

P-Channel 150 V (D-S) 175 °C MOSFET

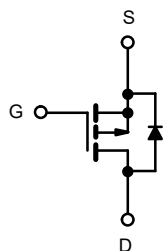
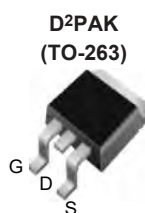
PRODUCT SUMMARY	
V_{DS} (V)	- 150
$R_{DS(on)}$ (Ω) at $V_{GS} = - 10$ V	0.065
$R_{DS(on)}$ (Ω) at $V_{GS} = - 4.5$ V	0.070
I_D (A)	- 40
Configuration	Single

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- Package with Low Thermal Resistance
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	- 150	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current	$T_C = 25$ °C	I_D	- 40	A
	$T_C = 125$ °C		- 25	
Continuous Source Current (Diode Conduction) ^a		I_S	- 25	
Pulsed Drain Current ^b		I_{DM}	- 55	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	- 22	
Single Pulse Avalanche Energy		E_{AS}	103	mJ
Maximum Power Dissipation ^b	$T_C = 25$ °C	P_D	75	W
	$T_C = 125$ °C		37	
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}	50	°C/W
Junction-to-Case (Drain)		R_{thJC}	1.1	

Notes

- Package limited.
- Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.

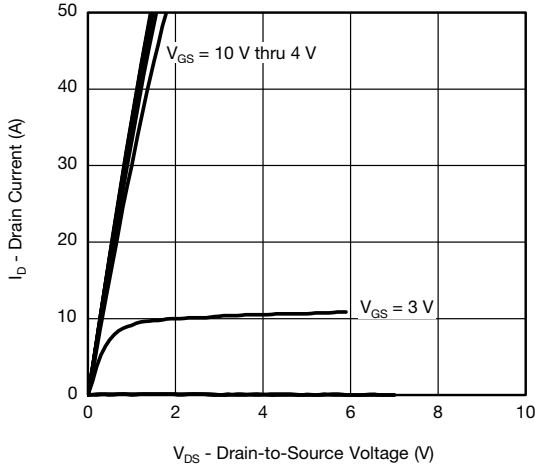
SPECIFICATIONS (T _C = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA		- 150	-	-	V
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA		- 1.0	-	-3.5	
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{GS} = 0 V	V _{DS} = - 100 V	-	-	- 1	μA
		V _{GS} = 0 V	V _{DS} = - 100 V, T _J = 125 °C	-	-	- 50	
		V _{GS} = 0 V	V _{DS} = - 100 V, T _J = 175 °C	-	-	- 250	
On-State Drain Current ^a	I _{D(on)}	V _{GS} = - 10 V	V _{DS} ≤ - 5 V	- 30	-	-	A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V	I _D = - 9 A	-	0.065	-	Ω
		V _{GS} = - 10 V	I _D = - 9 A, T _J = 125 °C	-	0.088	-	
		V _{GS} = - 10 V	I _D = - 9 A, T _J = 175 °C	-	-	0.113	
		V _{GS} = - 4.5 V	I _D = - 7.7 A	-	0.07	-	
Forward Transconductance ^b	g _{fs}	V _{DS} = - 15 V, I _D = - 9.2 A		-	35	-	S
Dynamic^b							
Input Capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = - 25 V, f = 1 MHz	-	5000	-	pF
Output Capacitance	C _{oss}			-	301	380	
Reverse Transfer Capacitance	C _{rss}			-	208	260	
Total Gate Charge ^c	Q _g	V _{GS} = - 10 V	V _{DS} = - 50V, I _D = - 9.2 A	-	96	144	nC
Gate-Source Charge ^c	Q _{gs}			-	8.4	-	
Gate-Drain Charge ^c	Q _{gd}			-	23.5	-	
Gate Resistance	R _g	f = 1 MHz		1.5	3.13	4.7	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = - 50 V, R _L = 6.49 Ω I _D ≅ - 7.7 A, V _{GEN} = - 10 V, R _g = 1.0 Ω		-	11	17	ns
Rise Time ^c	t _r			-	11	17	
Turn-Off Delay Time ^c	t _{d(off)}			-	78	117	
Fall Time ^c	t _f			-	15	23	
Source-Drain Diode Ratings and Characteristics^b							
Pulsed Current ^a	I _{SM}			-	-	- 50	A
Forward Voltage	V _{SD}	I _F = - 7.7 A, V _{GS} = 0 V		-	- 0.8	- 1.5	V

