

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic			Symbol	Value	Unit
Drain-Source Voltage			V _{DSS}	-40	V
Gate-Source Voltage			V _{GSS}	±20	V
Continuous Drain Current (Note 6) V _{GS} = -10V	Steady State	T _C = +25°C T _C = +100°C	I _D	-20 -12.7	A
Maximum Body Diode Continuous Current			I _S	-2.5	A
Pulsed Drain Current (10μs Pulse, Duty Cycle = 1%)			I _{DM}	-40	A
Avalanche Current (Note 7) L = 0.1mH			I _{AS}	-18	A
Avalanche Energy (Note 7) L = 0.1mH			E _{AS}	16	mJ

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic		Symbol	Value	Unit
Total Power Dissipation (Note 5)	T _A = +25°C	P _D	1.6	W
	T _A = +70°C		1.0	
Thermal Resistance, Junction to Ambient (Note 5)	Steady state	R _{θJA}	77	°C/W
	t < 10s		34	
Total Power Dissipation (Note 6)	T _A = +25°C	P _D	2.7	W
	T _A = +70°C		1.7	
Thermal Resistance, Junction to Ambient (Note 6)	Steady state	R _{θJA}	47	°C/W
	t < 10s		30	
Thermal Resistance, Junction to Case (Note 6)		R _{θJC}	4.8	
Operating and Storage Temperature Range		T _J , T _{STG}	-55 to +150	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS (Note 8)						
Drain-Source Breakdown Voltage	BV _{DSS}	-40	—	—	V	V _{GS} = 0V, I _D = -250μA
Zero Gate Voltage Drain Current T _J = +25°C	I _{DSS}	—	—	-1	μA	V _{DS} = -40V, V _{GS} = 0V
Gate-Source Leakage	I _{GSS}	—	—	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS (Note 8)						
Gate Threshold Voltage	V _{GS(TH)}	-1.0	—	-3.0	V	V _{DS} = V _{GS} , I _D = -250μA
Static Drain-Source On-Resistance	R _{DS(ON)}	—	33	45	mΩ	V _{GS} = -10V, I _D = -4.4A
			40	55		V _{GS} = -4.5V, I _D = -3.7A
Diode Forward Voltage	V _{SD}	—	-0.75	-1.2	V	V _{GS} = 0V, I _S = -3.9A
DYNAMIC CHARACTERISTICS (Note 9)						
Input Capacitance	C _{iss}	—	1328	—	pF	V _{DS} = -20V, V _{GS} = 0V, f = 1.0MHz
Output Capacitance	C _{oss}	—	103	—	pF	
Reverse Transfer Capacitance	C _{rss}	—	81	—	pF	
Gate Resistance	R _G	—	7.7	—	Ω	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz
Total Gate Charge (V _{GS} = -4.5V)	Q _g	—	11.2	—	nC	V _{DS} = -20V, I _D = -4.9A
Total Gate Charge (V _{GS} = -10V)	Q _g	—	23.2	—	nC	
Gate-Source Charge	Q _{gs}	—	3.3	—	nC	
Gate-Drain Charge	Q _{gd}	—	3.9	—	nC	
Turn-On Delay Time	t _{D(ON)}	—	18.5	—	ns	V _{DS} = -20V, I _D = -3.9A V _{GS} = -4.5V, R _G = 1Ω
Turn-On Rise Time	t _R	—	28.2	—	ns	
Turn-Off Delay Time	t _{D(OFF)}	—	38.8	—	ns	
Turn-Off Fall Time	t _F	—	28.6	—	ns	
Body Diode Reverse Recovery Time	t _{RR}	—	15.4	—	ns	I _F = -3.9A, di/dt = 100A/μs
Body Diode Reverse Recovery Charge	Q _{RR}	—	5.4	—	nC	

- Notes:
- Device mounted on FR-4 substrate PC board, 2oz copper, with minimum recommended pad layout.
 - Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.
 - I_{AS} and E_{AS} ratings are based on low frequency and duty cycles to keep T_J = +25°C.
 - Short duration pulse test used to minimize self-heating effect.
 - Guaranteed by design. Not subject to product testing.

