<td></td>
<td>96</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>Df</td>
<td>Fall Time</td>
<td></td>
<td>46</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>DOFF</td>
<td>Turn-Off Time</td>
<td></td>
<td>213</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td><strong>DRAIN–SOURCE DIODE CHARACTERISTICS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VSD</td>
<td>Source to Drain Diode Voltage</td>
<td>ISD = 80 A</td>
<td>1.25</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td></td>
<td></td>
<td>ISD = 40 A</td>
<td>1</td>
<td></td>
<td></td>
<td>V</td>
</tr>
<tr>
<td>tR</td>
<td>Reverse Recovery Time</td>
<td>ISD = 75 A, dVSD/dt = 100 A/μs</td>
<td>64</td>
<td></td>
<td></td>
<td>ns</td>
</tr>
<tr>
<td>QRR</td>
<td>Reverse Recovered Charge</td>
<td></td>
<td>120</td>
<td></td>
<td></td>
<td>nC</td>
</tr>
</tbody>
</table>

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.
TYPICAL CHARACTERISTICS

$T_C = 25^\circ C$ unless otherwise noted

**Figure 1.** Normalized Power Dissipation vs. Ambient Temperature

**Figure 2.** Maximum Continuous Drain Current vs Case Temperature

**Figure 3.** Normalized Maximum Transient Thermal Impedance

**Figure 4.** Peak Current Capability

**Notes:**
- Duty Factor: $D = \frac{t_1}{t_2}$
- Peak $T_J = P_{DM} \times Z_{JC} \times R_{JC} + T_C$
- Transconductance may limit current in this region
- Current limited by package
- Duty Cycle - Descending Order
- Single Pulse

**Example: Derating Current**

For temperatures above $25^\circ C$, derate peak current as follows:

\[ I = I_{25} \left( \frac{175 - T_C}{150} \right) \]
TYPICAL CHARACTERISTICS (Continued)

TC = 25°C unless otherwise noted

NOTE: Refer to ON Semiconductor Application Notes AN-7514 and AN-7515
TYPICAL CHARACTERISTICS (Continued)

TC = 25°C unless otherwise noted

Figure 11. Normalized Gate Threshold Voltage vs. Junction Temperature

Figure 12. Normalized Drain to Source Breakdown Voltage vs Junction Temperature

Figure 13. Capacitance vs. Drain to Source Voltage

Figure 14. Gate Charge Waveforms for Constant Gate Currents
Figure 15. Unclamped Energy Test Circuit

Figure 16. Unclamped Energy Waveforms

Figure 17. Gate Charge Test Circuit

Figure 18. Gate Charge Waveforms

Figure 19. Switching Time Test Circuit

Figure 20. Switching Time Waveforms
Thermal Resistance vs. Mounting Pad Area

The maximum rated junction temperature, TJM, and the thermal resistance of the heat dissipating path determines the maximum allowable device power dissipation, PDM, in an application. Therefore the application’s ambient temperature, TA (°C), and thermal resistance $R_{thJA}$ (°C/W) must be reviewed to ensure that TJM is never exceeded. Equation 1 mathematically represents the relationship and serves as the basis for establishing the rating of the part.

$$P_{DM} = \frac{(T_{JM} - T_A)}{R_{thJA}} \quad \text{(eq. 1)}$$

In using surface mount devices such as the TO-263 package, the environment in which it is applied will have a significant influence on the part's current and maximum power dissipation ratings. Precise determination of PDM is complex and influenced by many factors:

1. Mounting pad area onto which the device is attached and whether there is copper on one side or both sides of the board.
2. The number of copper layers and the thickness of the board.
3. The use of external heat sinks.
4. The use of thermal vias.
5. Air flow and board orientation.
6. For non steady state applications, the pulse width, the duty cycle and the transient thermal response of the part, the board and the environment they are in.

ON Semiconductor provides thermal information to assist the designer’s preliminary application evaluation. Figure 21 defines the $R_{thJA}$ for the device as a function of the top copper (component side) area. This is for a horizontally positioned FR-4 board with 1 oz copper after 1000 seconds of steady state power with no air flow. This graph provides the necessary information for calculation of the steady state junction temperature or power dissipation. Pulse applications can be evaluated using the ON Semiconductor device Spice thermal model or manually utilizing the normalized maximum transient thermal impedance curve.