Notes

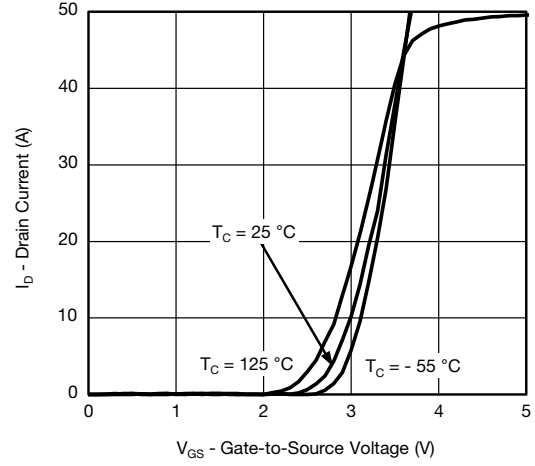
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

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.

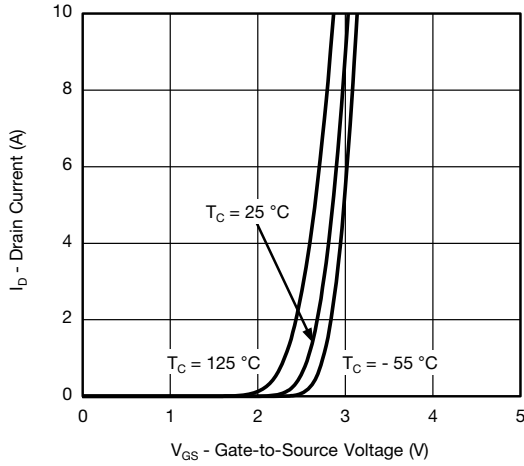
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