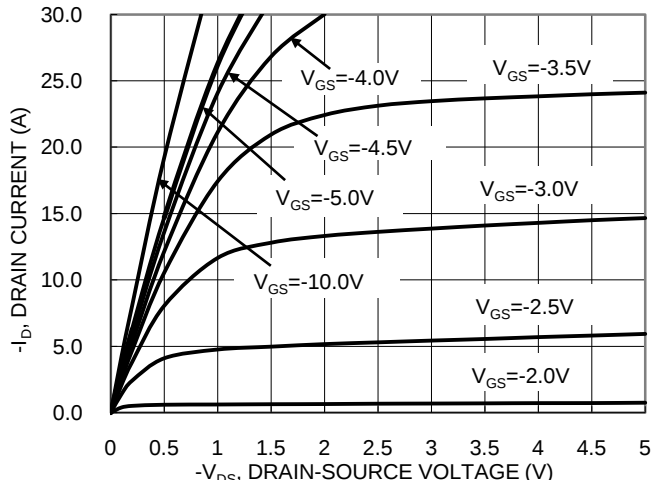


Figure 1. Typical Output Characteristic

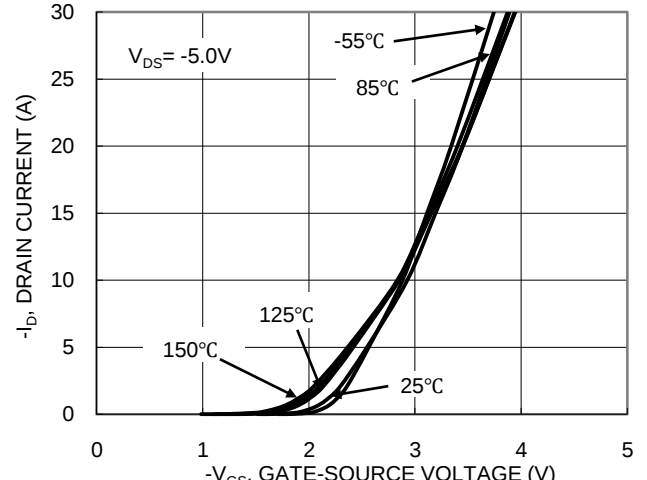


Figure 2. Typical Transfer Characteristic

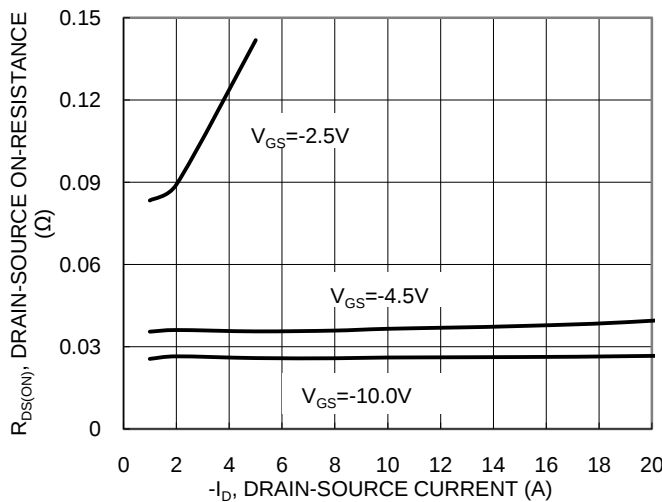


Figure 3. Typical On-Resistance vs. Drain Current and Gate Voltage