Thermal resistances corresponding to other copper areas can be obtained from Figure 21 or by calculation using Equation 2 or 3. Equation 2 is used for copper area defined in inches square and equation 3 is for area in centimeter square.

Area in in$^2$.

$$R_{thJA} = 26.51 + \frac{19.84}{(0.262 + \text{Area})} \quad \text{(eq. 2)}$$

Area in cm$^2$.

$$R_{thJA} = 26.51 + \frac{128}{(1.69 + \text{Area})} \quad \text{(eq. 3)}$$

Figure 21. Thermal Resistance vs. Mounting Pad Area
PSPICE Electrical Model
.SUBCKT FDB3632 2 1 3 ; rev May 2002

CA 12 8 1.7e−9
Cb 15 14 2.5e−9
Cin 6 8 6.0e−9

Dbbody 7 5 DbbodyMOD
Dbreak 5 11 DbreakMOD
Dplcap 10 5 DplcapMOD

Ebbreak 11 7 17 18 102.5
Eds 14 8 5 8 1
Egs 13 8 6 8 1
Evtemp 6 21 19 8 1

It 8 17 1

Lgate 1 9 5.61e−9
Ldrain 2 5 1.0e−9
Lsource 3 7 2.7e−9

RLgate 1 9 56.1
RLdrain 2 5 10
RLsource 3 7 27

Mmed 16 6 8 MmedMOD
Mstro 16 6 8 MstroMOD
Mweak 16 21 8 MweakMOD

Rbreak 17 18 RbreakMOD 1
Rdc 50 16 RdcMOD 3.8e−3
Rgate 9 20 1.1
RSLC1 5 51 RSLCMOD 1.0e−6
RSLC2 5 50 1.0e3
Rsource 8 7 RsquadMOD 2.5e−3
Rvthres 22 8 RvthresMOD 1
Rvtemp 18 19 RvtempMOD 1

S1a 6 12 13 8 S1AMOD
S1b 13 12 13 8 S1BMOD
S2a 6 15 14 13 S2AMOD
S2b 13 15 14 13 S2BMOD

Vbat 22 19 DC 1

ESLC 51 50 VALUE=({V((5,51)/ABS(V(5,51)))*(PWR(V(5,51)/(1e−6*350),3))})

.MODEL DbbodyMOD D (IS=5.9E−11 N=1.07 RS=2.3e−3 TRS1=3.0e−3 TRS2=1.0e−6
+ CJO=4e−9 M=0.58 TT=4.8e−8 XTI=4.2)
.MODEL DbreakMOD D (RS=0.17 TRS1=3.0e−3 TRS2=−8.9e−6)
.MODEL DplcapMOD D (CJO=15e−10 IS=1.0e−30 N=10 M=0.6)

.MODEL MstroMOD NMOS (VTO=4.1 KP=200 IS=1e−30 N=10 TOX=1 L=1u W=1u)
.MODEL MmedMOD NMOS (VTO=3.4 KP=10.0 IS=1e−30 N=10 TOX=1 L=1u W=1u RG=1.1)
.MODEL MweakMOD NMOS (VTO=2.75 KP=0.05 IS=1e−30 N=10 TOX=1 L=1u W=1u RG=1.1e+1 RS=0.1)

.MODEL RbreakMOD RES (TC1=1.0e−3 TC2=−1.7e−6)
.MODEL RdcMOD RES (TC1=8.5e−3 TC2=2.8e−5)
.MODEL RSLCMOD RES (TC1=2.0e−3 TC2=2.0e−6)
.MODEL RsourceMOD RES (TC1=4e−3 TC2=1e−6)
.MODEL RvthresMOD RES (TC1=−4.0e−3 TC2=−1.8e−5)
.MODEL RvtempMOD RES (TC1=−4.4e−3 TC2=2.2e−6)

.MODEL S1AMOD VSWITCH (RON=1e−5 ROFF=0.1 VON=−4 VOFF=−2)
.MODEL S1BMOD VSWITCH (RON=1e−5 ROFF=0.1 VON=−2 VOFF=−4)
.MODEL S2AMOD VSWITCH (RON=1e−5 ROFF=0.1 VON=−0.8 VOFF=0.4)
.MODEL S2BMOD VSWITCH (RON=1e−5 ROFF=0.1 VON=0.4 VOFF=−0.8)
.ENDS


