

UTT150N06-VB Datasheet

N-Channel 60 V (D-S) MOSFET

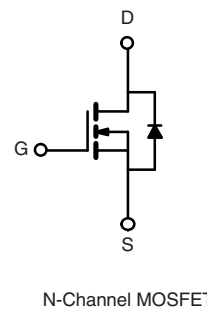
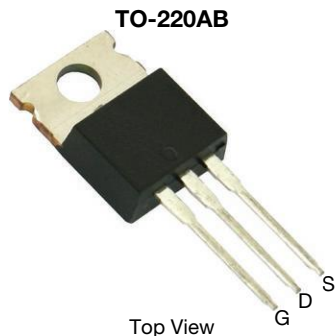
PRODUCT SUMMARY	
V _{DS} (V)	60
R _{DS(on)} (Ω) at V _{GS} = 10 V	0.0016
R _{DS(on)} (Ω) at V _{GS} = 4.5 V	0.0020
I _D (A)	270
Configuration	Single

FEATURES

- TrenchFET® power MOSFET
- Package with low thermal resistance
- 100 % R_g and UIS tested



RoHS
COMPLIANT
HALOGEN
FREE



ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V _{DS}	60	V
Gate-Source Voltage		V _{GS}	± 20	
Continuous Drain Current	T _C = 25 °C	I _D	270	A
	T _C = 125 °C		120 ^a	
Continuous Source Current (Diode Conduction)		I _S	120 ^a	
Pulsed Drain Current ^b		I _{DM}	600	
Single Pulse Avalanche Current	L = 0.1 mH	I _{AS}	75	
Single Pulse Avalanche Energy		E _{AS}	281	
Maximum Power Dissipation ^b	T _C = 25 °C	P _D	375	W
	T _C = 125 °C		125	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to +175	°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}	0.4	

Notes

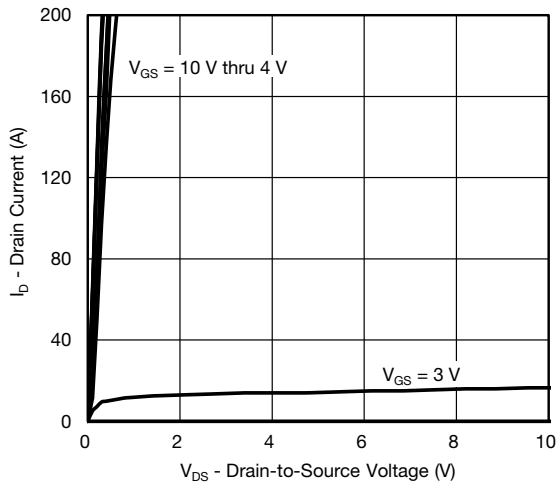
- Package limited.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR4 material).

SPECIFICATIONS ($T_C = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60	-	-	V
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.5	2.0	2.5	
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}$ $V_{DS} = 60\text{ V}$	-	-	1	μA
		$V_{GS} = 0\text{ V}$ $V_{DS} = 60\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	50	
		$V_{GS} = 0\text{ V}$ $V_{DS} = 60\text{ V}, T_J = 175\text{ }^\circ\text{C}$	-	-	1.5	mA
On-State Drain Current ^a	$I_{D(on)}$	$V_{GS} = 10\text{ V}$ $V_{DS} \geq 5\text{ V}$	120	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ $I_D = 30\text{ A}$	-	0.0016	-	Ω
		$V_{GS} = 10\text{ V}$ $I_D = 30\text{ A}, T_J = 125\text{ }^\circ\text{C}$	-	0.0031	-	
		$V_{GS} = 10\text{ V}$ $I_D = 30\text{ A}, T_J = 175\text{ }^\circ\text{C}$	-	0.0037	-	
		$V_{GS} = 4.5\text{ V}$ $I_D = 20\text{ A}$	-	0.0020	-	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 30\text{ A}$	-	164	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$ $V_{DS} = 25\text{ V}, f = 1\text{ MHz}$	-	12 060	15 100	pF
Output Capacitance	C_{oss}		-	5750	7200	
Reverse Transfer Capacitance	C_{rss}		-	860	1100	
Total Gate Charge ^c	Q_g	$V_{GS} = 10\text{ V}$ $V_{DS} = 30\text{ V}, I_D = 80\text{ A}$	-	128	200	nC
Gate-Source Charge ^c	Q_{gs}		-	33	-	
Gate-Drain Charge ^c	Q_{gd}		-	11	-	
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.8	1.68	2.6	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 0.375\text{ }\Omega$ $I_D \cong 80\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$	-	20	25	ns
Rise Time ^c	t_r		-	15	40	
Turn-Off Delay Time ^c	$t_{d(off)}$		-	65	100	
Fall Time ^c	t_f		-	12	20	
Source-Drain Diode Ratings and Characteristics ^b						
Pulsed Current ^a	I_{SM}		-	-	300	A
Forward Voltage	V_{SD}	$I_F = 80\text{ A}, V_{GS} = 0\text{ V}$	-	0.88	1.5	V