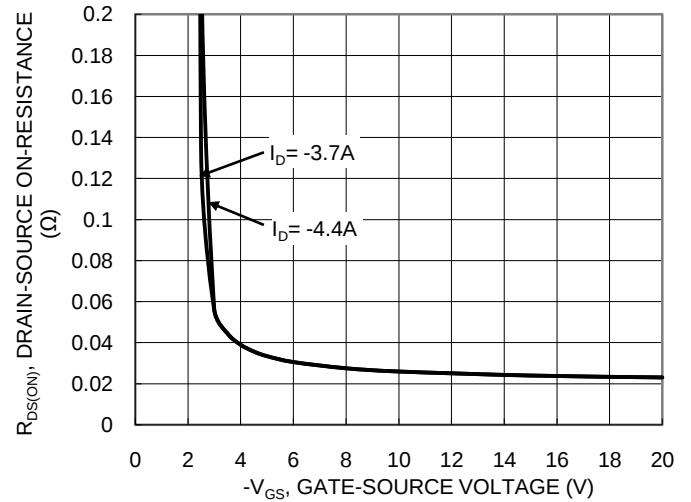


Figure 4. Typical On-Resistance vs. Gate Voltage

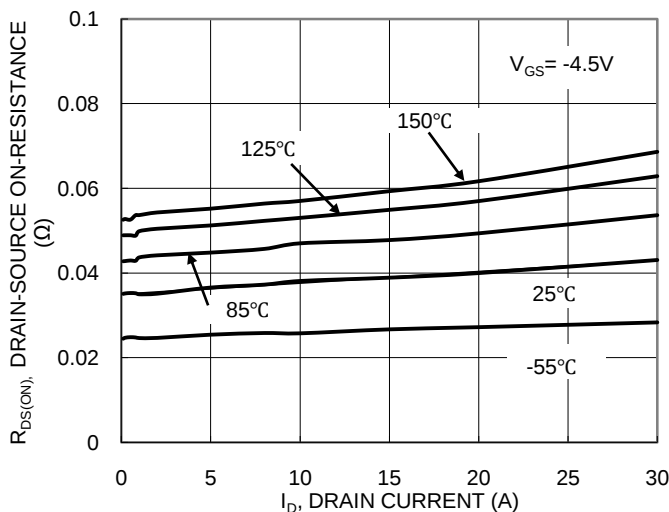


Figure 5. Typical On-Resistance vs. Drain Current and Temperature

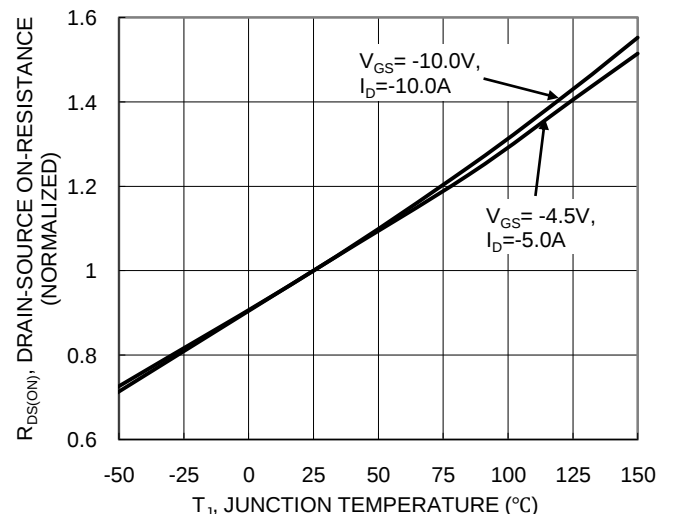


Figure 6. On-Resistance Variation with Temperature