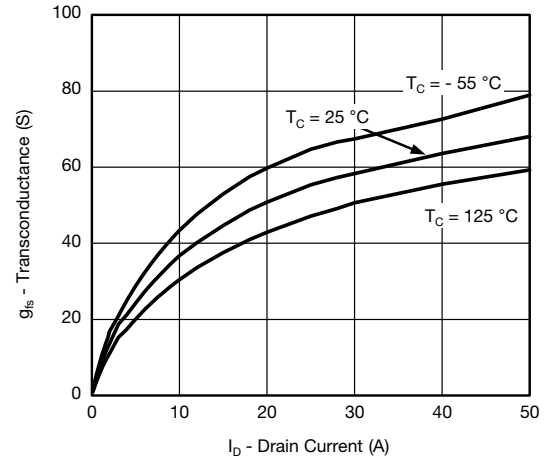
Output Characteristics



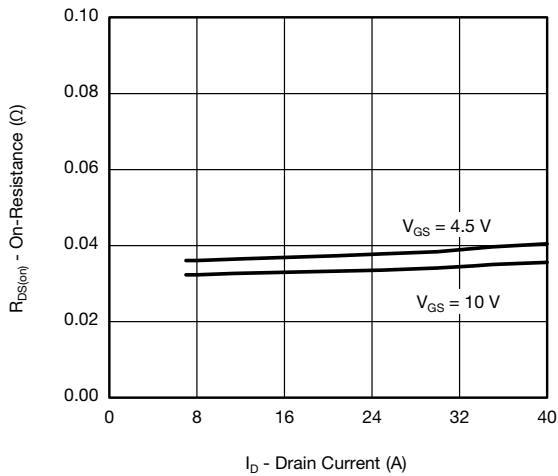
Transfer Characteristics



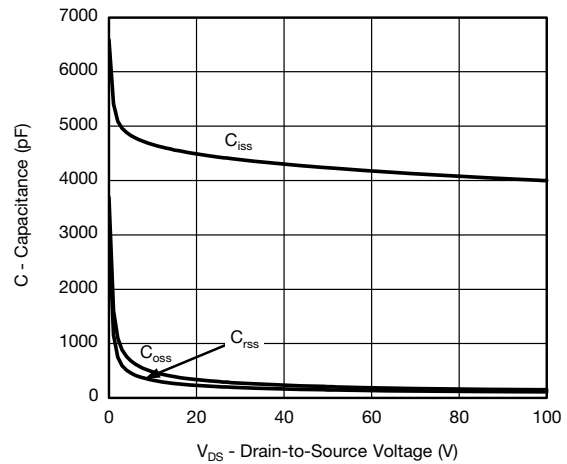
Transfer Characteristics



Transconductance

