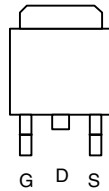


N-Channel 75 V (D-S) MOSFET

PRODUCT SUMMARY

| V _{DS} (V) | R _{DS(on)} (Ω) | I _D (A) | Q _g (Typ.) |
|---------------------|---------------------------------|--------------------|-----------------------|
| 75 | 0.007 at V _{GS} = 10 V | 110 ^d | 69 |

TO-263


Top View

Ordering Information: SUM110N08-07P-E3 (Lead (Pb)-free)

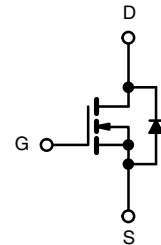
FEATURES

- TrenchFET[®] Power MOSFETS
- 100 % R_g and UIS Tested
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

APPLICATIONS

- Synchronous Rectification



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|--|-----------------------------------|-------------------------------------|--------------------|
| Drain-Source Voltage | V _{DS} | 75 | V |
| Gate-Source Voltage | V _{GS} | ± 20 | |
| Continuous Drain Current (T _J = 150 °C) | I _D | T _C = 25 °C | 110 ^d |
| | | T _C = 70 °C | 103 |
| Pulsed Drain Current | I _{DM} | 180 | A |
| Avalanche Current | I _{AS} | 50 | |
| Single Avalanche Energy ^a | E _{AS} | 125 | mJ |
| Maximum Power Dissipation ^a | P _D | T _C = 25 °C | 208.3 ^b |
| | | T _A = 25 °C ^c | 3.75 |
| Operating Junction and Storage Temperature Range | T _J , T _{stg} | - 55 to 150 | °C |

THERMAL RESISTANCE RATINGS

| Parameter | Symbol | Limit | Unit |
|--|-------------------|-------|------|
| Junction-to-Ambient (PCB Mount) ^c | R _{thJA} | 40 | °C/W |
| Junction-to-Case (Drain) | R _{thJC} | 0.6 | |

Notes:

