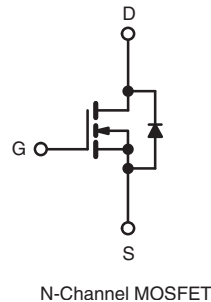
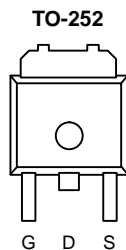


N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	100	
R _{DS(on)} (Ω)	V _{GS} = 10 V	0.20
Q _g (Max.) (nC)	16	
Q _{gs} (nC)	4.4	
Q _{gd} (nC)	7.7	
Configuration	Single	

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- Available in Tape and Reel
- Dynamic dV/dt Rating
- Repetitive Avalanche Rated
- 175 °C Operating Temperature
- Fast Switching
- Ease of Paralleling

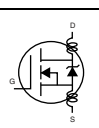



ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current	V _{GS} at 10 V	T _C = 25 °C	A
		T _C = 100 °C	
Pulsed Drain Current ^a	I _{DM}	37	W/°C
Linear Derating Factor		0.40	
Linear Derating Factor (PCB Mount)		0.025	
Single Pulse Avalanche Energy ^b	E _{AS}	200	mJ
Avalanche Currenta	I _{AR}	9.2	A
Repetitive Avalanche Energy ^a	E _{AR}	6.0	mJ
Maximum Power Dissipation	P _D	T _C = 25 °C	W
		T _A = 25 °C	
Peak Diode Recovery dV/dt ^c	dV/dt	5.5	V/ns
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to + 175	°C
Soldering Recommendations (Peak Temperature)	For 10 s	300 ^d	

Notes

- Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- V_{DD} = 25 V, starting T_J = 25 °C, L = 3.5 mH, R_g = 25 Ω, I_{AS} = 9.2 A (see fig. 12).
- I_{SD} ≤ 9.2 A, dI/dt ≤ 110 A/μs, V_{DD} ≤ V_{DS}, T_J ≤ 175 °C.

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient	R_{thJA}	-	62	°C/W
Maximum Junction-to-Ambient (PCB Mount) ^a	R_{thJA}	-	40	
Maximum Junction-to-Case (Drain)	R_{thJC}	-	2.5	

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}	$V_{GS} = 0, I_D = 250\ \mu\text{A}$		100	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to $25\text{ }^\circ\text{C}$, $I_D = 1\ \text{mA}$		-	0.13	-	V/°C
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$		1.5	-	3.0	V
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20\ \text{V}$		-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100\ \text{V}, V_{GS} = 0\ \text{V}$		-	-	25	μA
		$V_{DS} = 80\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 150\text{ }^\circ\text{C}$		-	-	250	
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10\ \text{V}$	$I_D = 5.5\ \text{A}^b$	-	0.20	-	Ω
Forward Transconductance	g_{fs}	$V_{DS} = 50\ \text{V}, I_D = 5.5\ \text{A}^b$		2.7	-	-	S
Dynamic							
Input Capacitance	C_{iss}	$V_{GS} = 0\ \text{V}, V_{DS} = 25\ \text{V}, f = 1.0\ \text{MHz}$, see fig. 5		-	360	-	pF
Output Capacitance	C_{oss}			-	150	-	
Reverse Transfer Capacitance	C_{rss}			-	34	-	
Total Gate Charge	Q_g	$V_{GS} = 10\ \text{V}$	$I_D = 9.2\ \text{A}, V_{DS} = 80\ \text{V}$, see fig. 6 and 13 ^b	-	-	16	nC
Gate-Source Charge	Q_{gs}			-	-	4.4	
Gate-Drain Charge	Q_{gd}			-	-	7.7	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\ \text{V}, I_D = 9.2\ \text{A}, R_g = 18\ \Omega, R_D = 5.2\ \Omega$, see fig. 10 ^b		-	8.8	-	ns
Rise Time	t_r			-	30	-	
Turn-Off Delay Time	$t_{d(off)}$			-	19	-	
Fall Time	t_f			-	20	-	
Internal Drain Inductance	L_D	Between lead, 6 mm (0.25") from package and center of die contact 		-	4.5	-	nH
Internal Source Inductance	L_S			-	7.5	-	
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p - n junction diode 		-	-	9.2	A
Pulsed Diode Forward Current ^a	I_{SM}			-	-	37	
Body Diode Voltage	V_{SD}	$T_J = 25\text{ }^\circ\text{C}, I_S = 9.2\ \text{A}, V_{GS} = 0\ \text{V}^b$		-	-	1.8	V
Body Diode Reverse Recovery Time	t_{rr}	$T_J = 25\text{ }^\circ\text{C}, I_F = 9.2\ \text{A}, dI/dt = 100\ \text{A}/\mu\text{s}^b$		-	110	260	ns
Body Diode Reverse Recovery Charge	Q_{rr}			-	0.53	1.3	μC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S and L_D)					

