P-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 100	0.082 at V_{GS} = - 10 V	- 30	70 nC
	0.092 at V_{GS} = - 4.5 V	- 25	

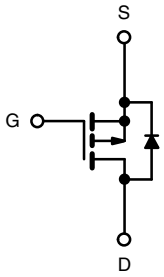
FEATURES

- Maximum 175 °C junction temperature
- 100 % R_g and UIS tested
- DT-TrenchPower MOSFET

RoHS COMPLIANT
HALOGEN FREE

TO-263

Top View



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	- 100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current (T_J = 150 °C)[b]	T_C = 25 °C	I_D	- 30	A
	T_C = 70 °C		- 26	
	T_A = 25 °C		- 10[b, c]	
	T_A = 70 °C		- 6.5[b, c]	
Pulsed Drain Current		I_{DM}	- 120	
Continuous Source Current (Diode Conduction)	T_C = 25 °C	I_S	- 30[a]	
	T_A = 25 °C		- 5.15[b, c]	
Avalanche Current	L = 0.1 mH	I_{AS}	- 28	
Single Pulse Avalanche Energy		E_{AS}	415	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	215	W
	T_C = 70 °C		159	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient[a]	t ≤ 10 s	R_{thJA}	18	22	°C/W
	Steady State		45	50	
Junction-to-Case (Drain)		R_{thJC}	0.59	1.2	

Notes:
a. Package limited.
b. Surface mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. Maximum under steady state conditions is 50 °C/W.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = - 250 µA	- 100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	I_D = - 250 µA		- 109		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			5.9		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1.5		- 3.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 100 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 80 V, V_{GS} = 0 V, T_J = 55 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ 5 V, V_{GS} = - 10 V	- 30			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 10 A		0.082	0.099	Ω
		V_{GS} = - 4.5 V, I_D = - 8 A		0.092	0.115	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 10 A		16		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = - 50 V, V_{GS} = 0 V, f = 1 MHz		5260		pF
Output Capacitance	C_{oss}			710		
Reverse Transfer Capacitance	C_{rss}			79		
Total Gate Charge	Q_g	V_{DS} = - 50 V, V_{GS} = - 10 V, I_D = - 10 A		70	100	nC
		V_{DS} = - 50 V, V_{GS} = - 4.5 V, I_D = - 8 A		33	50	
Gate-Source Charge	Q_{gs}			15		
Gate-Drain Charge	Q_{gd}			23		
Gate Resistance	R_g	f = 1 MHz		5		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = - 50 V, R_L = 6.5 Ω $I_D \cong$ - 10 A, V_{GEN} = - 10 V, R_g = 1 Ω		26		ns
Rise Time	t_r			70		
Turn-Off Delay Time	$t_{d(off)}$			45		
Fall Time	t_f			39		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			- 30	A
Pulse Diode Forward Current[a]	I_{SM}				- 120	
Body Diode Voltage	V_{SD}	I_S = - 10 A		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 10 A, dI/dt = 100 A/µs, T_J = 25 °C		60	90	ns
Body Diode Reverse Recovery Charge	Q_{rr}			150	215	nC
Reverse Recovery Fall Time	t_a			48		ns
Reverse Recovery Rise Time	t_b			15		

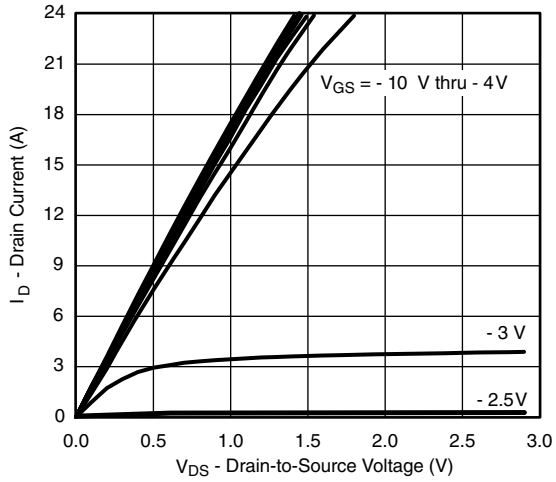
Notes:

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.