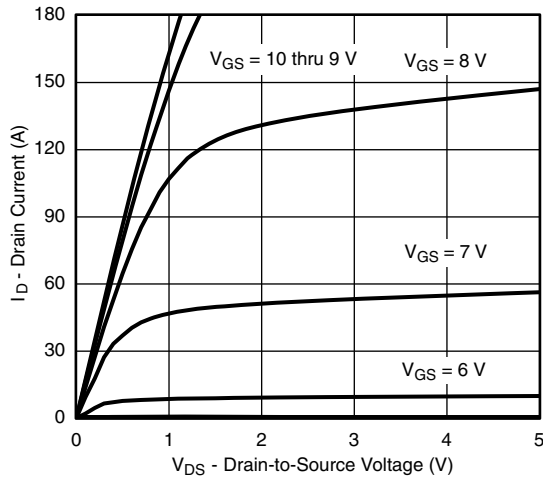
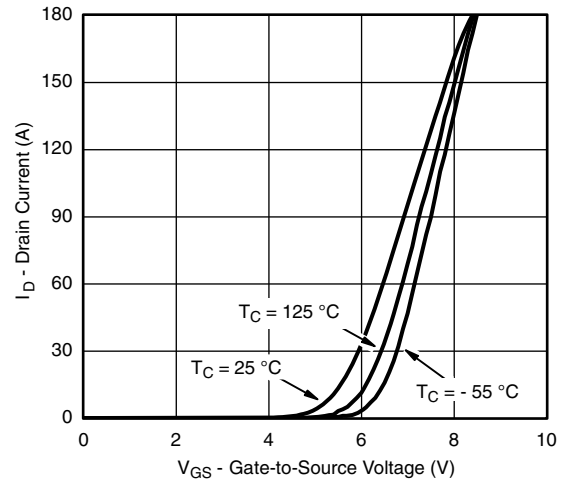
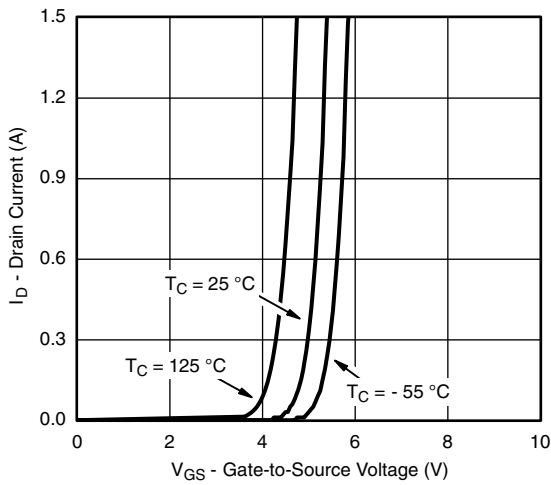
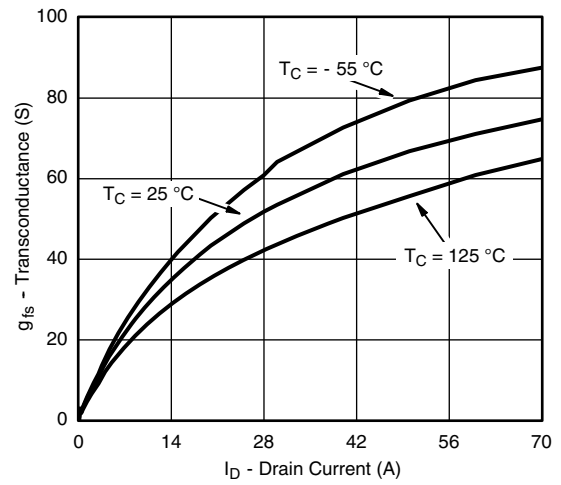
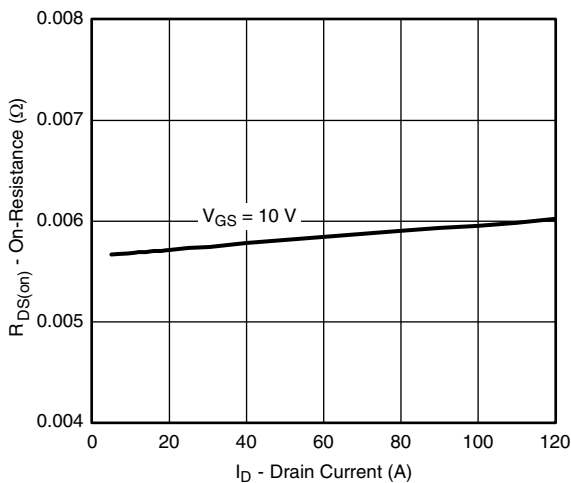
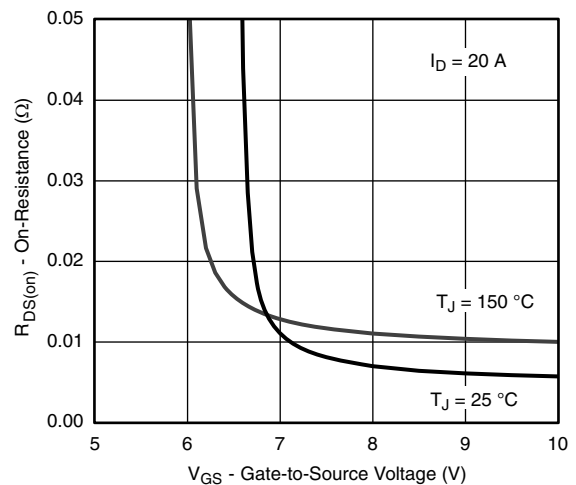
- Duty cycle ≤ 1 %.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).
- Package limited.

| SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted) | | | | | | |
|---|---------------|--|------|--------|-----------|---------------|
| Parameter | Symbol | Test Conditions | Min. | Typ. | Max. | Unit |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V_{DS} | $V_{DS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$ | 75 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$ | 2.5 | | 4.5 | |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ | | | ± 250 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}$ | | | 1 | μA |
| | | $V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$ | | | 50 | |
| | | $V_{DS} = 75\text{ V}, V_{GS} = 0\text{ V}, T_J = 150\text{ }^\circ\text{C}$ | | | 250 | |
| On-State Drain Current ^a | $I_{D(on)}$ | $V_{DS} \geq 10\text{ V}, V_{GS} = 10\text{ V}$ | 70 | | | A |
| Drain-Source On-State Resistance ^a | $R_{DS(on)}$ | $V_{GS} = 10\text{ V}, I_D = 20\text{ A}$ | | 0.0057 | 0.0070 | Ω |
| | | $V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 125\text{ }^\circ\text{C}$ | | 0.0092 | 0.0112 | |
| Forward Transconductance ^a | g_{fs} | $V_{DS} = 15\text{ V}, I_D = 20\text{ A}$ | | 43 | | S |
| Dynamic^b | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 30\text{ V}, f = 1\text{ MHz}$ | | 4250 | | pF |
| Output Capacitance | C_{oss} | | | 580 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 230 | | |
| Total Gate Charge ^c | Q_g | $V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 50\text{ A}$ | | 69 | 105 | nC |
| Gate-Source Charge ^c | Q_{gs} | | | 23 | | |
| Gate-Drain Charge ^c | Q_{gd} | | | 21 | | |
| Gate Resistance | R_g | $f = 1\text{ MHz}$ | | 1.2 | 2.4 | Ω |
| Turn-On Delay Time ^c | $t_{d(on)}$ | $V_{DD} = 30\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong 50\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$ | | 17 | 30 | ns |
| Rise Time ^c | t_r | | | 5 | 10 | |
| Turn-Off Delay Time ^c | $t_{d(off)}$ | | | 22 | 40 | |
| Fall Time ^c | t_f | | | 6 | 15 | |
| Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^\circ\text{C}$ ^b | | | | | | |
| Continuous Current | I_S | | | | 110 | A |
| Pulsed Current | I_{SM} | | | | 180 | |
| Forward Voltage ^a | V_{SD} | $I_F = 20\text{ A}, V_{GS} = 0\text{ V}$ | | 0.83 | 1.5 | V |
| Reverse Recovery Time | t_{rr} | $I_F = 75\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$ | | 65 | 100 | ns |
| Peak Reverse Recovery Current | $I_{RM(REC)}$ | | | 2.5 | 5 | A |
| Reverse Recovery Charge | Q_{rr} | | | | 85 | 150 |

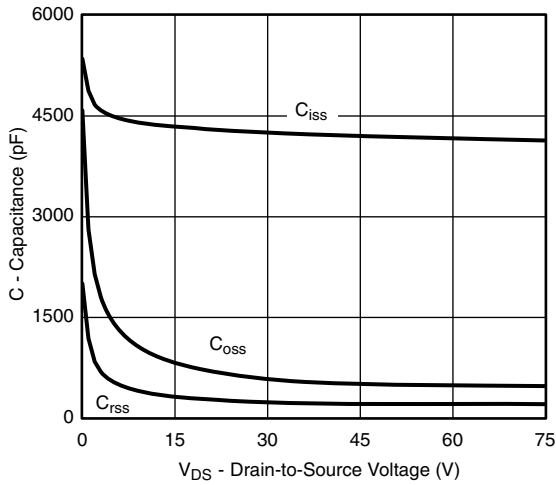
Notes:

- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

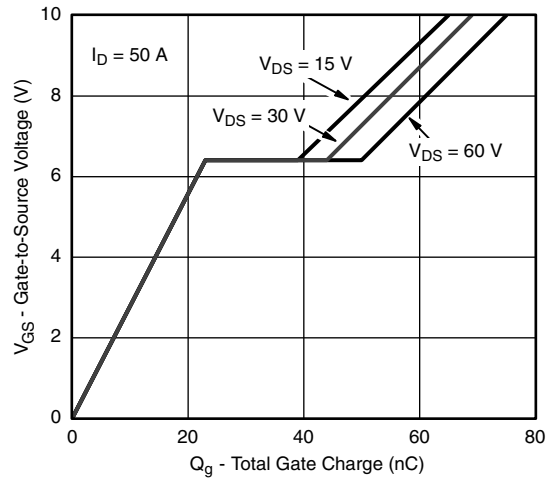
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Output Characteristics

