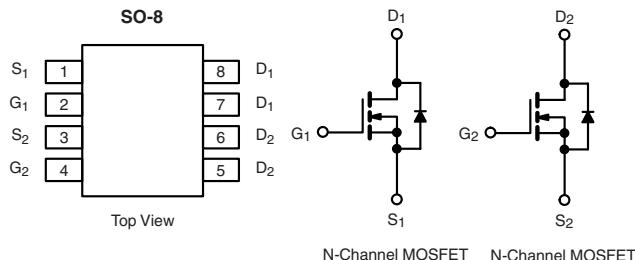


## Automotive Dual N-Channel 40 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY	
$V_{DS}$ (V)	40
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = 10$ V	0.020
$R_{DS(on)}$ ( $\Omega$ ) at $V_{GS} = 4.5$ V	0.026
$I_D$ (A)	8
Configuration	Dual

### FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- 100 %  $R_g$  and UIS Tested
- AEC-Q101 Qualified<sup>d</sup>
- Compliant to RoHS Directive 2002/95/EC



### ORDERING INFORMATION

Package	SO-8
Lead (Pb)-free and Halogen-free	SQ4942EY-T1-GE3

### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	$V_{DS}$	40	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current	$I_D$	8	A
		6.3	
Continuous Source Current (Diode Conduction)	$I_S$	4	
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	30	
Single Pulse Avalanche Energy	$I_{AS}$	28	mJ
Single Pulse Avalanche Current	$E_{AS}$	39	
Maximum Power Dissipation <sup>b</sup>	$P_D$	4.4	W
		1.4	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to + 175	°C

### THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	$R_{thJA}$	110	°C/W
Junction-to-Foot (Drain)	$R_{thJF}$	34	

#### Notes

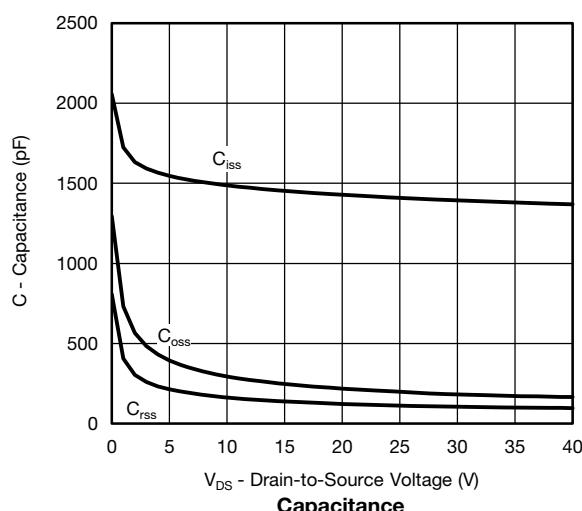
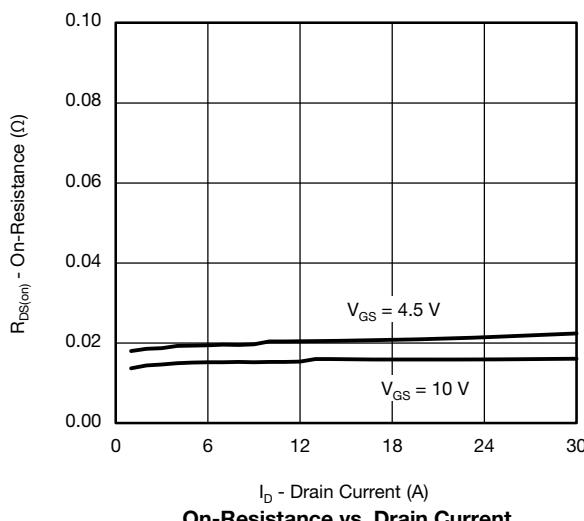
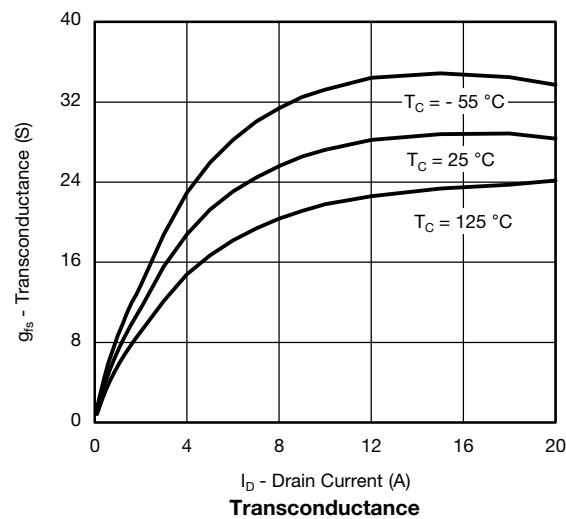
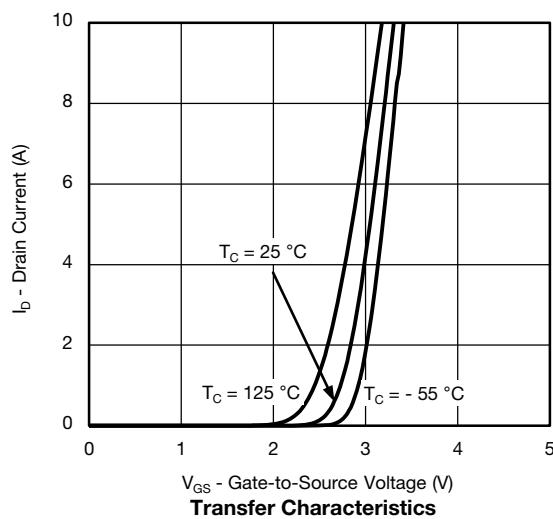
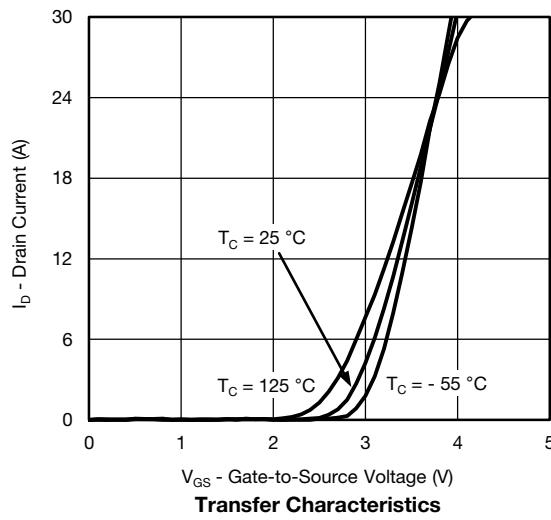
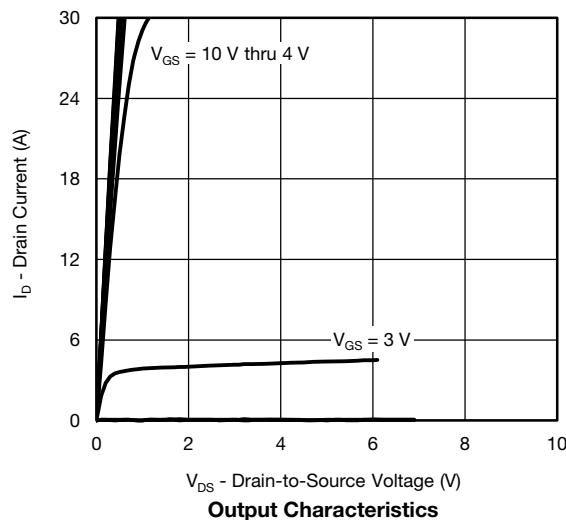
- Package limited.
- Pulse test; pulse width  $\leq 300$   $\mu$ s, duty cycle  $\leq 2$  %.
- When mounted on 1" square PCB (FR-4 material).
- Parametric verification ongoing.