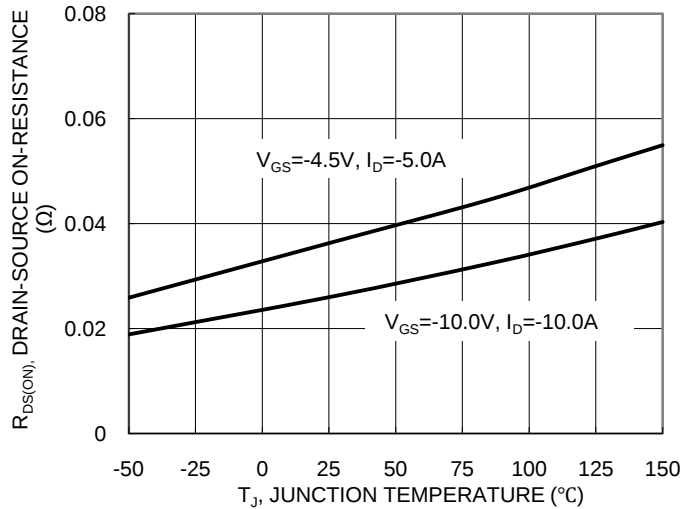


Figure 7. On-Resistance Variation with Temperature

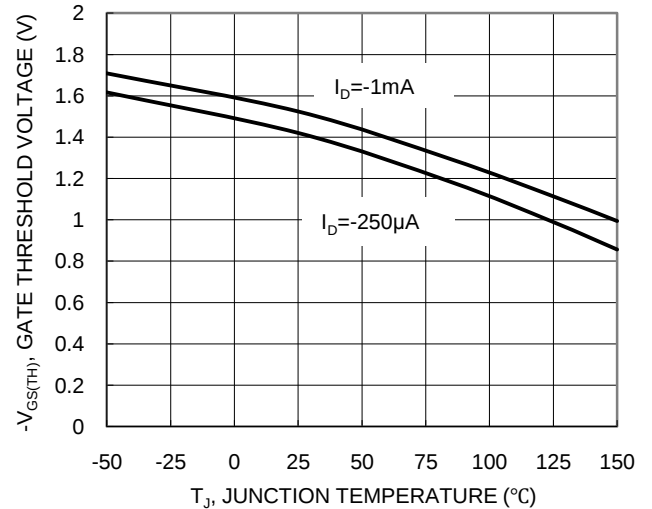


Figure 8. Gate Threshold Variation vs. Junction Temperature

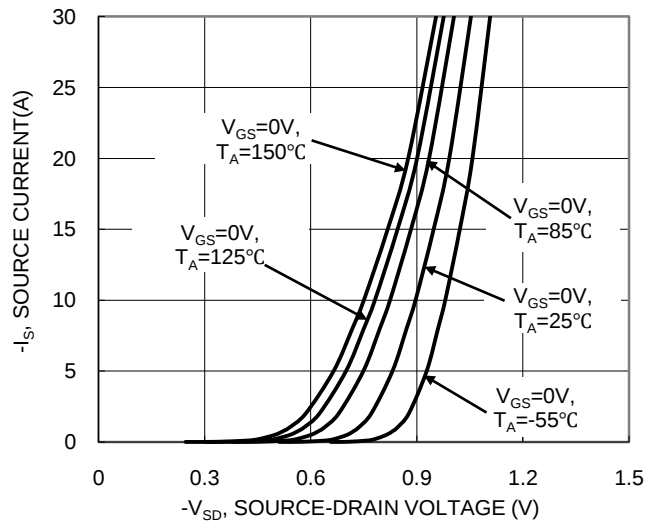


Figure 9. Diode Forward Voltage vs. Current