Transfer Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

On-Resistance vs. Gate-to-Source Voltage

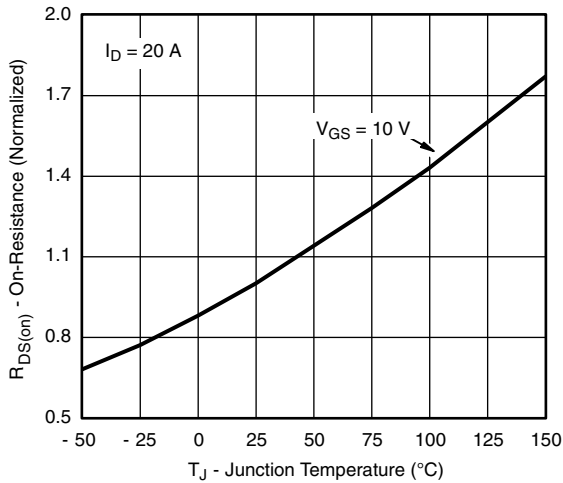
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



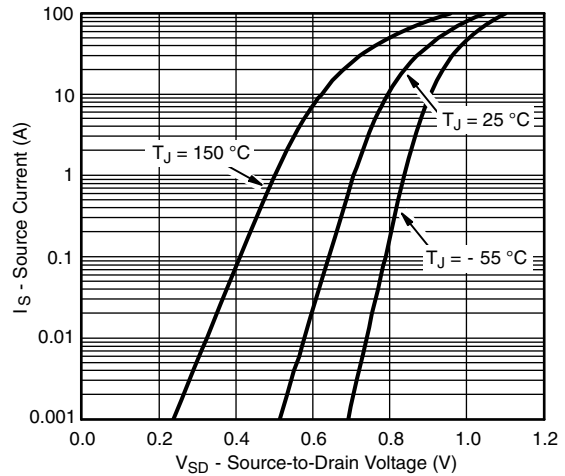
Capacitance



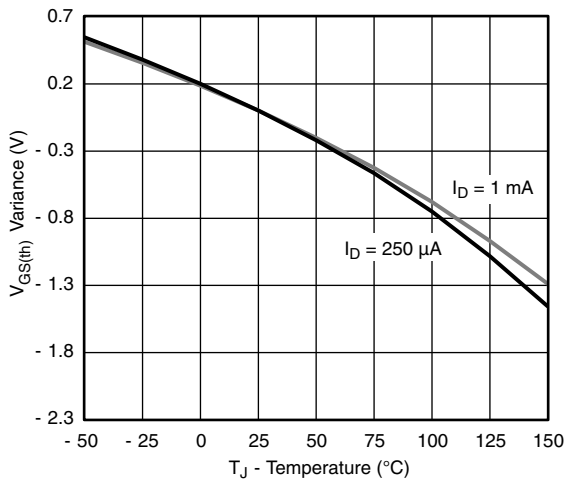
Gate Charge



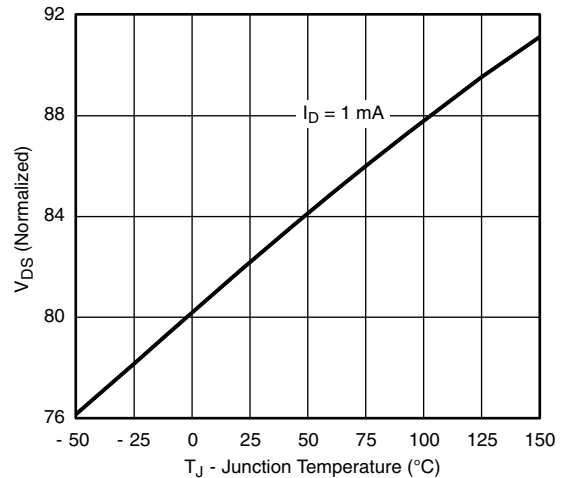
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