Notes

- a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- b. Pulse width $\leq 300\ \mu\text{s}$; duty cycle $\leq 2\ \%$.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

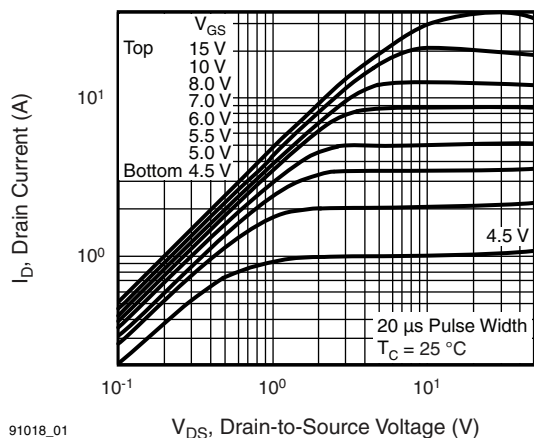


Fig. 1 - Typical Output Characteristics, $T_C = 25\text{ °C}$

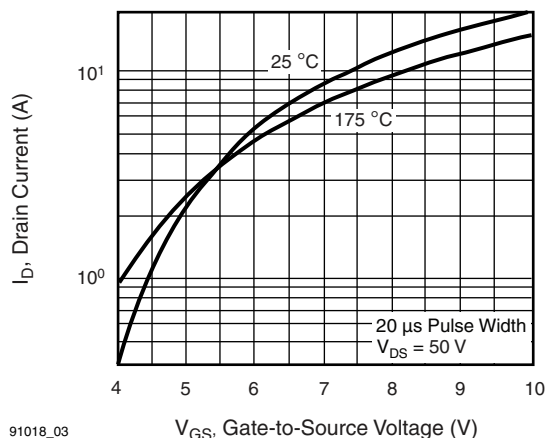


Fig. 3 - Typical Transfer Characteristics

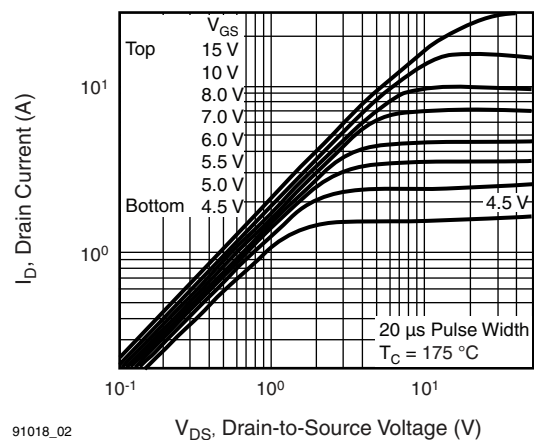


Fig. 2 - Typical Output Characteristics, $T_C = 175\text{ °C}$

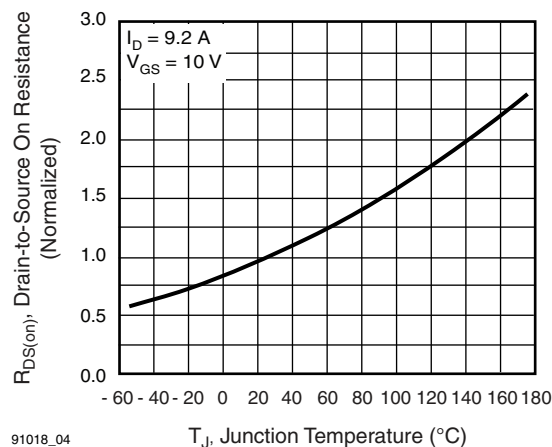
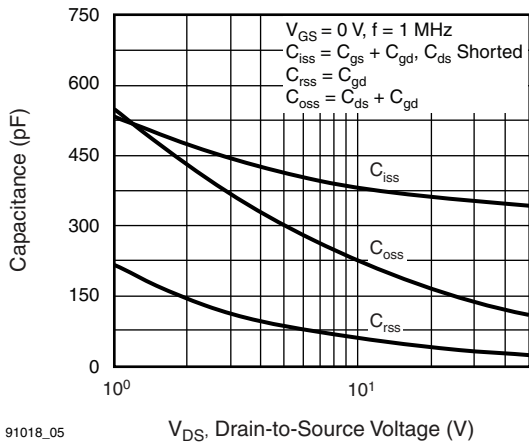
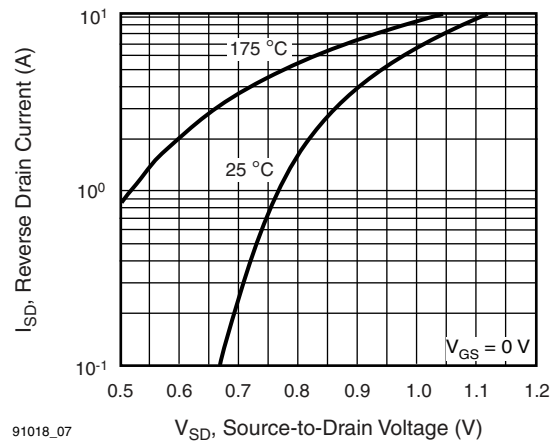


