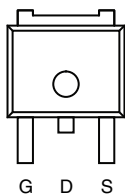


## PRODUCT SUMMARY

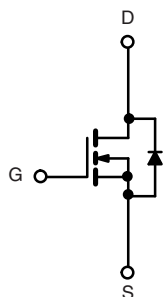
V <sub>DS</sub> (V)	150
R <sub>DS(on)</sub> (Ω) at V <sub>GS</sub> = 10 V	0.052
I <sub>D</sub> (A)	25
Configuration	Single

### TO-252



Top View

Drain Connected to Tab



N-Channel MOSFET

## FEATURES

- TrenchFET® Power MOSFET
- Package with Low Thermal Resistance
- 100 % R<sub>g</sub> and UIS Tested
- AEC-Q101 Qualified
- Material categorization:  
For definitions of compliance please see [www.freescale.net.cn](http://www.freescale.net.cn)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## ORDERING INFORMATION

Package	TO-252
Lead (Pb)-free and Halogen-free	SQD25N15-52-GE3

## ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> = 25 °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V <sub>DS</sub>	150	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current	I <sub>D</sub>	T <sub>C</sub> = 25 °C	25
		T <sub>C</sub> = 125 °C	16
Continuous Source Current (Diode Conduction) <sup>a</sup>	I <sub>S</sub>	50	A
Pulsed Drain Current <sup>b</sup>	I <sub>DM</sub>	63	
Single Pulse Avalanche Current	I <sub>AS</sub>	30	
Single Pulse Avalanche Energy	E <sub>AS</sub>	45	
Maximum Power Dissipation <sup>b</sup>	P <sub>D</sub>	T <sub>C</sub> = 25 °C	107
		T <sub>C</sub> = 125 °C	35
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to + 175	°C

## THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	R <sub>thJA</sub>	50	°C/W
Junction-to-Case (Drain)	R <sub>thJC</sub>	1.4	