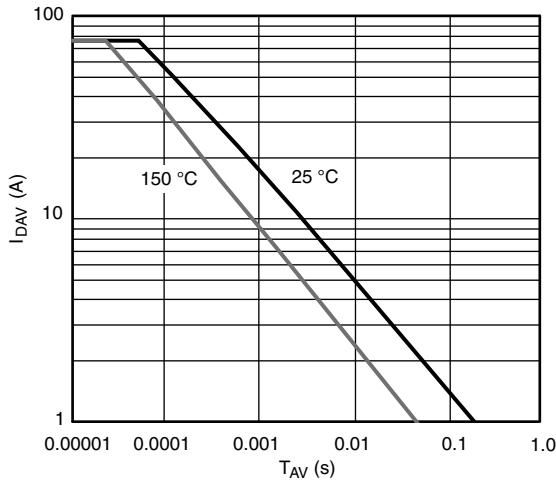


Threshold Voltage

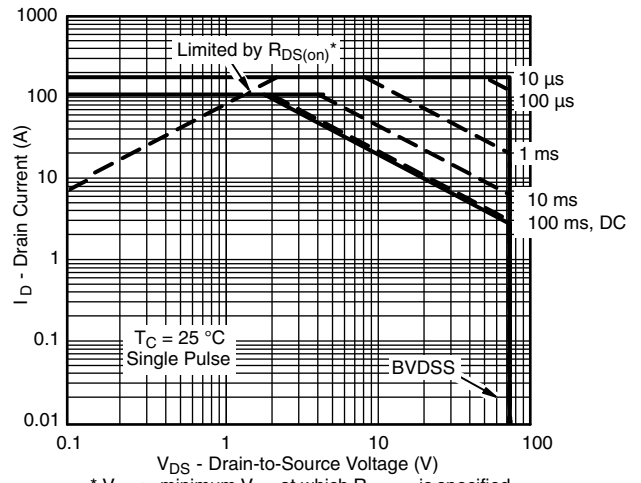


Drain Source Breakdown vs. Junction Temperature

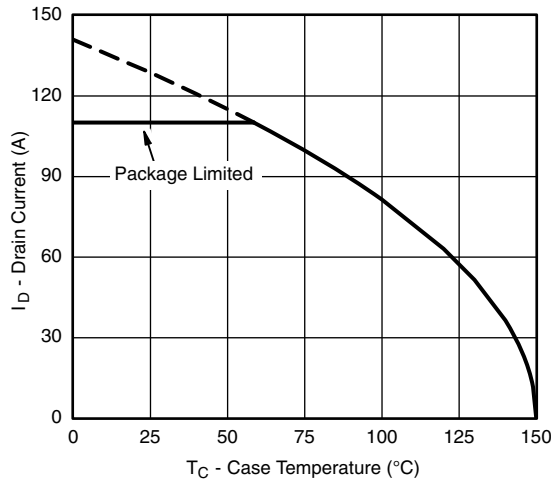
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Single Pulse Avalanche Current Capability vs. Time