Fig. 4 - Normalized On-Resistance vs. Temperature



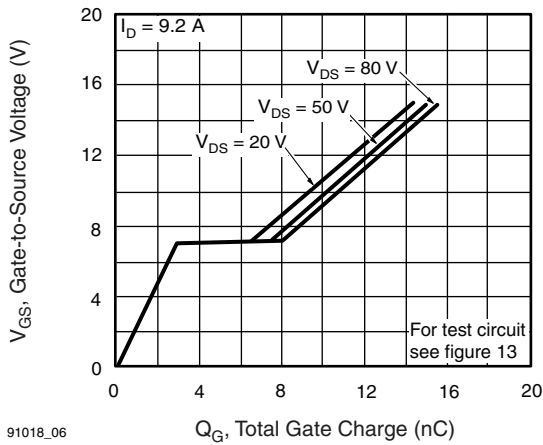
91018_05

Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage



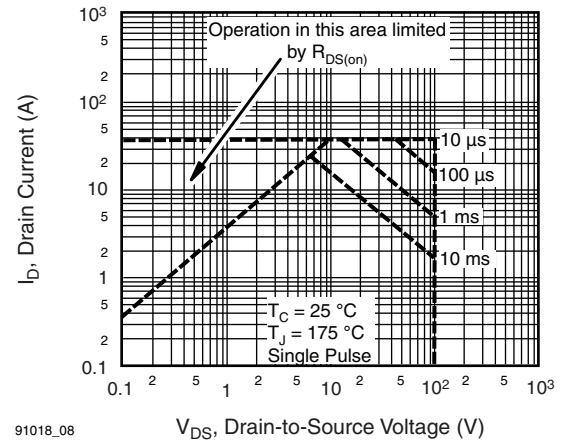
91018_07

Fig. 7 - Typical Source-Drain Diode Forward Voltage



91018_06

Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage



91018_08

Fig. 8 - Maximum Safe Operating Area