### Notes

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

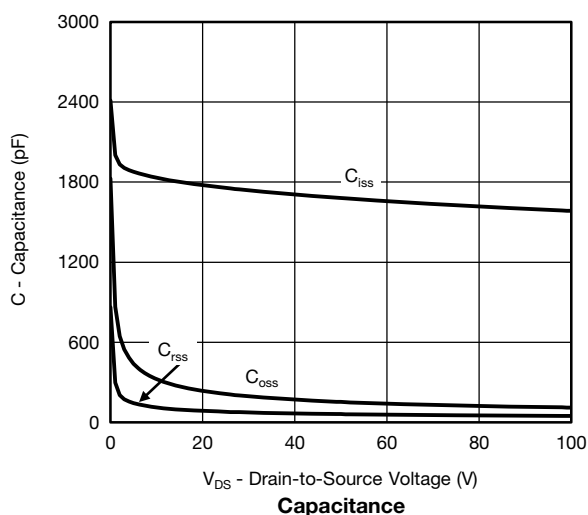
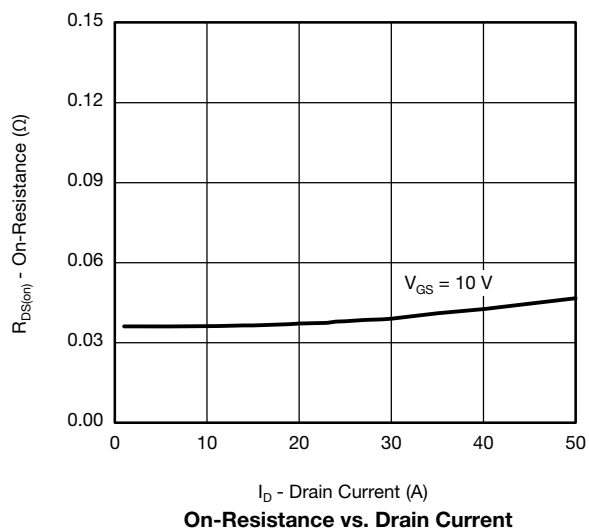
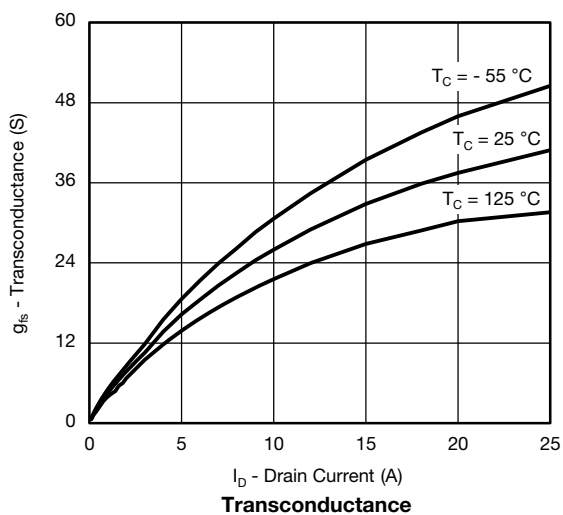
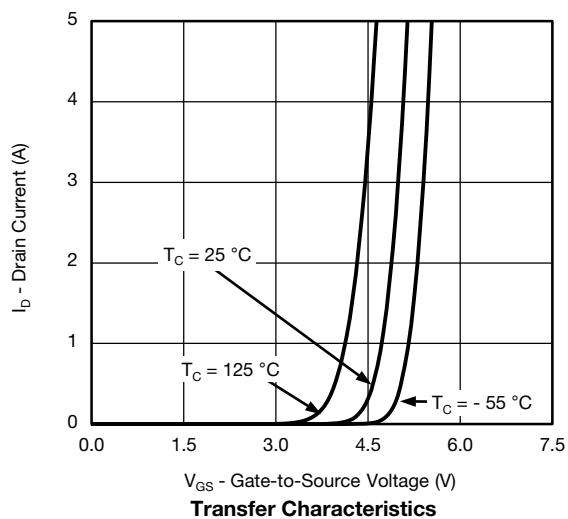
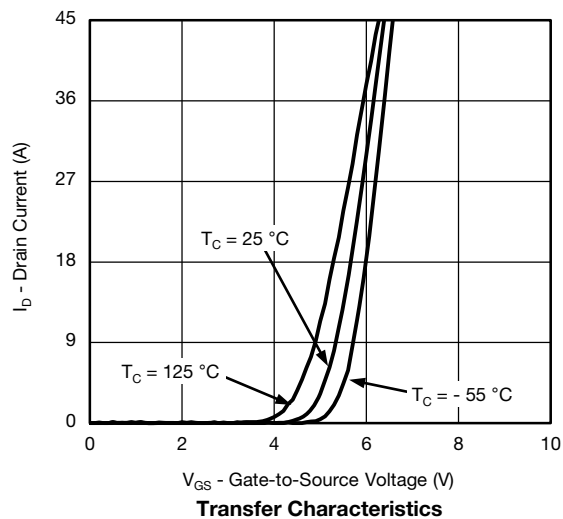
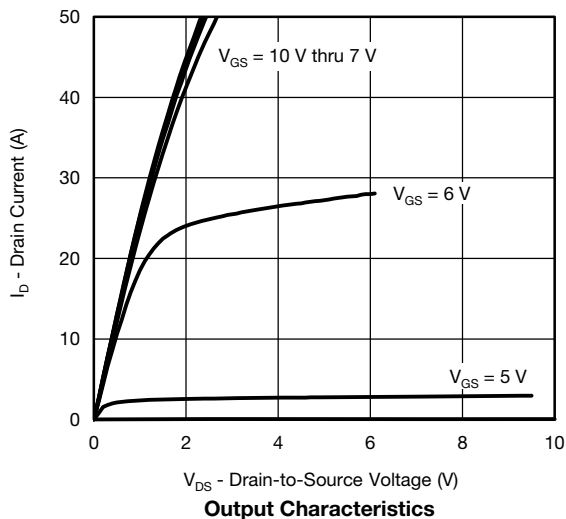
SPECIFICATIONS (T <sub>C</sub> = 25 °C, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA		150	-	-	V
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA		2.5	3	4	
Gate-Source Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 150 V	-	-	1	μA
		V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 150 V, T <sub>J</sub> = 125 °C	-	-	50	
		V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 150 V, T <sub>J</sub> = 175 °C	-	-	250	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>GS</sub> = 10 V	V <sub>DS</sub> ≥ 5 V	30	-	-	A
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V	I <sub>D</sub> = 15 A	-	0.038	0.052	Ω
		V <sub>GS</sub> = 10 V	I <sub>D</sub> = 15 A, T <sub>J</sub> = 125 °C	-	-	0.104	
		V <sub>GS</sub> = 10 V	I <sub>D</sub> = 15 A, T <sub>J</sub> = 175 °C	-	-	0.136	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 15 A		-	33	-	S
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V	V <sub>DS</sub> = 25 V, f = 1 MHz	-	1760	2200	pF
Output Capacitance	C <sub>oss</sub>			-	215	270	
Reverse Transfer Capacitance	C <sub>rss</sub>			-	80	100	
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>GS</sub> = 10 V	V <sub>DS</sub> = 75 V, I <sub>D</sub> = 25 A	-	34	51	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			-	14.5	-	
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			-	5.4	-	
Gate Resistance	R <sub>g</sub>	f = 1 MHz		1	1.8	2.6	Ω
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 75 V, R <sub>L</sub> = 3 Ω I <sub>D</sub> ≥ 25 A, V <sub>GEN</sub> = 10 V, R <sub>g</sub> = 1 Ω		-	11	17	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			-	11	17	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			-	20	30	
Fall Time <sup>c</sup>	t <sub>f</sub>			-	6	9	
Source-Drain Diode Ratings and Characteristics <sup>b</sup>							
Pulsed Current <sup>a</sup>	I <sub>SM</sub>			-	-	63	A
Forward Voltage	V <sub>SD</sub>	I <sub>F</sub> = 20 A, V <sub>GS</sub> = 0 V		-	0.87	1.5	V

