N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)[a]	Q_g (Typ)
100	0.026 at V_{GS} = 10 V	35	31 nC

FEATURES

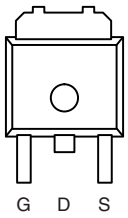
- TrenchFET® Power MOSFET
- 100 % UIS Tested

RoHS COMPLIANT

APPLICATIONS

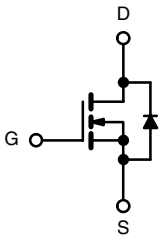
- Primary Side Switch

TO-252



Top View

Drain Connected to Tab



N-Channel MOSFET

Ordering Information: SUD35N10-26P-E3 (Lead (Pb)-free)

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 = 175 °C)	T_C = 25 °C	I_D	35	A
	T_C = 70 °C		32	
	T_A = 25 °C		12[b, c]	
	T_A = 70 °C		10[b, c]	
Pulsed Drain Current		I_{DM}	40	
Continuous Source-Drain Diode Current	T_C = 25 °C	I_S	50[e]	
	T_A = 25 °C		6.9[b, c]	
Avalanche Current Pulse	L = 0.1 mH	I_{AS}	33	
Single Pulse Avalanche Energy		E_{AS}	55	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	83	W
	T_C = 70 °C		58	
	T_A = 25 °C		8.3[b, c]	
	T_A = 70 °C		5.8[b, c]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Maximum Junction-to-Ambient[b, d]	t ≤ 10 s	R_{thJA}	15	18	°C/W
Maximum Junction-to-Case	Steady State	R_{thJC}	1.5	1.8	

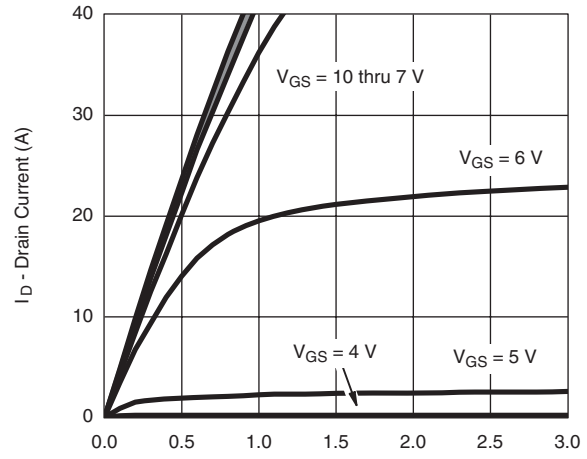
Notes:
a. Based on T_C = 25 °C.
b. Surface Mounted on 1" x 1" FR4 board.
c. t = 10 s.
d. Maximum under Steady State conditions is 50 °C/W.
e. Calculated based on maximum junction temperature. Package limitation current is 50 A.

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		165		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 11		
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	2.5		4.4	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} = 100 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	40			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 12 A		0.021	0.026	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 12 A		25		S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{DS} = 12 V, V_{GS} = 0 V, f = 1 MHz		2000		pF
Output Capacitance	C_{oss}			180		
Reverse Transfer Capacitance	C_{rss}			60		
Total Gate Charge	Q_g	V_{DS} = 50 V, V_{GS} = 10 V, I_D = 12 A		31	47	nC
Gate-Source Charge	Q_{gs}			10		
Gate-Drain Charge	Q_{gd}			9		
Gate Resistance	R_g	f = 1 MHz		1.5		Ω
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 50 V, R_L = 5 Ω $I_D \cong$ 10 A, V_{GEN} = 10 V, R_g = 1 Ω		10	15	ns
Rise Time	t_r			10	15	
Turn-Off Delay Time	$t_{d(off)}$			15	25	
Fall Time	t_f			10	15	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	T_C = 25 °C			50	A
Pulse Diode Forward Current[a]	I_{SM}				40	
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		50	75	ns
Body Diode Reverse Recovery Charge	Q_{rr}			100	150	nC
Reverse Recovery Fall Time	t_a			38		ns
Reverse Recovery Rise Time	t_b			12		