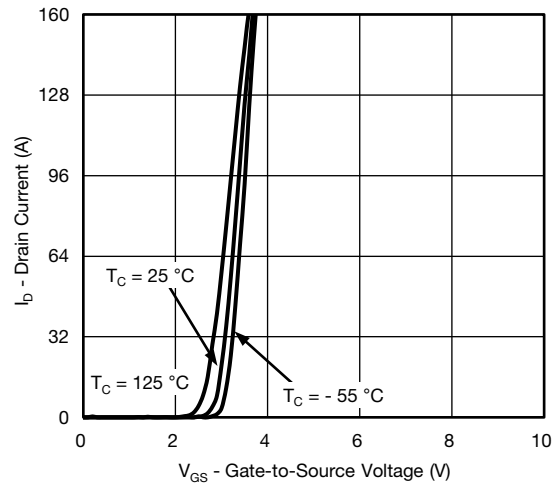
Notes

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

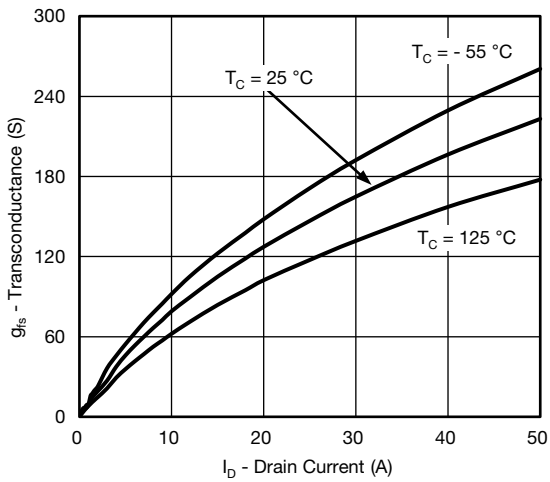
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