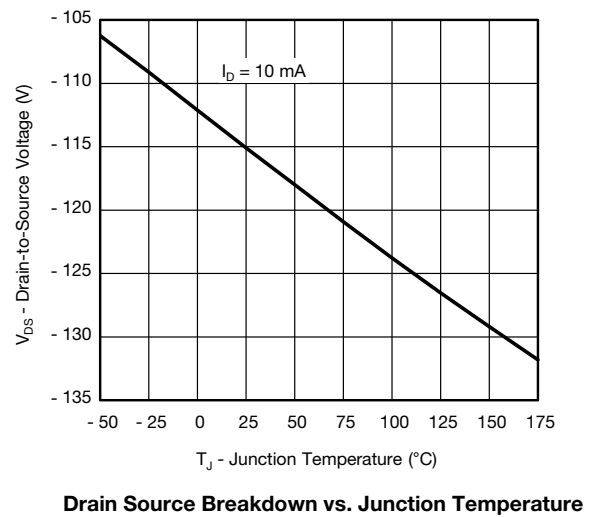
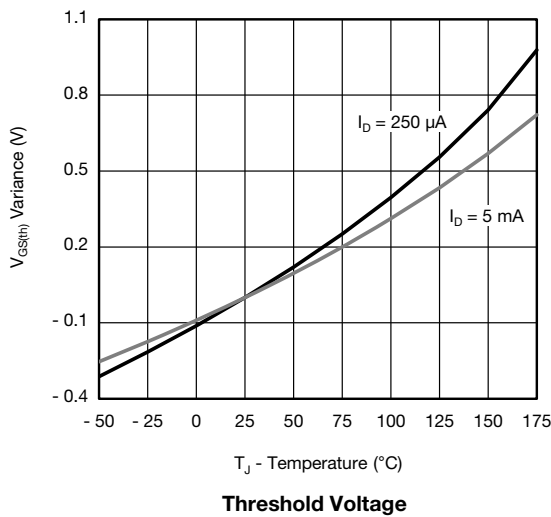
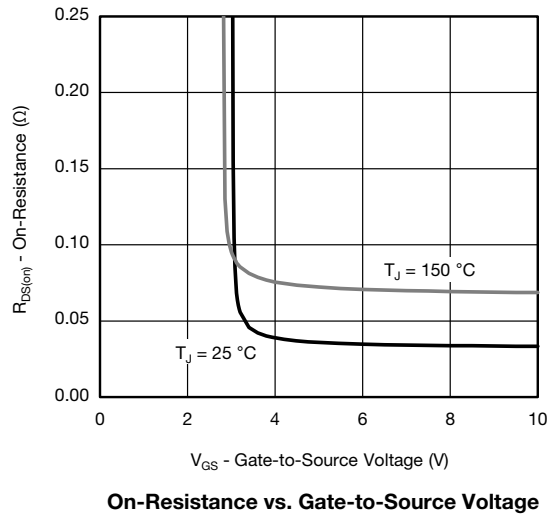
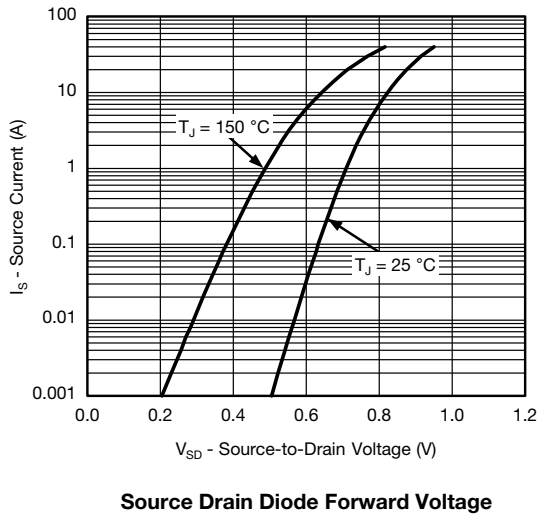
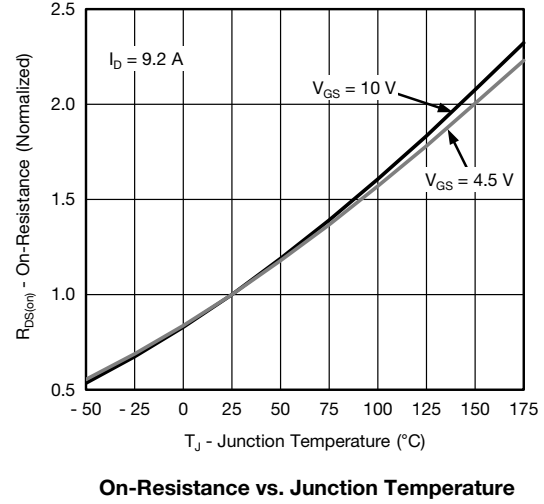
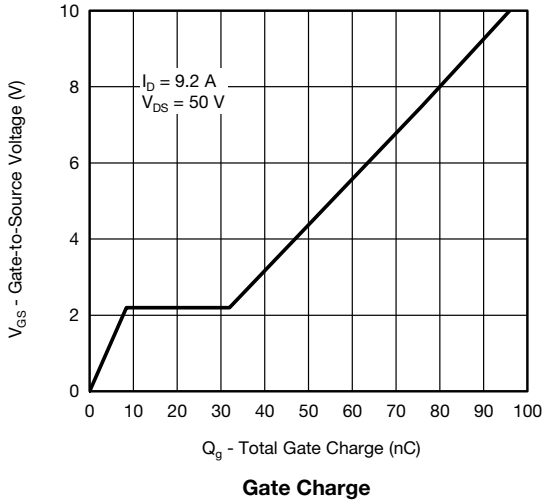