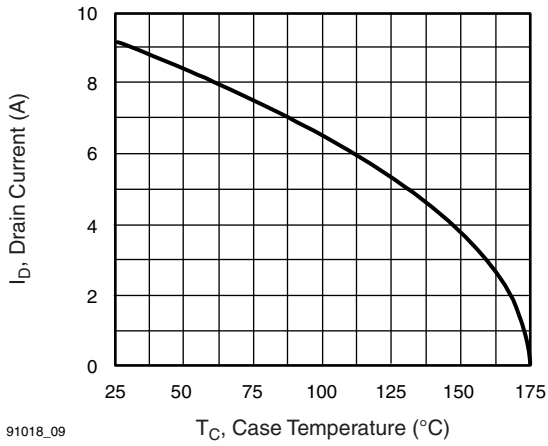


Fig. 9 - Maximum Drain Current vs. Case Temperature

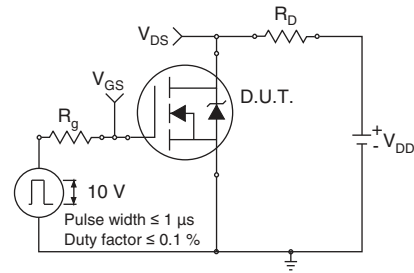


Fig. 10a - Switching Time Test Circuit

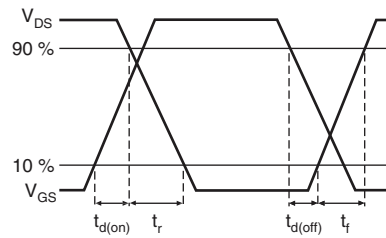


Fig. 10b - Switching Time Waveforms

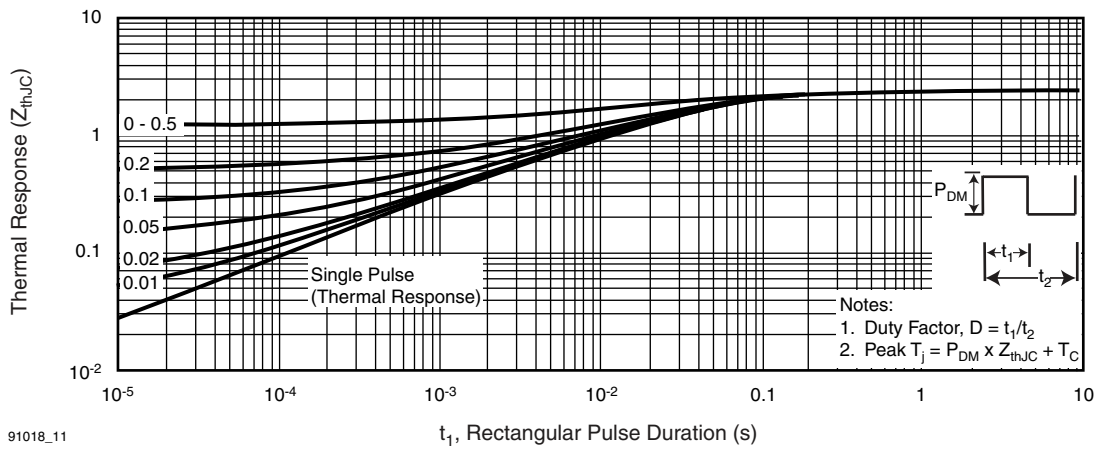


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

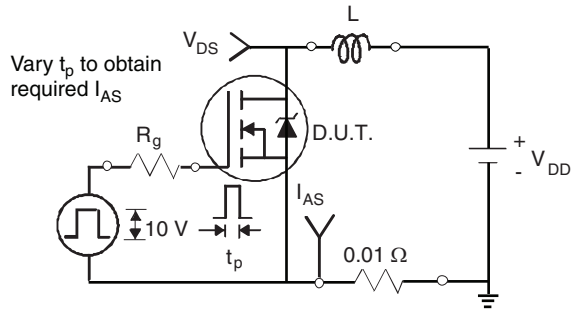


Fig. 12a - Unclamped Inductive Test Circuit