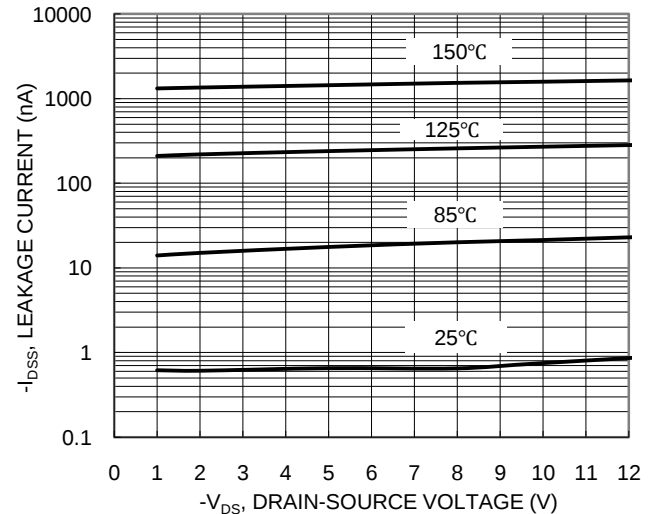


Figure 10. Typical Drain-Source Leakage Current vs. Voltage

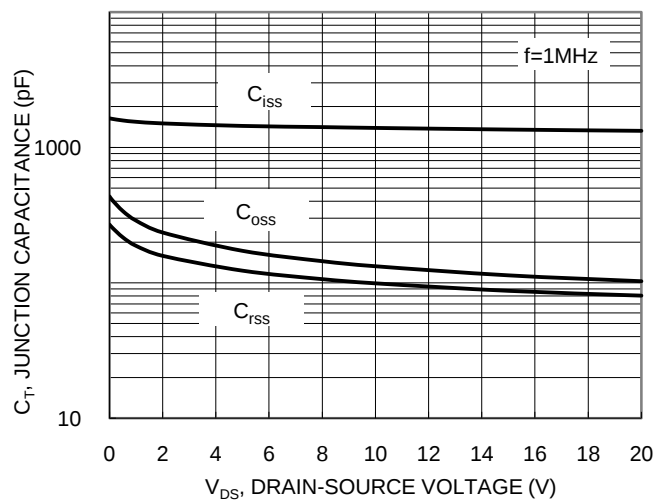


Figure 11. Typical Junction Capacitance

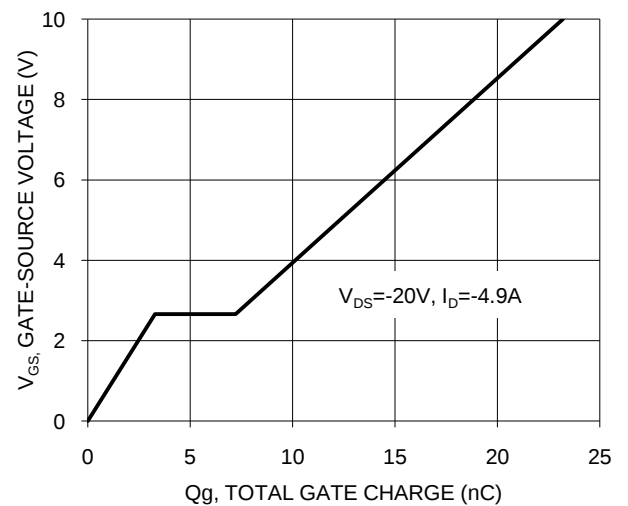
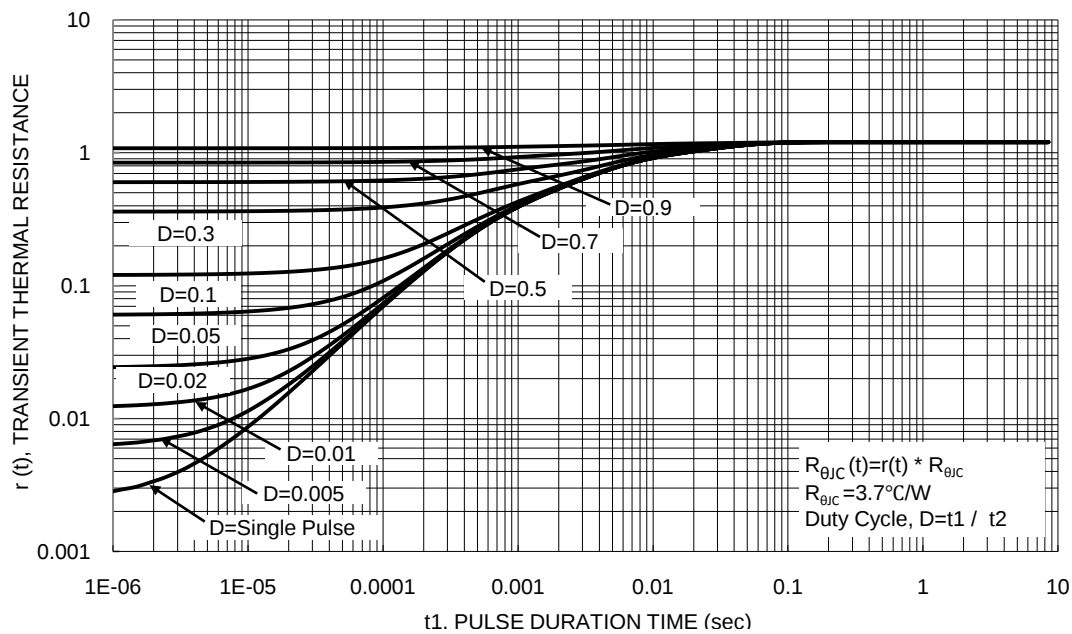
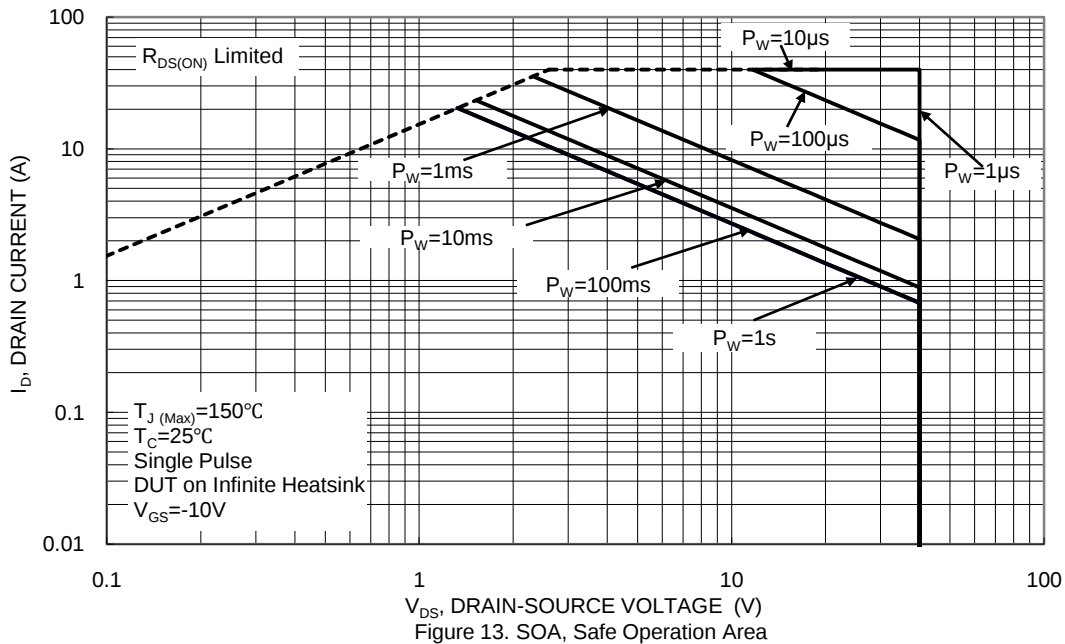