On-Resistance vs. Drain Current

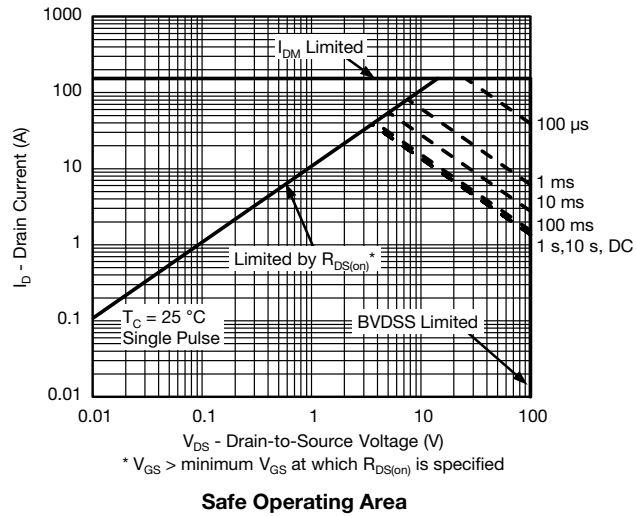


Capacitance

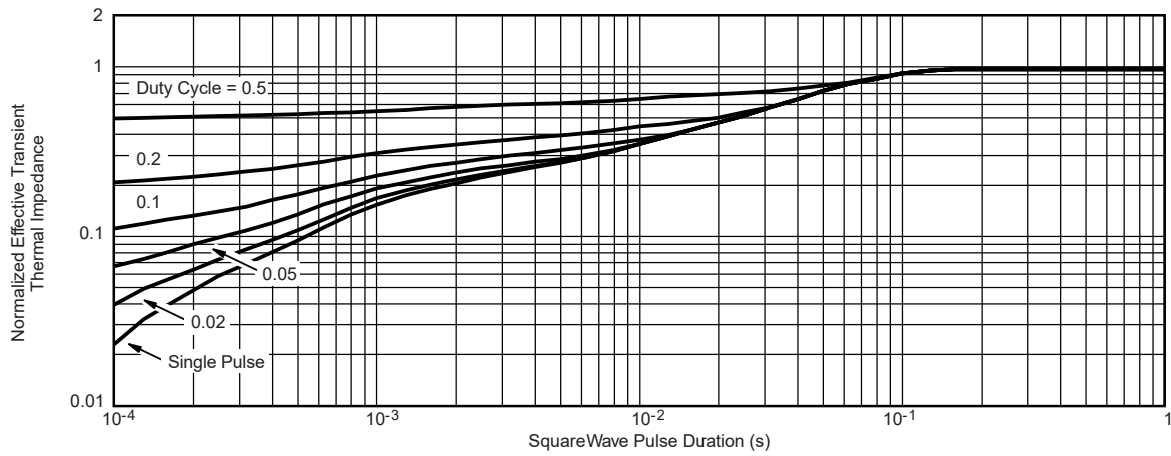
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



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

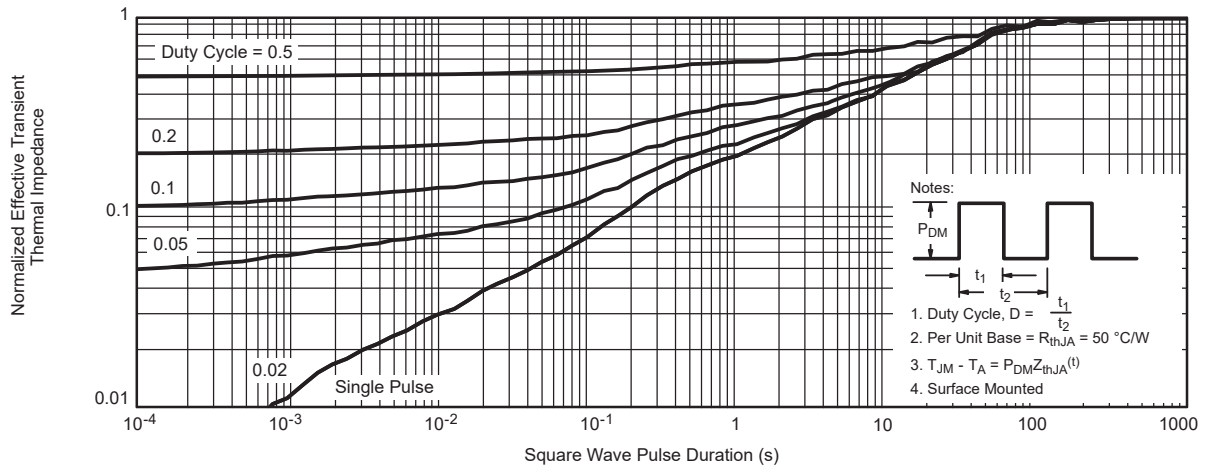


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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