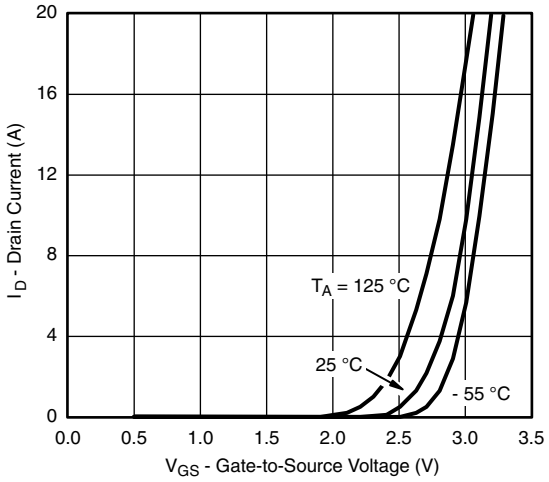
b. Guaranteed by design, not subject to production testing.

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.

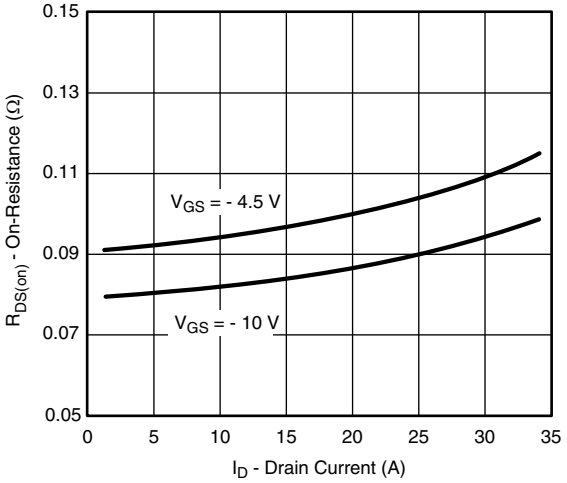
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



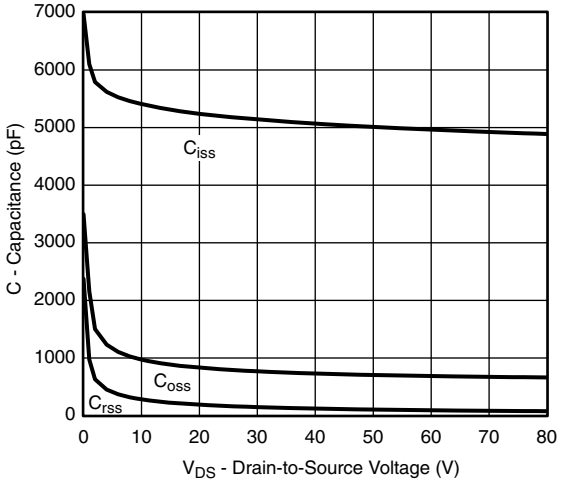
Output Characteristics



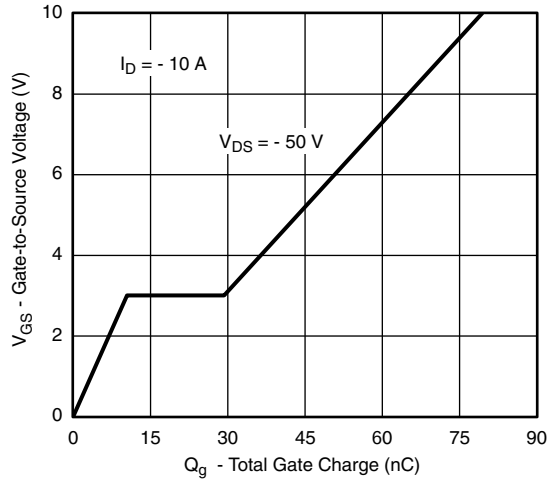
Transfer Characteristics



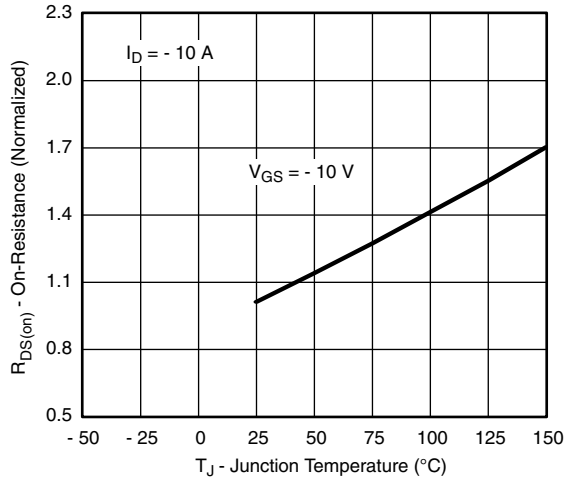
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