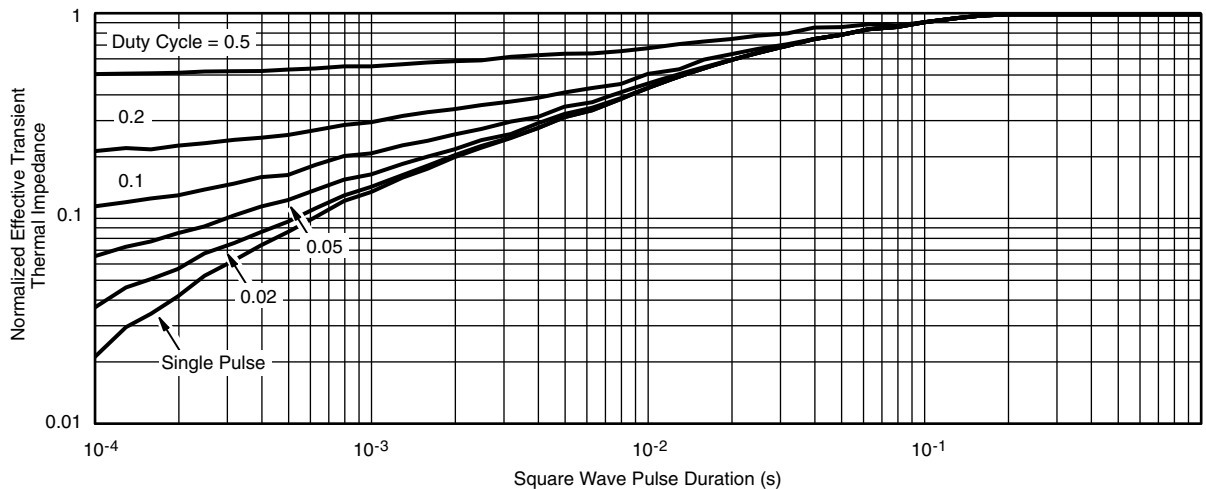


Safe Operating Area, Junction-to-Case
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



Current Derating*, Junction-to-Case

* The power dissipation P_D is based on $T_{J(max)} = 150\text{ °C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



Normalized Thermal Transient Impedance, Junction-to-Case

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TO-263 (D²PAK): 3-LEAD



| DIM. | INCHES | | MILLIMETERS | | |
|---------------------------------|------------|-------|-------------|--------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 0.160 | 0.190 | 4.064 | 4.826 | |
| b | 0.020 | 0.039 | 0.508 | 0.990 | |
| b1 | 0.020 | 0.035 | 0.508 | 0.889 | |
| b2 | 0.045 | 0.055 | 1.143 | 1.397 | |
| c* | Thin lead | 0.013 | 0.018 | 0.330 | 0.457 |
| | Thick lead | 0.023 | 0.028 | 0.584 | 0.711 |
| c1 | Thin lead | 0.013 | 0.017 | 0.330 | 0.431 |
| | Thick lead | 0.023 | 0.027 | 0.584 | 0.685 |
| c2 | 0.045 | 0.055 | 1.143 | 1.397 | |
| D | 0.340 | 0.380 | 8.636 | 9.652 | |
| D1 | 0.220 | 0.240 | 5.588 | 6.096 | |
| D2 | 0.038 | 0.042 | 0.965 | 1.067 | |
| D3 | 0.045 | 0.055 | 1.143 | 1.397 | |
| E | 0.380 | 0.410 | 9.652 | 10.414 | |
| E1 | 0.245 | - | 6.223 | - | |
| E2 | 0.355 | 0.375 | 9.017 | 9.525 | |
| E3 | 0.072 | 0.078 | 1.829 | 1.981 | |
| e | 0.100 BSC | | 2.54 BSC | | |
| K | 0.045 | 0.055 | 1.143 | 1.397 | |
| L | 0.575 | 0.625 | 14.605 | 15.875 | |
| L1 | 0.090 | 0.110 | 2.286 | 2.794 | |
| L2 | 0.040 | 0.055 | 1.016 | 1.397 | |
| L3 | 0.050 | 0.070 | 1.270 | 1.778 | |
| L4 | 0.010 BSC | | 0.254 BSC | | |
| M | - | 0.002 | - | 0.050 | |
| ECN: T10-0738-Rev. J, 03-Jan-11 | | | | | |
| DWG: 5843 | | | | | |

Notes

- Plane B includes maximum features of heat sink tab and plastic.
- No more than 25 % of L1 can fall above seating plane by max. 8 mils.
- Pin-to-pin coplanarity max. 4 mils.
- *: Thin lead is for SUB, SYB.
Thick lead is for SUM, SYM, SQM.
- Use inches as the primary measurement.
- This feature is for thick lead.

RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)



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