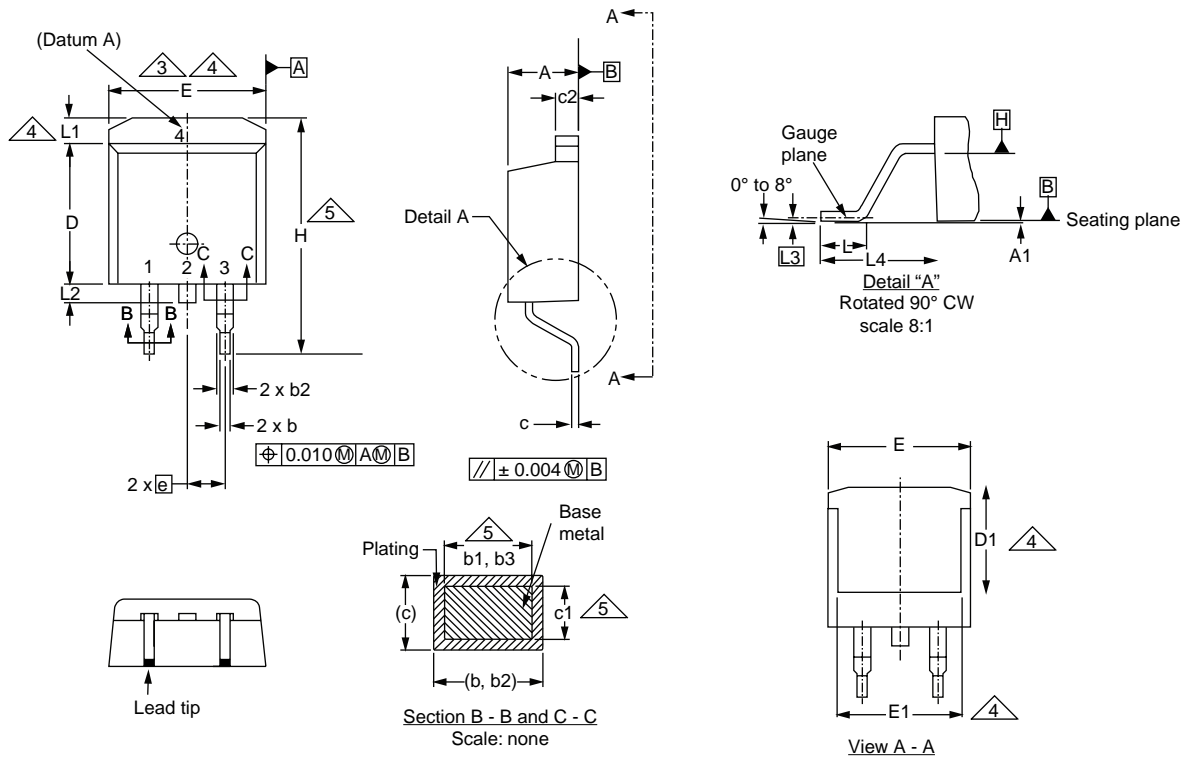


Normalized Thermal Transient Impedance, Junction-to-Ambient

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-263AB



DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b1	0.51	0.89	0.020	0.035
b2	1.14	1.78	0.045	0.070
b3	1.14	1.73	0.045	0.068
c	0.38	0.74	0.015	0.029
c1	0.38	0.58	0.015	0.023
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
D1	6.86	-	0.270	-
E	9.65	10.67	0.380	0.420
E1	6.22	-	0.245	-
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.65	-	0.066
L2	-	1.78	-	0.070
L3	0.25 BSC		0.010 BSC	
L4	4.78	5.28	0.188	0.208

ECN: S-82110-Rev. A, 15-Sep-08
DWG: 5970

Notes

1. Dimensioning and tolerancing per ASME Y14.5M-1994.
2. Dimensions are shown in millimeters (inches).
3. Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body at datum A.
4. Thermal PAD contour optional within dimension E, L1, D1 and E1.
5. Dimension b1 and c1 apply to base metal only.
6. Datum A and B to be determined at datum plane H.
7. Outline conforms to JEDEC outline to TO-263AB.

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