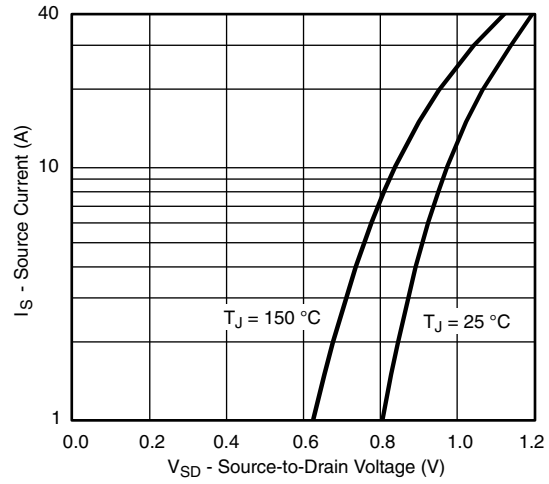


Gate Charge

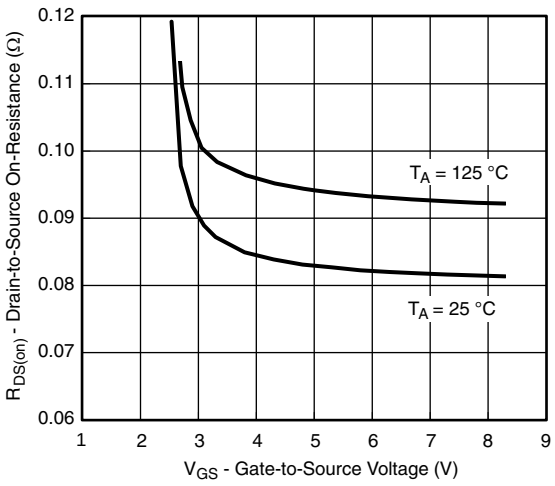


On-Resistance vs. Junction Temperature

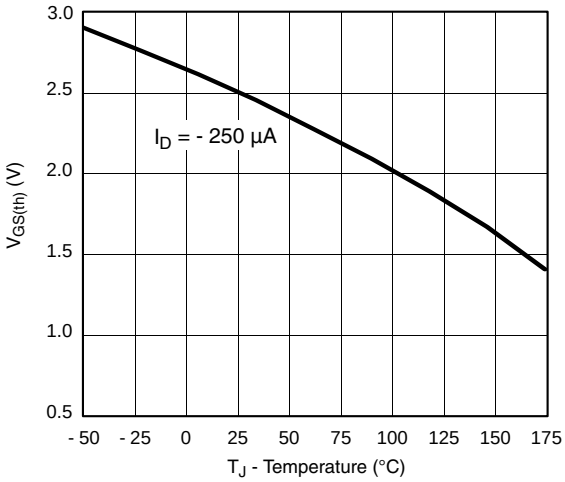
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



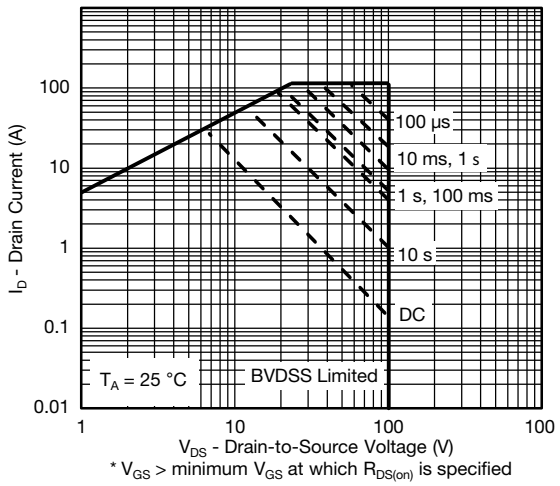
Source-Drain Diode Forward Voltage



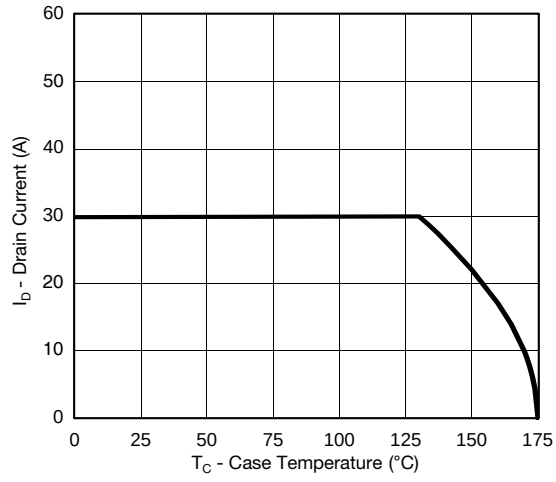
On-Resistance vs. Gate-to-Source Voltage