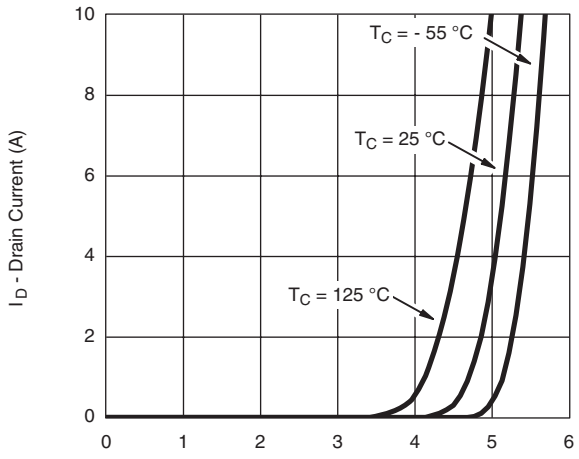
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

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.

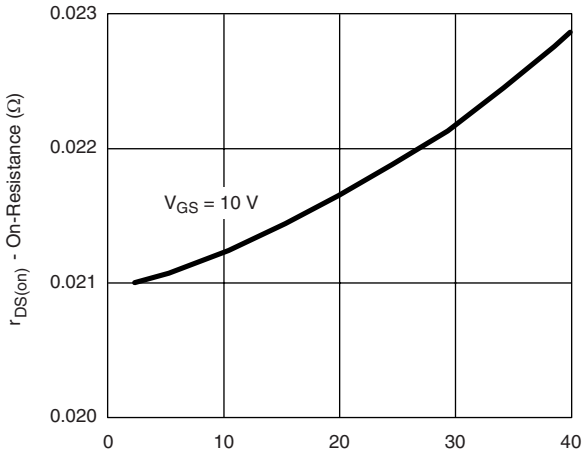
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