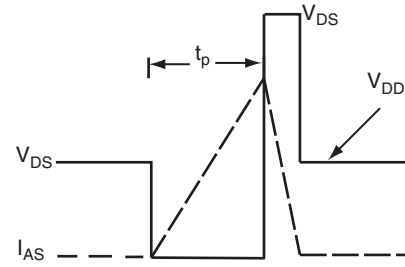


Fig. 12b - Unclamped Inductive Waveforms

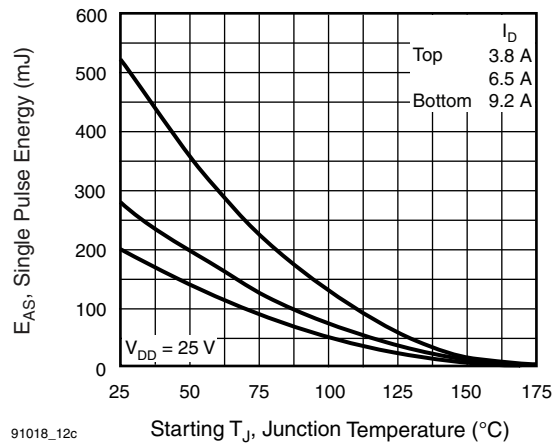


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

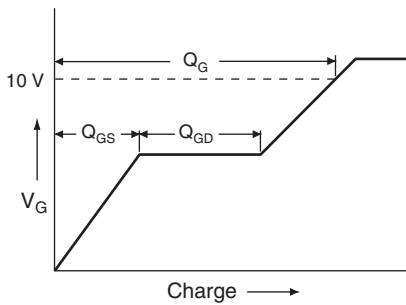


Fig. 13a - Basic Gate Charge Waveform

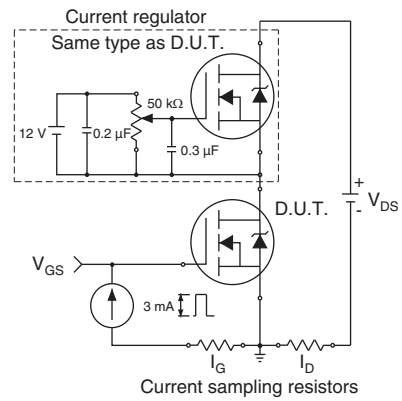
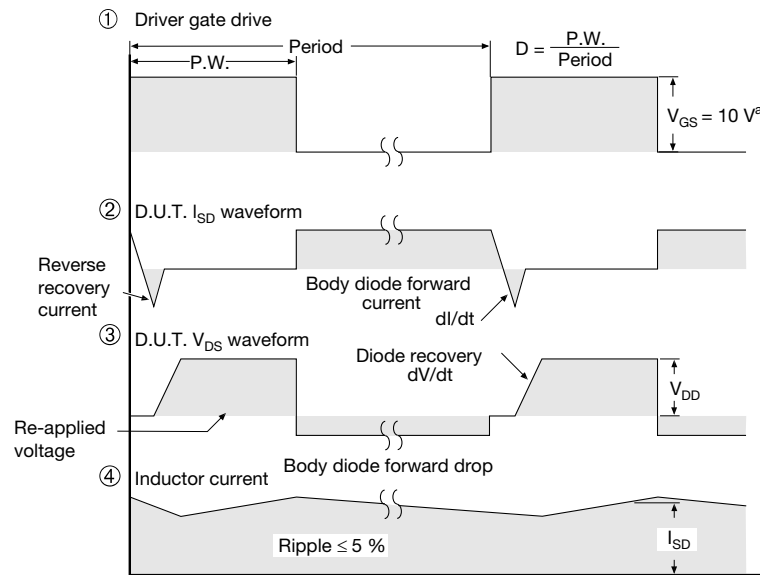
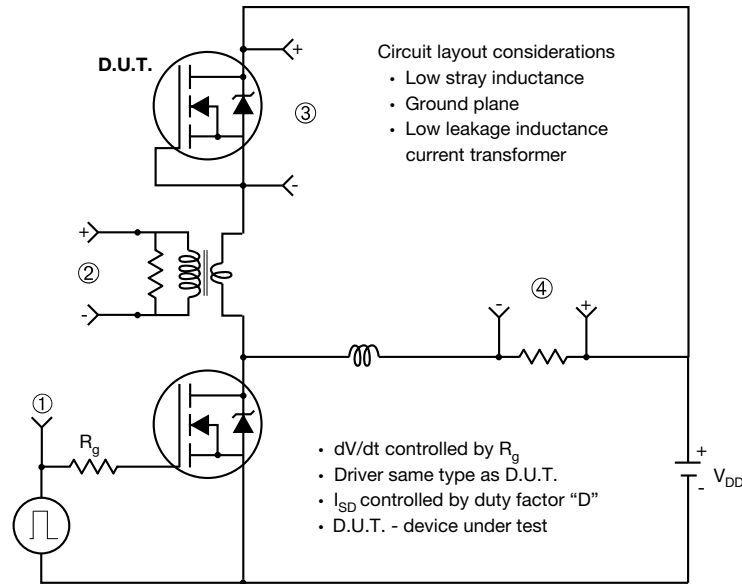