**Notes**

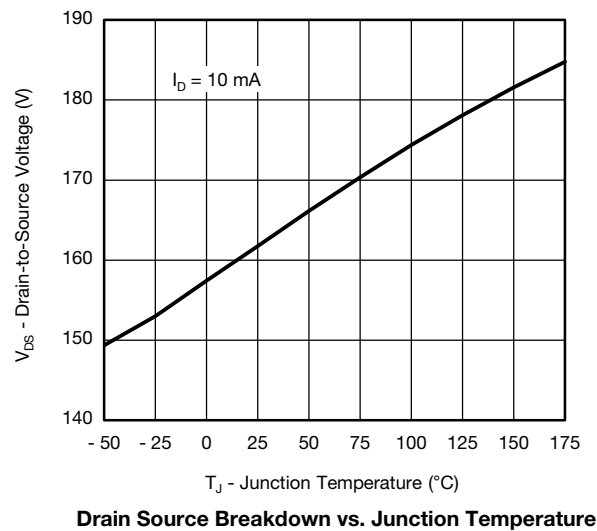
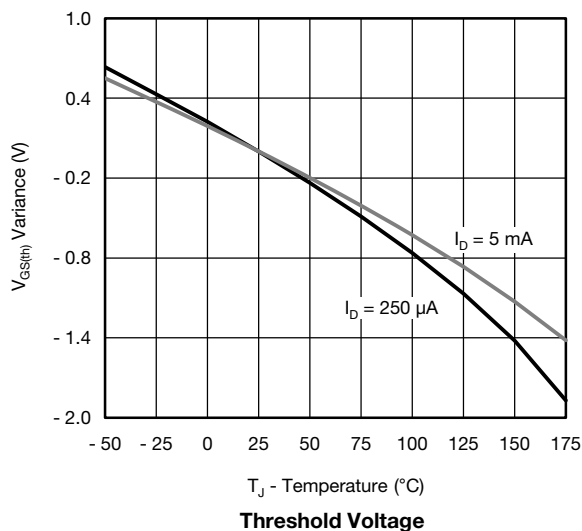
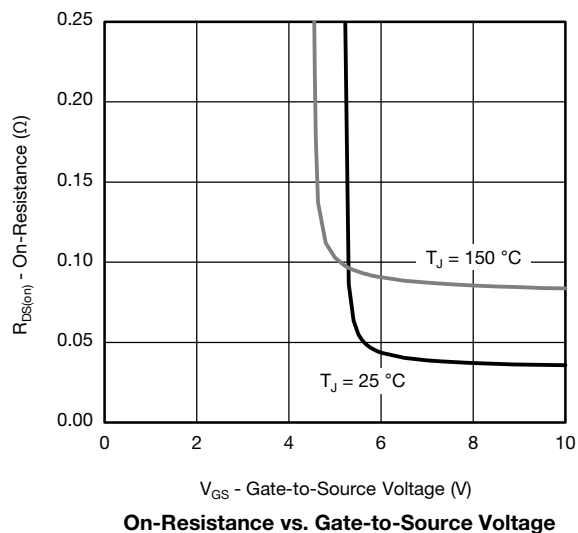
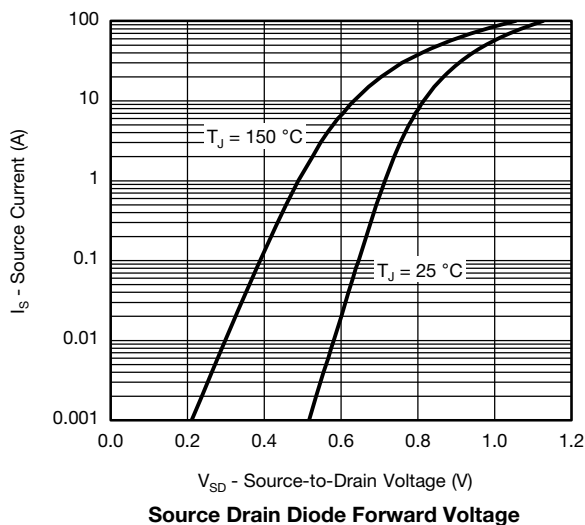
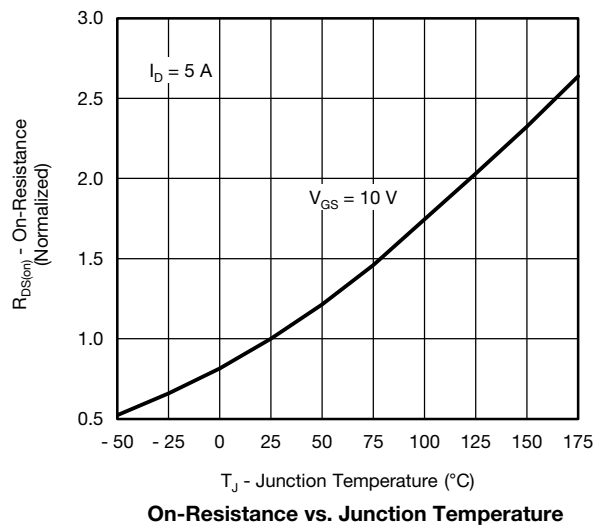
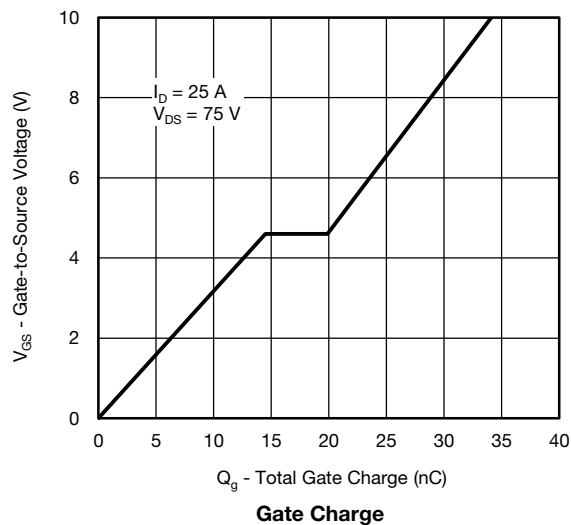
- Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

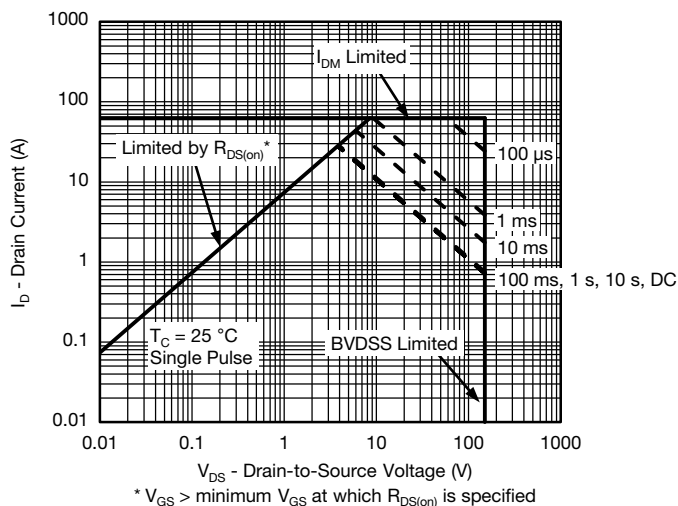
**TYPICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted)