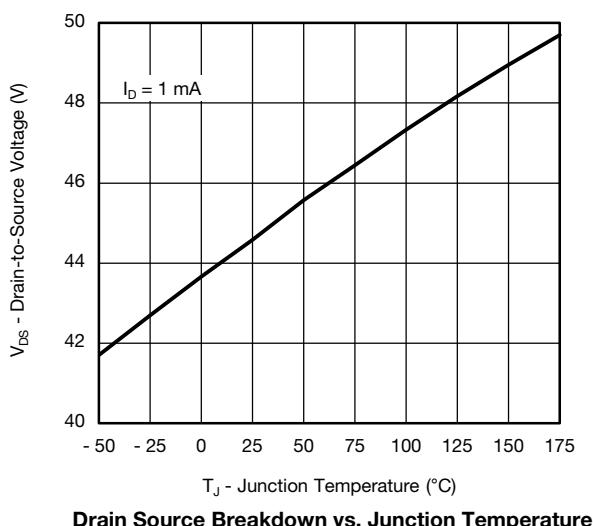
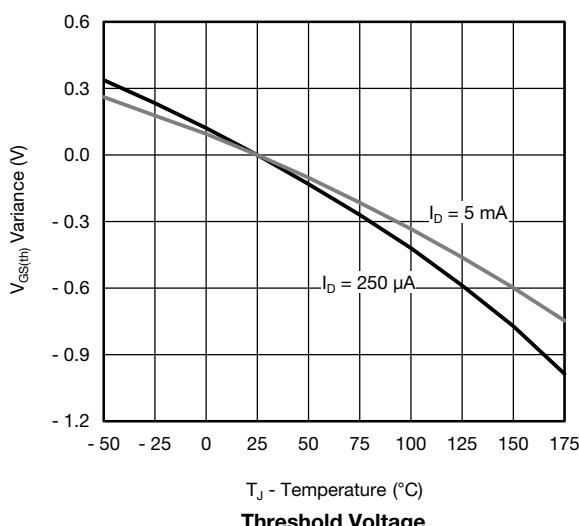
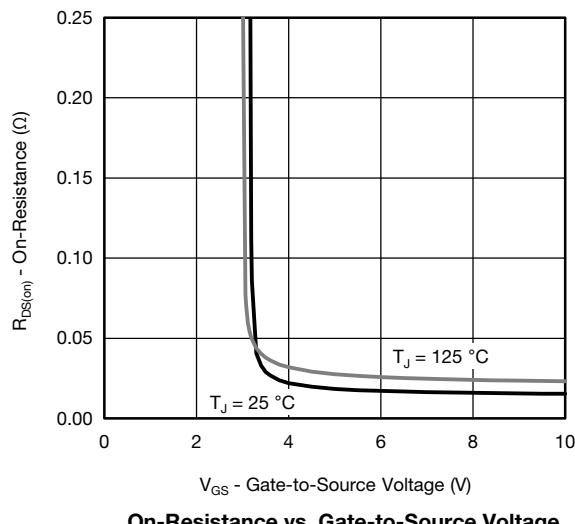
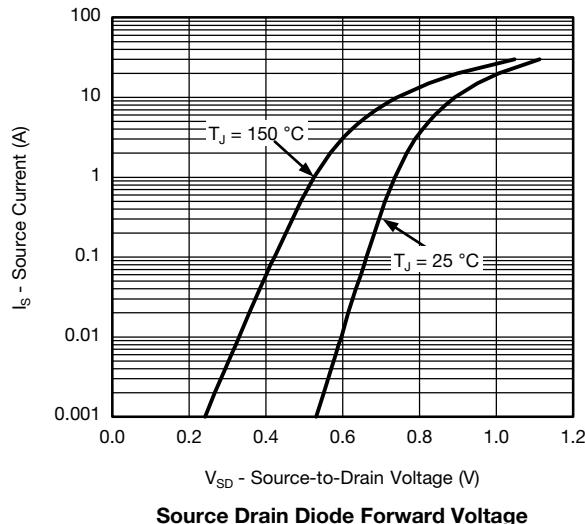
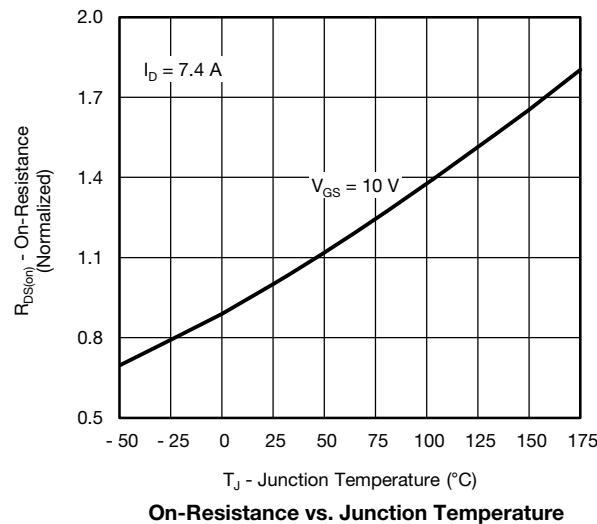
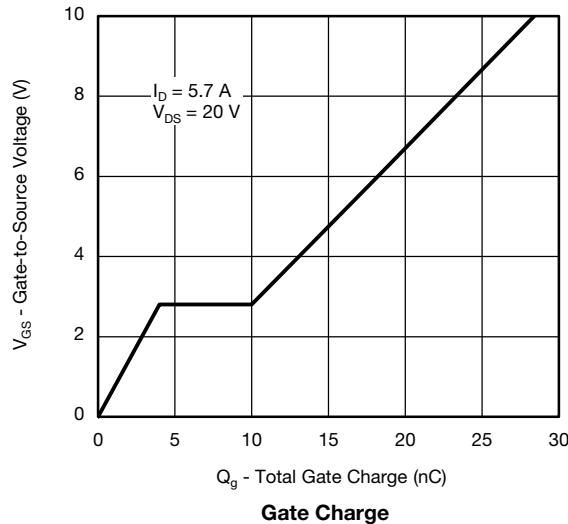
<b>SPECIFICATIONS</b> ( $T_C = 25^\circ\text{C}$ , unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
<b>Static</b>								
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}$ , $I_D = 250\text{ }\mu\text{A}$		40	-	-	V	
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$ , $I_D = 250\text{ }\mu\text{A}$		1.5	2	2.5		
Gate-Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}$ , $V_{GS} = \pm 20\text{ V}$		-	-	$\pm 100$	nA	
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 40\text{ V}$	-	-	1.0	$\mu\text{A}$	
		$V_{GS} = 0\text{ V}$	$V_{DS} = 40\text{ V}$ , $T_J = 55^\circ\text{C}$	-	-	50		
		$V_{GS} = 0\text{ V}$	$V_{DS} = 40\text{ V}$ , $T_J = 175^\circ\text{C}$	-	-	150		
On-State Drain Current <sup>a</sup>	$I_{D(\text{on})}$	$V_{GS} = 10\text{ V}$	$V_{DS} \geq 5\text{ V}$	20	-	-	A	
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(\text{on})}$	$V_{GS} = 10\text{ V}$	$I_D = 6\text{ A}$	-	0.016	0.020	$\Omega$	
		$V_{GS} = 10\text{ V}$	$I_D = 6\text{ A}$ , $T_J = 125^\circ\text{C}$	-	-	0.031		
		$V_{GS} = 10\text{ V}$	$I_D = 6\text{ A}$ , $T_J = 175^\circ\text{C}$	-	-	0.036		