Figure 22. PSPICE Electrical Model
SABER Electrical Model
REV May 2002

template FDB3632 n2,n1,n3
electrical n2,n1,n3
{
  var i iscl
dp..model dbodymod = (isl=5.9e−11, nl=1.07, rs=2.3e−3, trs1=3.0e−3, trs2=1.0e−6, cjo=4e−9, m=0.58, tt=4.8e−8, xti=4.2)
dp..model dbreakmod = (rs=0.17, trs1=3.0e−3, trs2=−8.9e−6)
dp..model dplcapmod = (cjo=15e−10, isl=1.0e−30, nl=10, m=0.6)
m..model mstrongmod = (type=_n, vto=4.1, kp=200, is=1e−30, tox=1)
m..model mmmedmod = (type=_n, vto=3.4, kp=10.0, is=1e−30, tox=1)
m..model mwweakmod = (type=_n, vto=2.75, kp=0.05, is=1e−30, tox=1, rs=0.1)
sw_vcs..model s1amod = (ron=1e−5, roff=0.1, von=−4, voff=−2)
sw_vcs..model s2amod = (ron=1e−5, roff=0.1, von=−0.8, voff=0.4)
sw_vcs..model s2bmod = (ron=1e−5, roff=0.1, von=0.4, voff=−0.8)
c.ca n12 n8 = 1.7e−9
c.cb n15 n14 = 2.5e−9
c.cin n6 n8 = 6.0e−9
dp.dbody n7 n5 = model=dbodymod
dp.dbreak n5 n11 = model=dbreakmod
dp.dplcap n10 n5 = model=dplcapmod

spe.ebreak n11 n7 n17 n18 = 102.5
spe.eds n14 n8 n5 n8 = 1
spe.egs n13 n8 n6 n8 = 1
spe.esg n6 n10 n6 n8 = 1
spe.evthres n6 n21 n19 n8 = 1
spe.evtemp n20 n6 n18 n22 = 1
i.it n8 n17 = 1
l.lgate n1 n9 = 5.61e−9
l.ldrain n2 n5 = 1.0e−9
l.lsoure n3 n7 = 2.7e−9
res.rlgate n1 n9 = 56.1
res.rldrain n2 n5 = 10
res.rsource n3 n7 = 27
m.mmed n16 n6 n8 n8 = model:mmmedmod, l=1u, w=1u
m.mstrong n16 n6 n8 n8 = model:mmstrongmod, l=1u, w=1u
m.mweak n16 n21 n8 n8 = model:mmweakmod, l=1u, w=1u
res.rbreak n17 n18 = 1, tc1=1.0e−3, tc2=−1.7e−6
res.rdrain n50 n16 = 3.8e−3, tc1=8.5e−3, tc2=2.8e−5
res.rgate n9 n20 = 1.1
res.rscl1 n5 n51 = 1.0e−6, tc1=2.0e−3, tc2=2.0e−6
res.rscl2 n5 n50 = 1.0e3
res.rsoure n8 n7 = 2.5e−3, tc1=4e−3, tc2=1e−6
res.rvthres n22 n8 = 1, tc1=−4.0e−3, tc2=−1.8e−5
res.rvtemp n18 n19 = 1, tc1=−4.4e−3, tc2=2.2e−6
sw_vcs..s1a n6 n12 n13 n8 = model=s1amod
sw_vcs..s1b n13 n12 n13 n8 = model=s1bmod
sw_vcs..s2a n6 n15 n14 n13 = model=s2amod
sw_vcs..s2b n13 n15 n14 n13 = model=s2bmod
v.vbat n22 n19 = dc=1
equations {
i (n51-->n50) +=iscl
iscl: \( v(n51,n50) = ((v(n5,n51)/(1e-9+abs(v(n5,n51))))*\text{abs}(v(n5,n51)*1e6/350)^\text{3})) \)

Figure 23. SABER Electrical Model
FDH3632, FDP3632, FDB3632

SPICE Thermal Model
REV May 2002

FDB3632
CTHERM1 TH 6 7.5e−3
CTHERM2 6 5 8.0e−3
CTHERM3 5 4 9.0e−3
CTHERM4 4 3 2.4e−2
CTHERM5 3 2 3.4e−2
CTHERM6 2 TL 6.5e−2
RThERM1 TH 6 3.1e−4
RThERM2 6 5 2.5e−3
RThERM3 5 4 2.2e−2
RThERM4 4 3 8.1e−2
RThERM5 3 2 1.35e−1
RThERM6 2 TL 1.5e−1