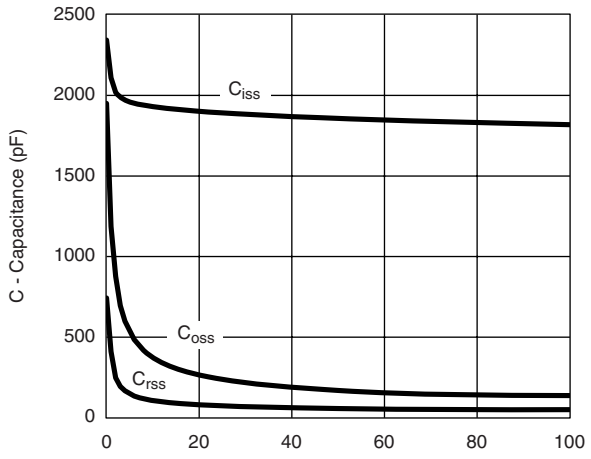
Output Characteristics



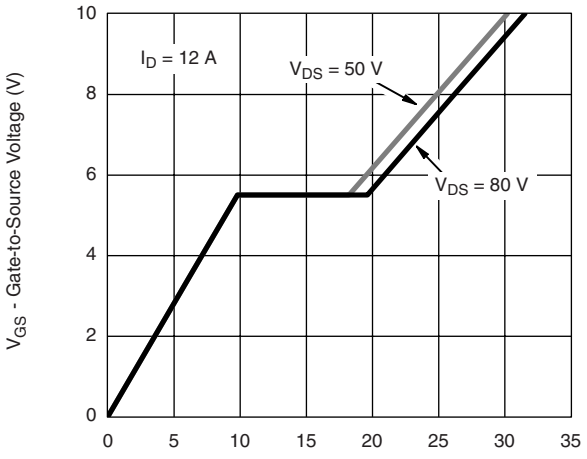
Transfer Characteristics



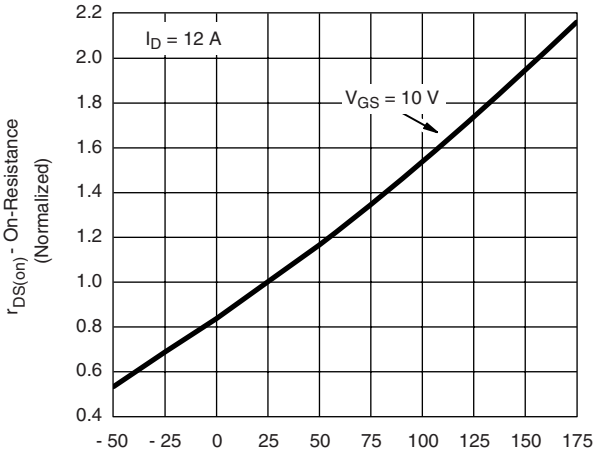
On-Resistance vs. Drain Current



Capacitance

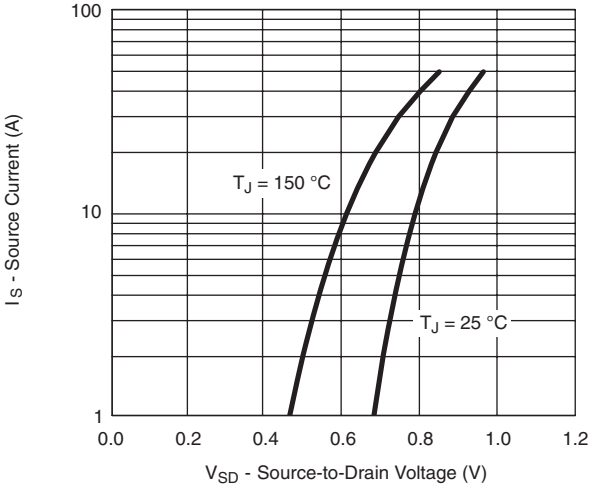


Gate Charge

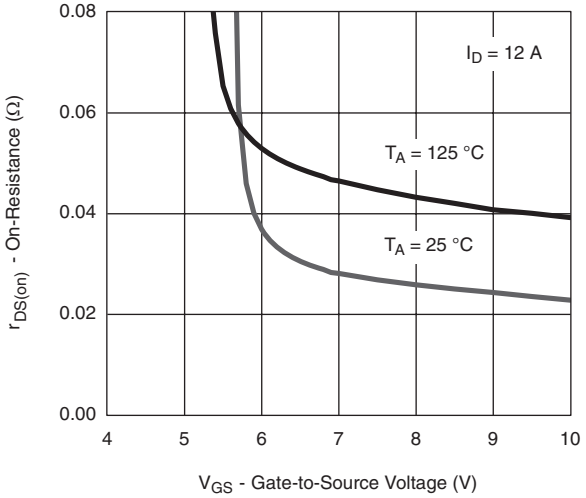


On-Resistance vs. Junction Temperature

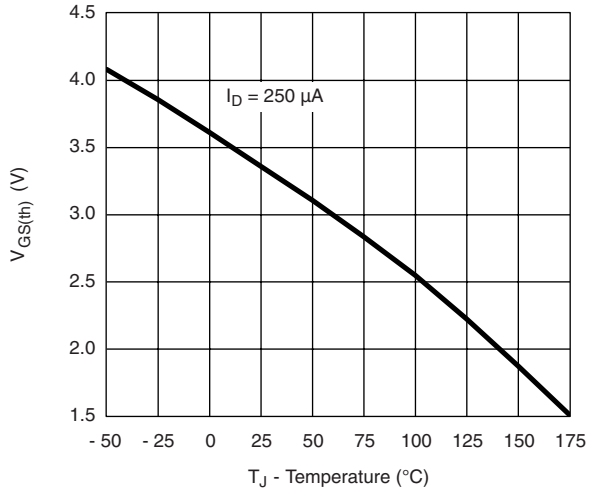
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