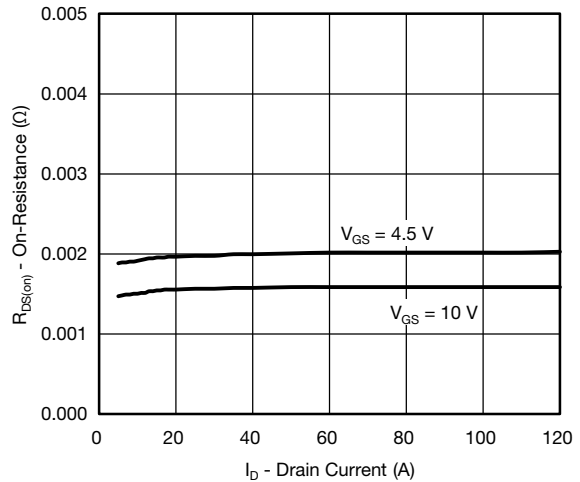
Output Characteristics



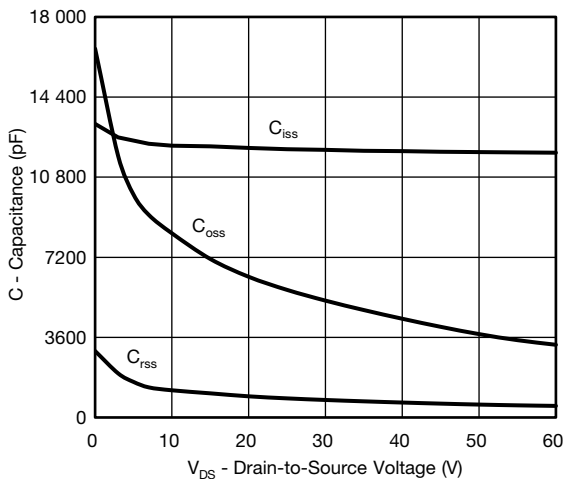
Transfer Characteristics



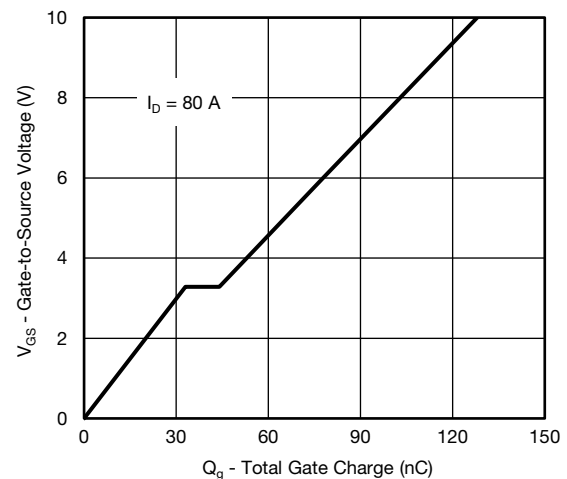
Transconductance



On-Resistance vs. Drain Current

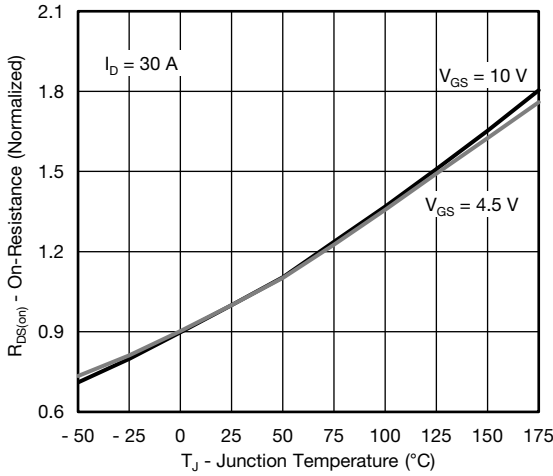


Capacitance

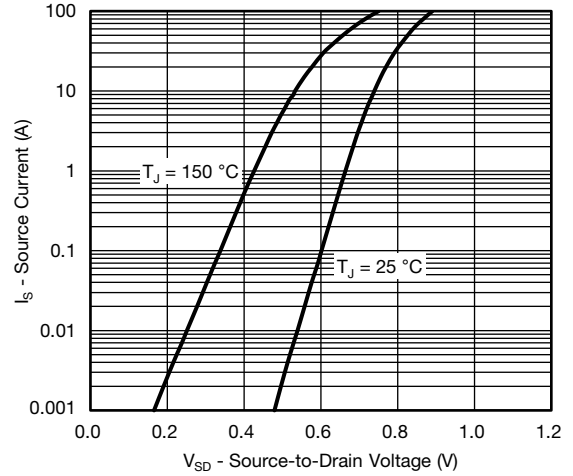


Gate Charge

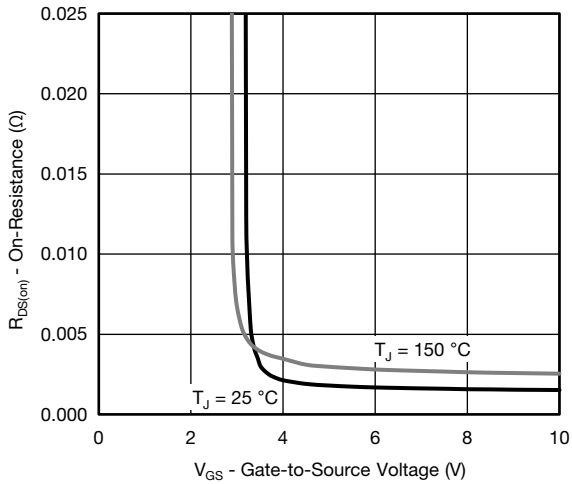
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