Fig. 13b - Gate Charge Test Circuit

Peak Diode Recovery dV/dt Test Circuit

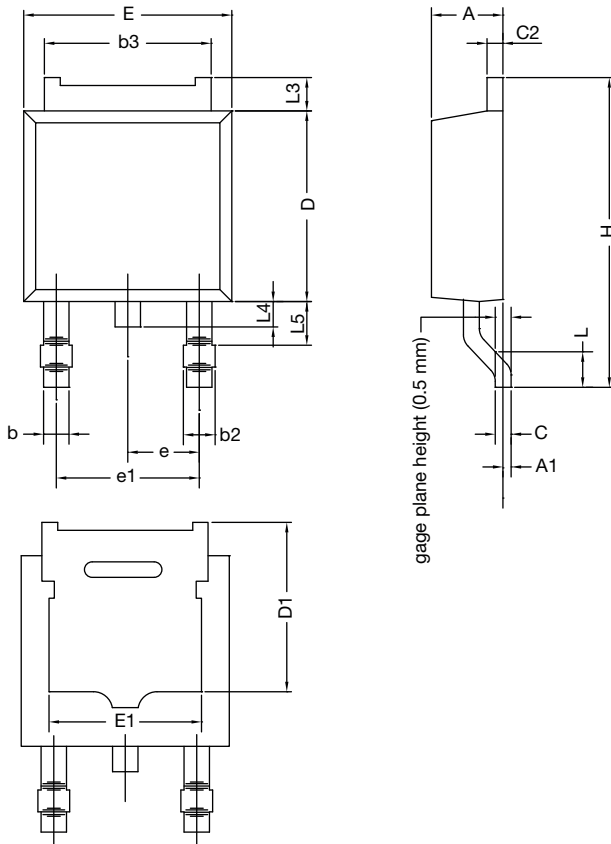


Note

a. $V_{GS} = 5 V$ for logic level devices

Fig. 14 - For N-Channel

TO-252AA CASE OUTLINE

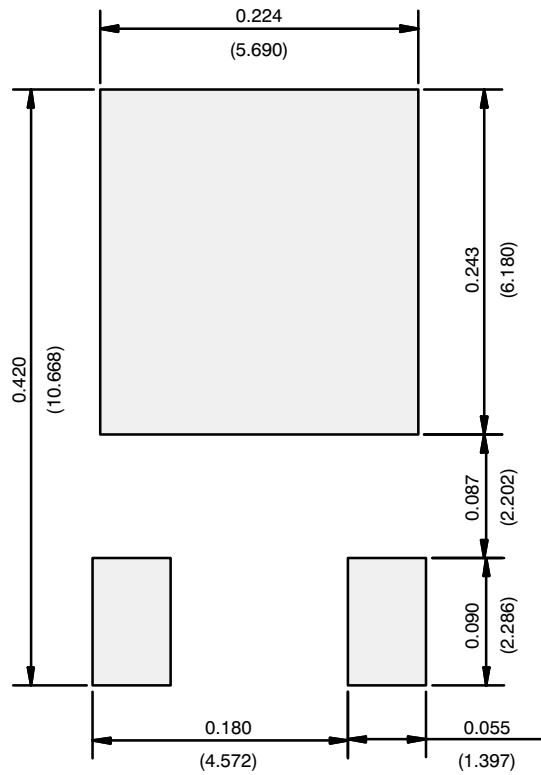


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.14	1.52	0.045	0.060
ECN: X12-0247-Rev. M, 24-Dec-12				
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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