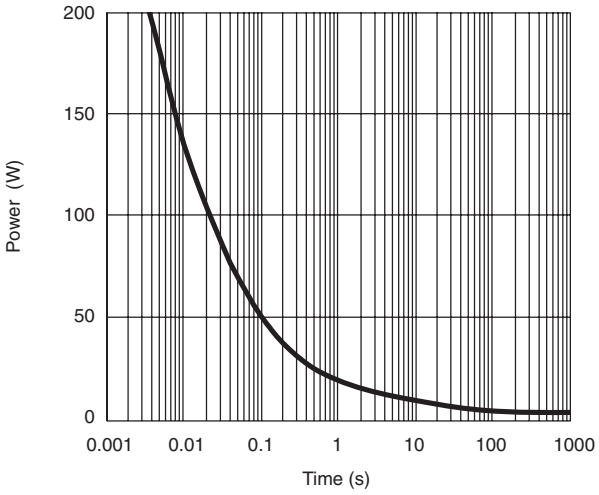
Source-Drain Diode Forward Voltage



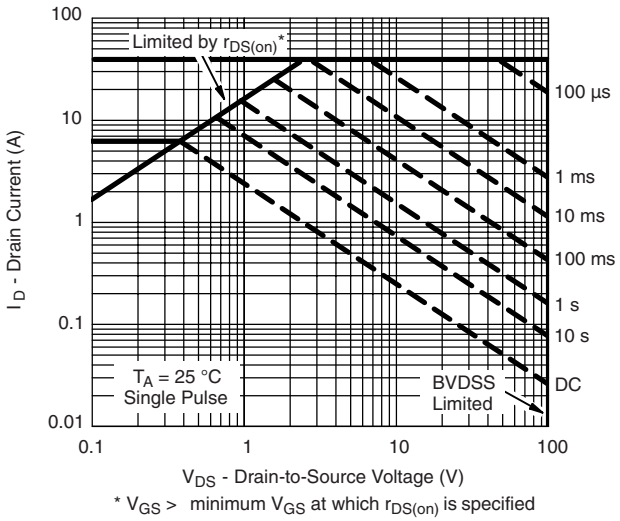
$r_{DS(on)}$ vs. V_{GS} vs. Temperature



Threshold Voltage



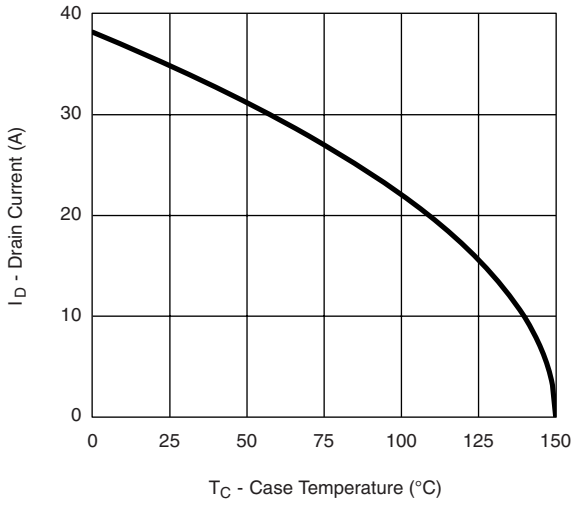
Single Pulse Power, Junction-to-Ambient



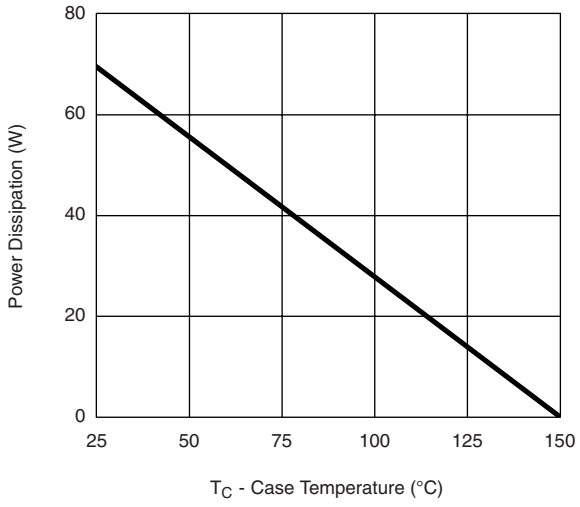
* V_{GS} > minimum V_{GS} at which $r_{DS(on)}$ is specified