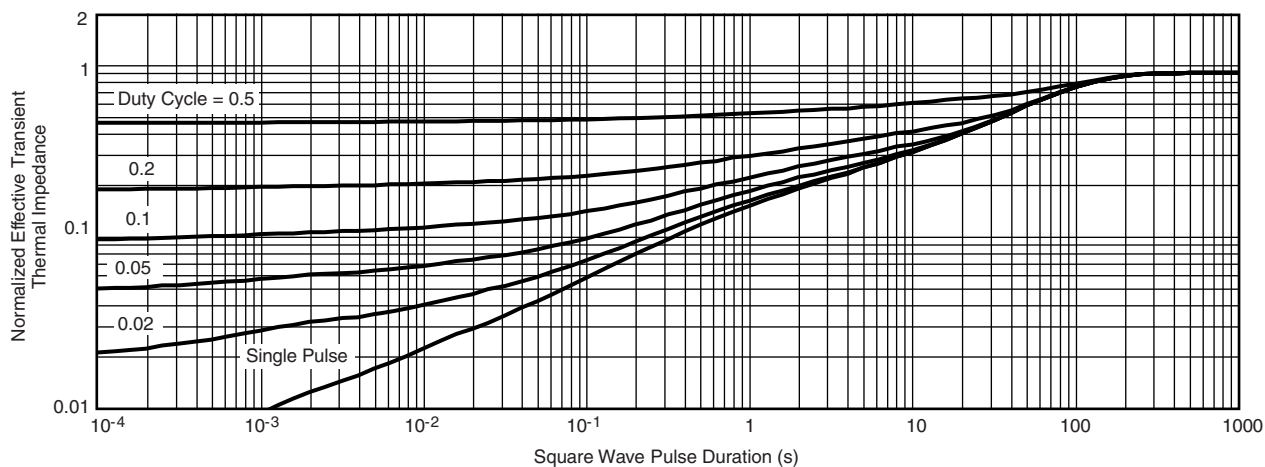
**TYPICAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$ , unless otherwise noted)