		$V_{GS} = 4.5\text{ V}$	$I_D = 5\text{ A}$	-	0.020	0.026		
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}$ , $I_D = 6\text{ A}$		-	23	-	S	
<b>Dynamic<sup>b</sup></b>								
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}$	$V_{DS} = 25\text{ V}$ , $f = 1\text{ MHz}$	-	1409	1760	pF	
Output Capacitance	$C_{oss}$			-	199	250		
Reverse Transfer Capacitance	$C_{rss}$			-	112	140		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{GS} = 10\text{ V}$	$V_{DS} = 20\text{ V}$ , $I_D = 5.7\text{ A}$	-	28.4	43	nC	
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			-	4	-		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			-	6	-		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		0.5	-	2	$\Omega$	
Turn-On Delay Time <sup>c</sup>	$t_{d(\text{on})}$	$V_{DD} = 20\text{ V}$ , $R_L = 3.5\text{ }\Omega$ $I_D \approx 5.7\text{ A}$ , $V_{GEN} = 10\text{ V}$ , $R_g = 1\text{ }\Omega$		-	8	12	ns	
Rise Time <sup>c</sup>	$t_r$			-	13	20		
Turn-Off Delay Time <sup>c</sup>	$t_{d(\text{off})}$			-	20	30		
Fall Time <sup>c</sup>	$t_f$			-	9	14		
<b>Source-Drain Diode Ratings and Characteristics<sup>b</sup></b>								
Pulsed Current <sup>a</sup>	$I_{SM}$			-	-	30	A	
Forward Voltage	$V_{SD}$	$I_F = 1.8\text{ A}$ , $V_{GS} = 0\text{ V}$		-	0.75	1.1	V	