SABER Thermal Model
SABER thermal model FDB3632
template thermal_model th tl
thermal_c th, tl
{
  ctherm.ctherm1 th 6 =7.5e−3
  ctherm.ctherm2 6 5 =8.0e−3
  ctherm.ctherm3 5 4 =9.0e−3
  ctherm.ctherm4 4 3 =2.4e−2
  ctherm.ctherm5 3 2 =3.4e−2
  ctherm.ctherm6 2 tl =6.5e−2
  rtherm.rtherm1 th 6 =3.1e−4
  rtherm.rtherm2 6 5 =2.5e−3
  rtherm.rtherm3 5 4 =2.2e−2
  rtherm.rtherm4 4 3 =8.1e−2
  rtherm.rtherm5 3 2 =1.35e−1
  rtherm.rtherm6 2 tl =1.5e−1
}

Figure 24. Thermal Model

POWERTRENCH is a registered trademark of Semiconductor Components Industries, LLC (SCILLC) or its subsidiaries in the United States and/or other countries.

www.onsemi.com
13
TO-247–3LD SHORT LEAD
CASE 340CK
ISSUE A

DATE 31 JAN 2019

NOTES: UNLESS OTHERWISE SPECIFIED.

A. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH, AND TIE BAR EXTRUSIONS.
B. ALL DIMENSIONS ARE IN MILLIMETERS.
C. DRAWING CONFORMS TO ASME Y14.5 - 2009.
D. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.
E. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.

GENERIC MARKING DIAGRAM*

AYWWZZ
XXXXXXX
XXXXXXX

XXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Assembly Lot Code

*This information is generic. Please refer to device data sheet for actual part marking.
Pb-Free indicator, “G” or microdot “‡”, may or may not be present. Some products may not follow the Generic Marking.

DIM MILLIMETERS

<table>
<thead>
<tr>
<th>DIM</th>
<th>MIN</th>
<th>NOM</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>4.58</td>
<td>4.70</td>
<td>4.82</td>
</tr>
<tr>
<td>A1</td>
<td>2.20</td>
<td>2.40</td>
<td>2.60</td>
</tr>
<tr>
<td>A2</td>
<td>1.40</td>
<td>1.50</td>
<td>1.60</td>
</tr>
<tr>
<td>b</td>
<td>1.17</td>
<td>1.26</td>
<td>1.35</td>
</tr>
<tr>
<td>b2</td>
<td>1.53</td>
<td>1.65</td>
<td>1.77</td>
</tr>
<tr>
<td>b4</td>
<td>2.42</td>
<td>2.54</td>
<td>2.66</td>
</tr>
<tr>
<td>c</td>
<td>0.51</td>
<td>0.61</td>
<td>0.71</td>
</tr>
<tr>
<td>D</td>
<td>20.32</td>
<td>20.57</td>
<td>20.82</td>
</tr>
<tr>
<td>D1</td>
<td>13.08</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>D2</td>
<td>0.51</td>
<td>0.93</td>
<td>1.35</td>
</tr>
<tr>
<td>E</td>
<td>15.37</td>
<td>15.62</td>
<td>15.87</td>
</tr>
<tr>
<td>E1</td>
<td>12.81</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>E2</td>
<td>4.96</td>
<td>5.08</td>
<td>5.20</td>
</tr>
<tr>
<td>e</td>
<td>~</td>
<td>5.56</td>
<td>~</td>
</tr>
<tr>
<td>L</td>
<td>15.75</td>
<td>16.00</td>
<td>16.25</td>
</tr>
<tr>
<td>L1</td>
<td>3.69</td>
<td>3.81</td>
<td>3.93</td>
</tr>
<tr>
<td>P</td>
<td>3.51</td>
<td>3.58</td>
<td>3.65</td>
</tr>
<tr>
<td>P1</td>
<td>6.60</td>
<td>6.80</td>
<td>7.00</td>
</tr>
<tr>
<td>Q</td>
<td>5.34</td>
<td>5.46</td>
<td>5.58</td>
</tr>
<tr>
<td>S</td>
<td>5.34</td>
<td>5.46</td>
<td>5.58</td>
</tr>
</tbody>
</table>

© Semiconductor Components Industries, LLC, 2018 www.onsemi.com