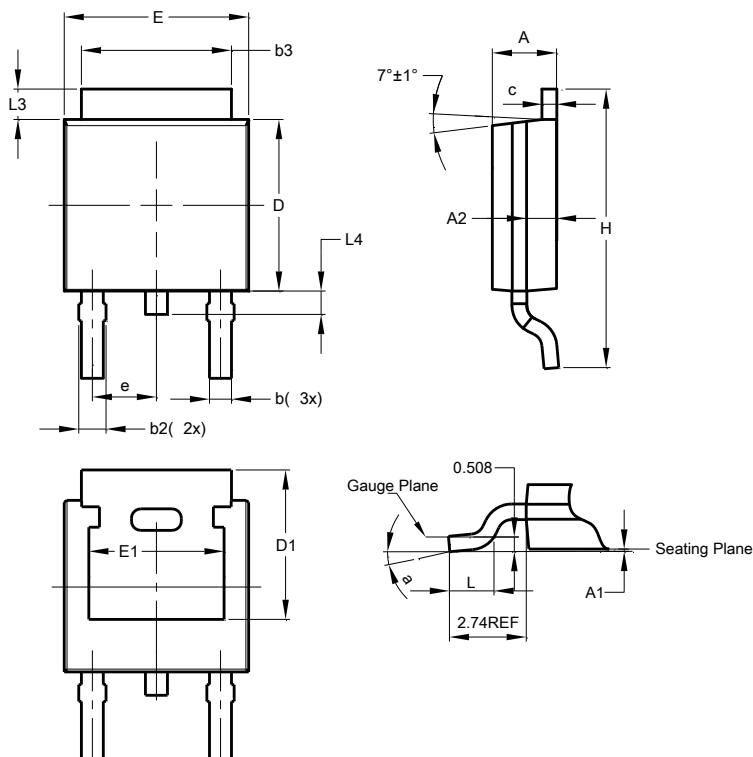
Figure 12. Gate Charge



Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO252 (DPAK)

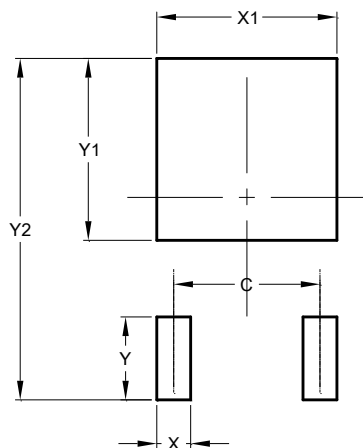


TO252 (DPAK)			
Dim	Min	Max	Typ
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	-	-
e	-	-	2.286
E	6.45	6.70	6.58
E1	4.32	-	-
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	-
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

TO252 (DPAK)



Dimensions	Value (in mm)
C	4.572
X	1.060
X1	5.632
Y	2.600
Y1	5.700
Y2	10.700

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