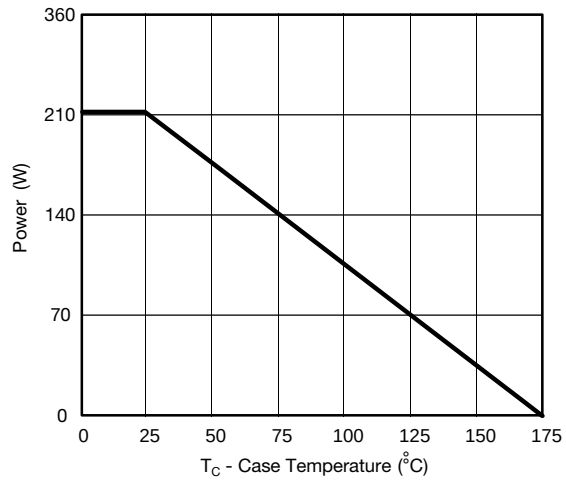
Threshold Voltage



Safe Operating Area, Junction-to-Ambient

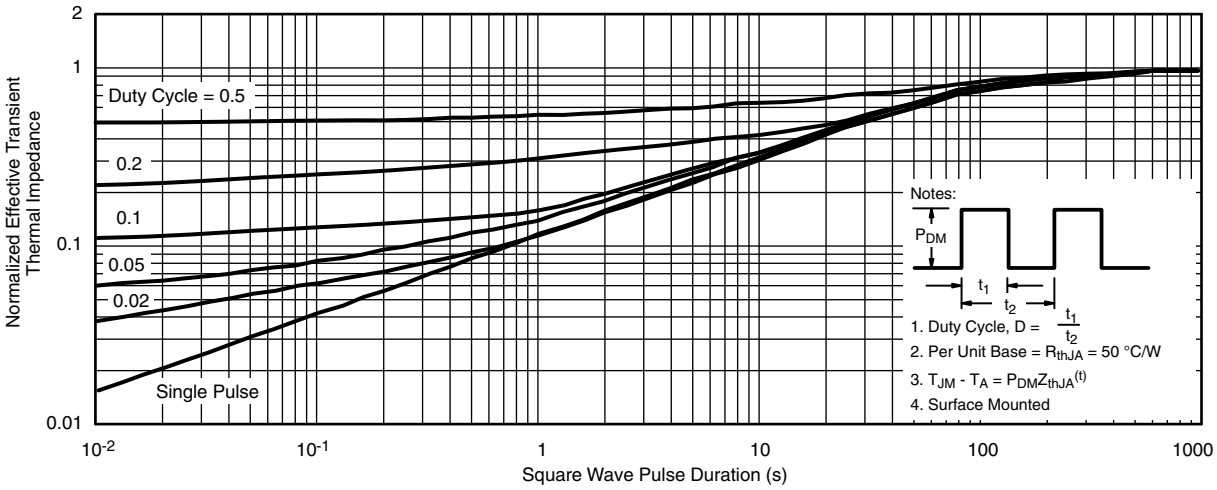


Current Derating*

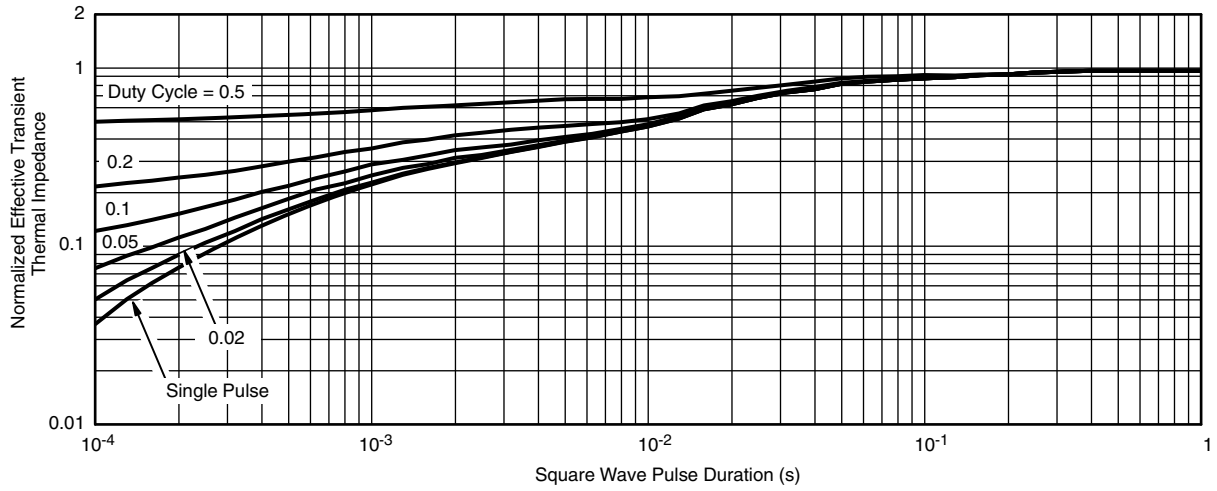


Single Pulse Power, Junction-to-Ambient

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

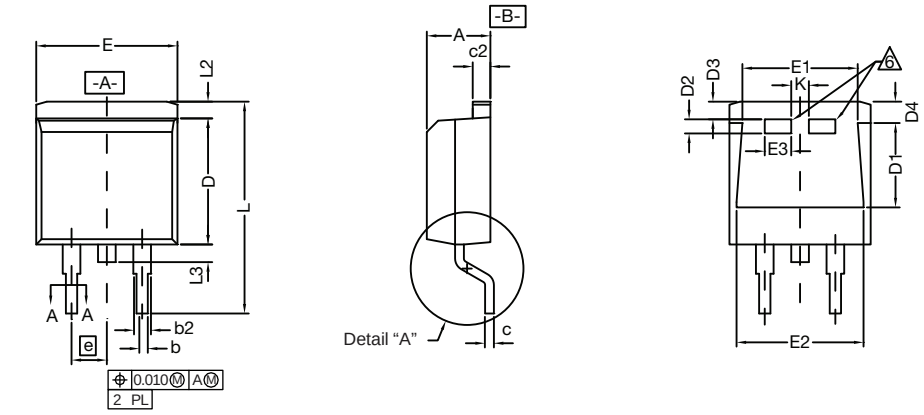


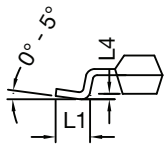
Normalized Thermal Transient Impedance, Junction-to-Ambient



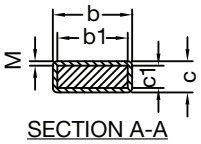