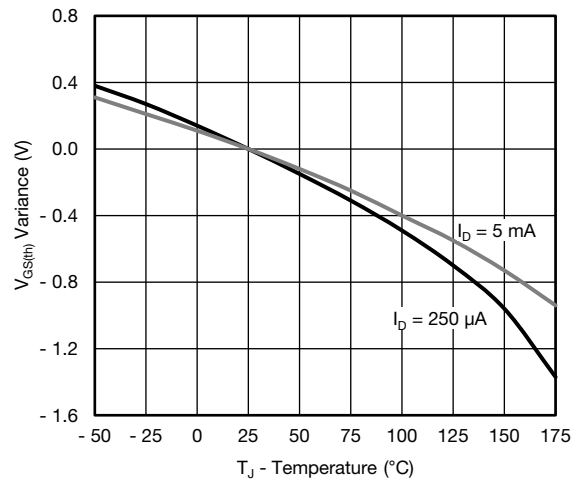
On-Resistance vs. Junction Temperature



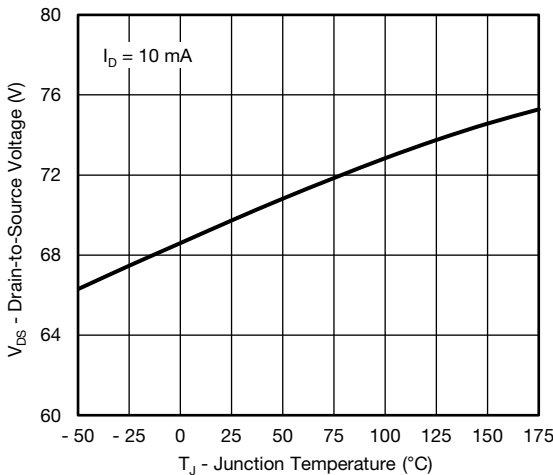
Source Drain Diode Forward Voltage



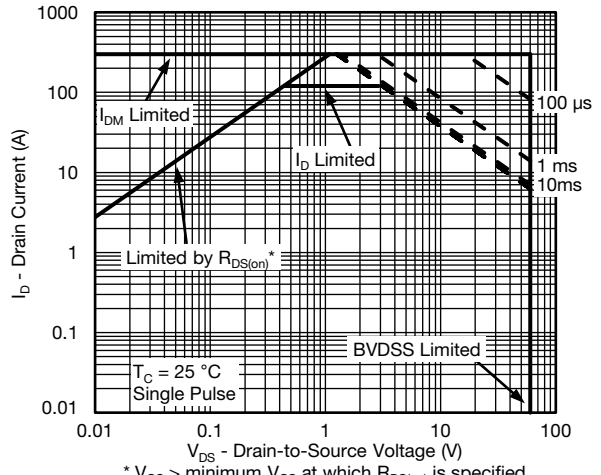
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