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

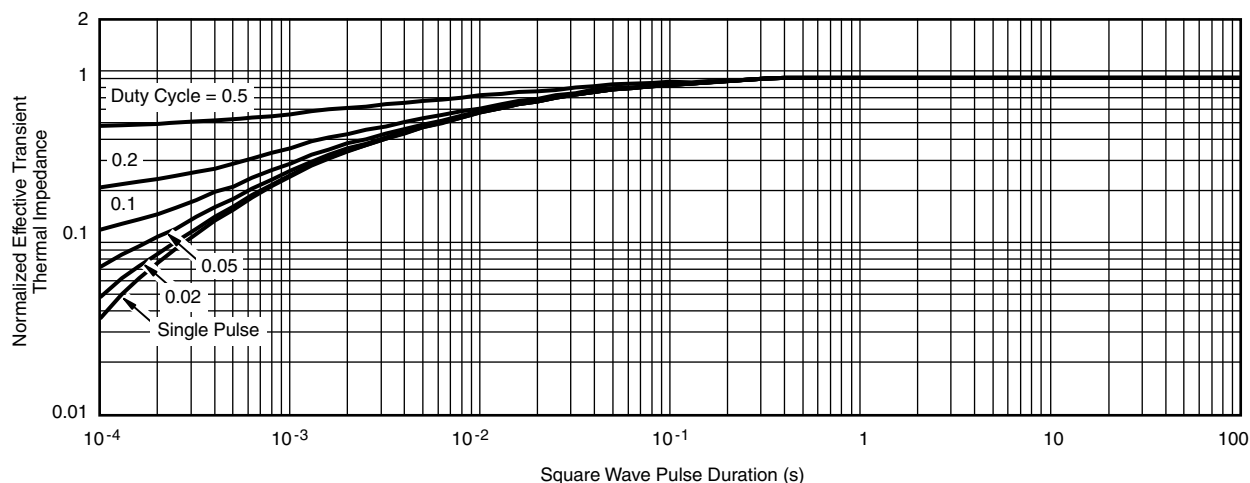


**Safe Operating Area**



**Normalized Thermal Transient Impedance, Junction-to-Ambient**

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

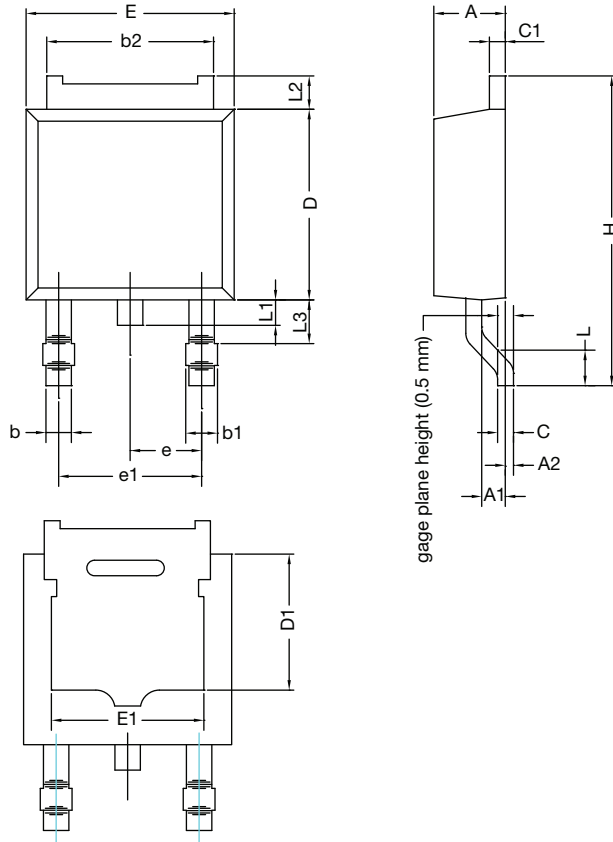


**Normalized Thermal Transient Impedance, Junction-to-Case**

**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-252AA CASE OUTLINE**

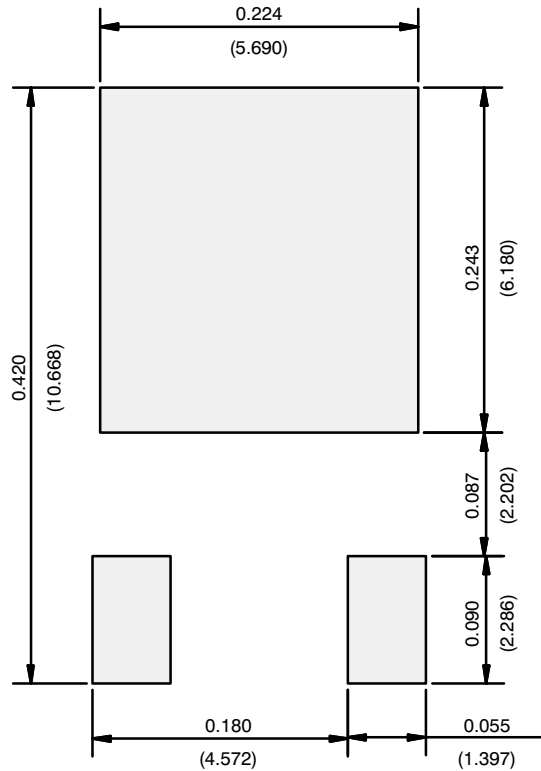


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.21	2.38	0.087	0.094
A1	0.89	1.14	0.035	0.045
A2	0.030	0.127	0.001	0.005
b	0.71	0.88	0.028	0.035
b1	0.76	1.14	0.030	0.045
b2	5.23	5.44	0.206	0.214
C	0.46	0.58	0.018	0.023
C1	0.46	0.58	0.018	0.023
D	5.97	6.22	0.235	0.245
D1	4.10	4.45	0.161	0.175
E	6.48	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)

[Return to Index](#)



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