Safe Operating Area

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



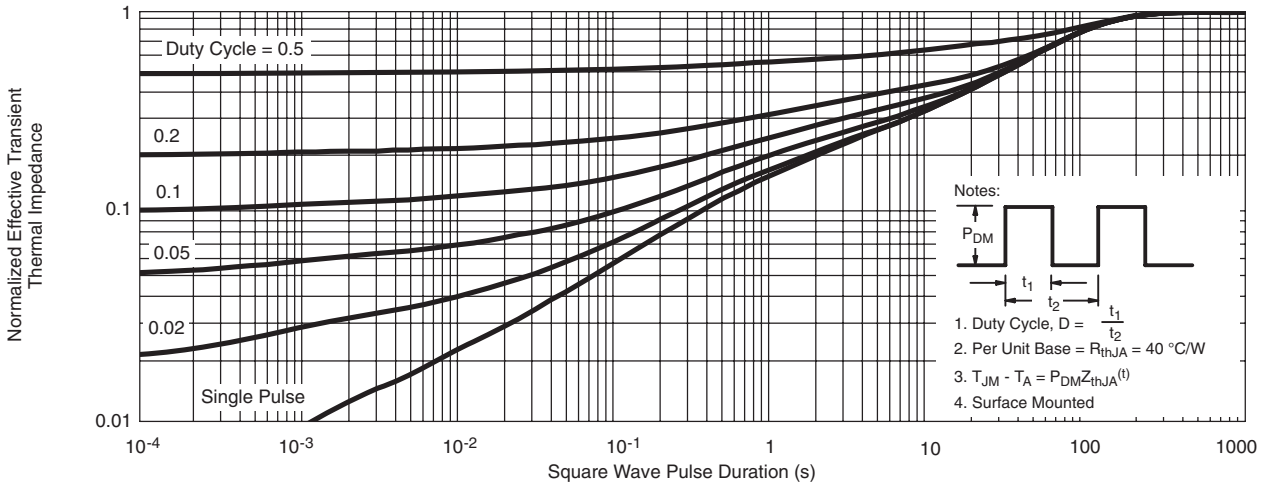
Current Derating*



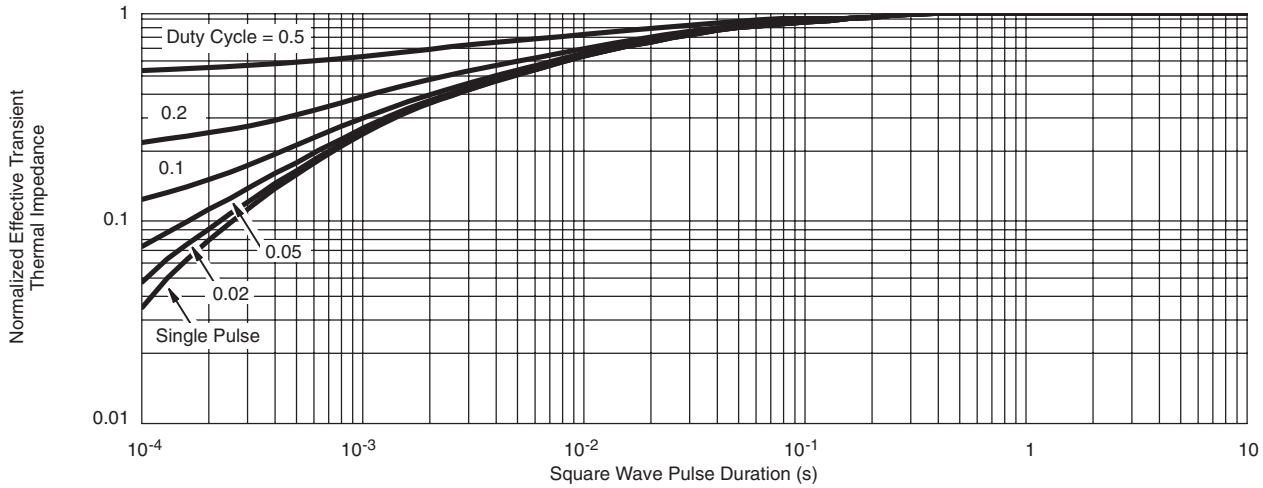
Power Derating

* The power dissipation P_D is based on $T_{J(max)}$ = 150 °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.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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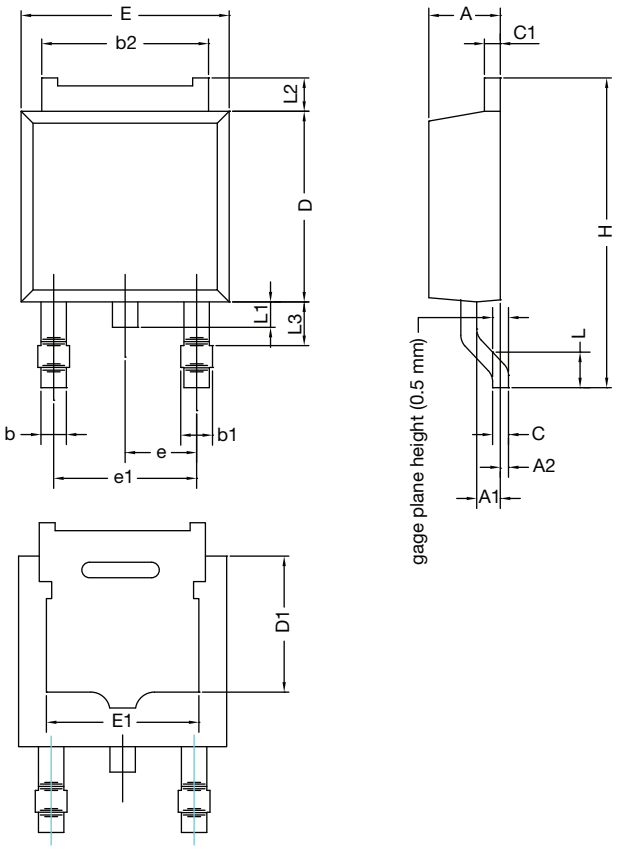
TO-252AA CASE OUTLINE

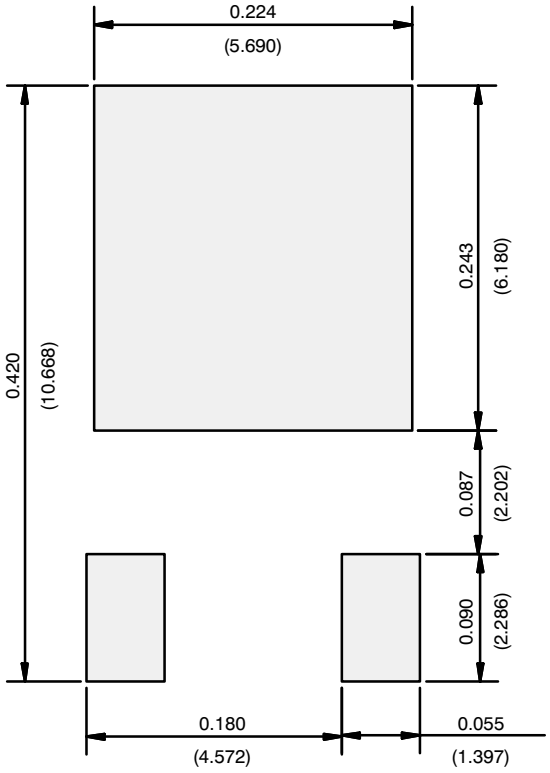


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.21	2.38	0.087	0.094
A1	0.89	1.14	0.035	0.045
A2	0.030	0.127	0.001	0.005
b	0.71	0.88	0.028	0.035
b1	0.76	1.14	0.030	0.045
b2	5.23	5.44	0.206	0.214
C	0.46	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.10	4.45	0.161	0.175
E	6.48	6.73	0.255	0.265
E1	4.49	5.50	0.177	0.217
e	2.28 BSC		0.090 BSC	
e1	4.57 BSC		0.180 BSC	
H	9.65	10.41	0.380	0.410
L	1.40	1.78	0.055	0.070
L1	0.64	1.02	0.025	0.040
L2	0.89	1.27	0.035	0.050
L3	1.15	1.52	0.040	0.060
ECN: T11-0110-Rev. L, 18-Apr-11 DWG: 5347				

Note

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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