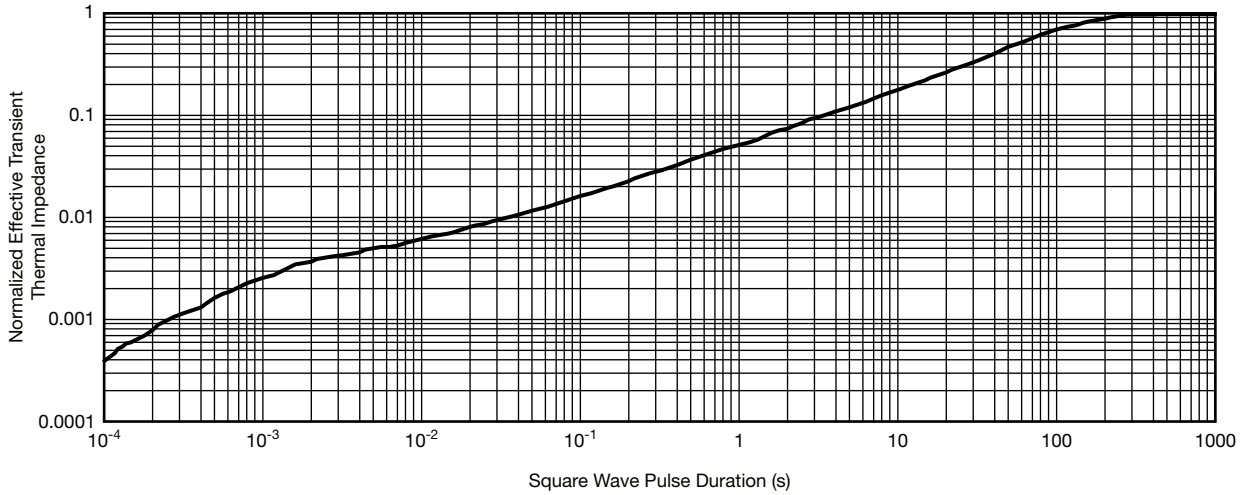


Drain Source Breakdown vs. Junction Temperature

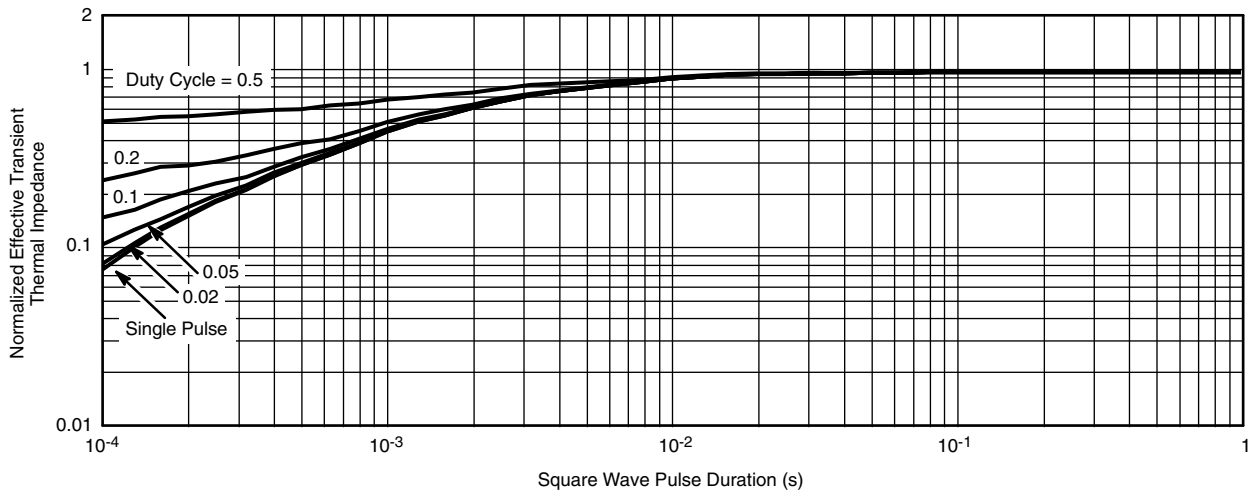


Safe Operating Area

THERMAL RATINGS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient

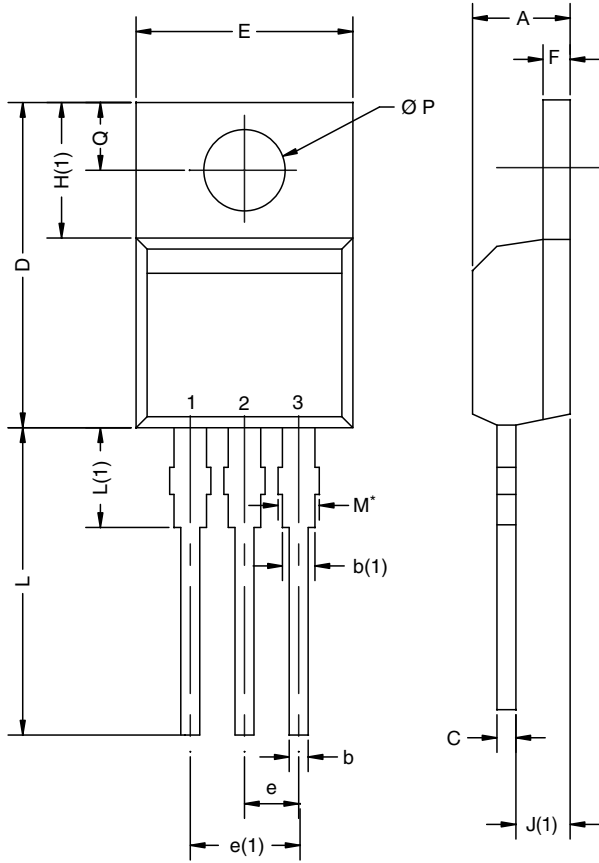


Normalized Thermal Transient Impedance, Junction-to-Case

Note

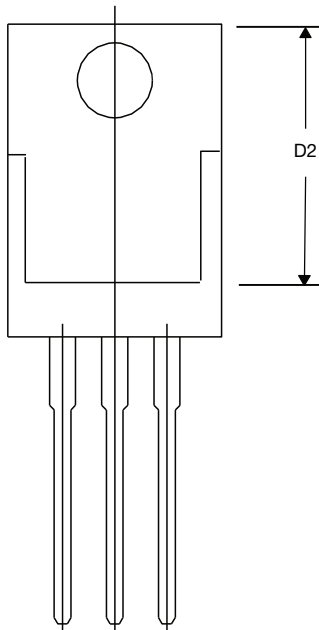
- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^\circ\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Case ($25\text{ }^\circ\text{C}$)
- are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

TO-220AB




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
	Thick lead	0.023	0.028	0.584
c1	Thin lead	0.013	0.017	0.330
	Thick lead	0.023	0.027	0.584
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

- 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.

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