Normalized Thermal Transient Impedance, Junction-to-Case

TO-263 (D^2PAK): 3-LEAD





DETAIL A (ROTATED 90°)



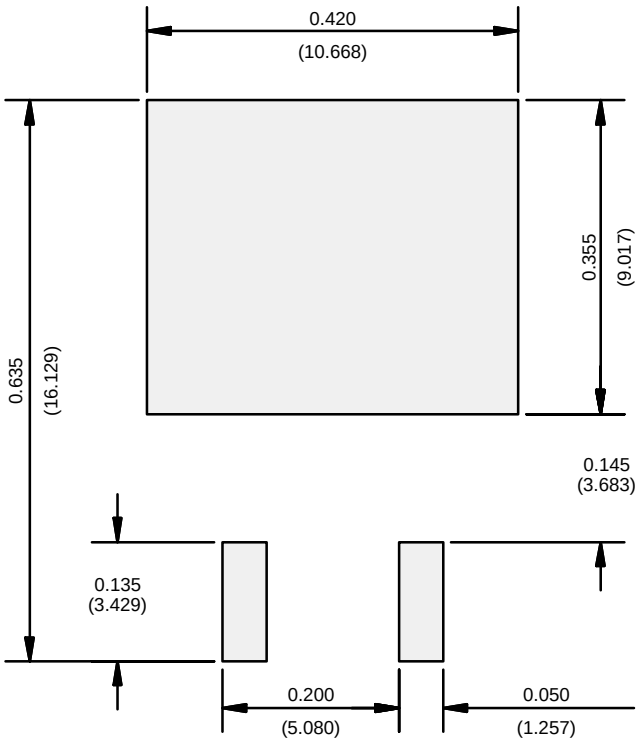
SECTION A-A

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
D4		0.044	0.052	1.118	1.321
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: T13-0707-Rev. K, 30-Sep-13 DWG: 5843					

Notes

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

RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

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