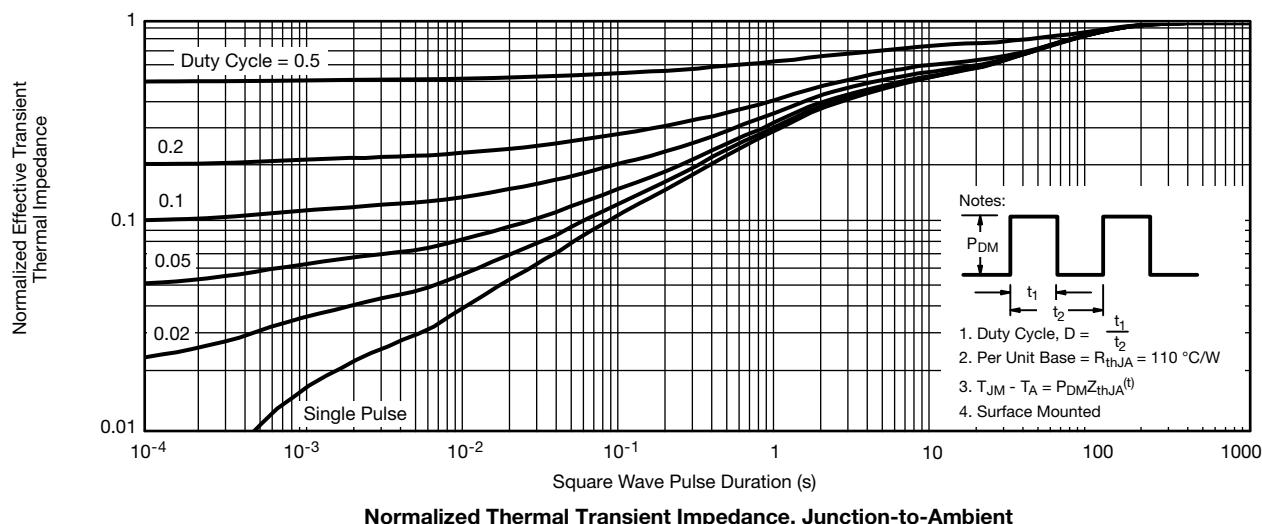
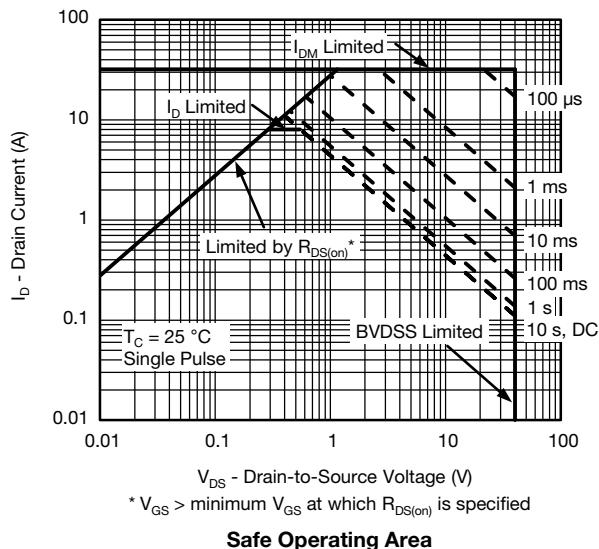
**Notes**

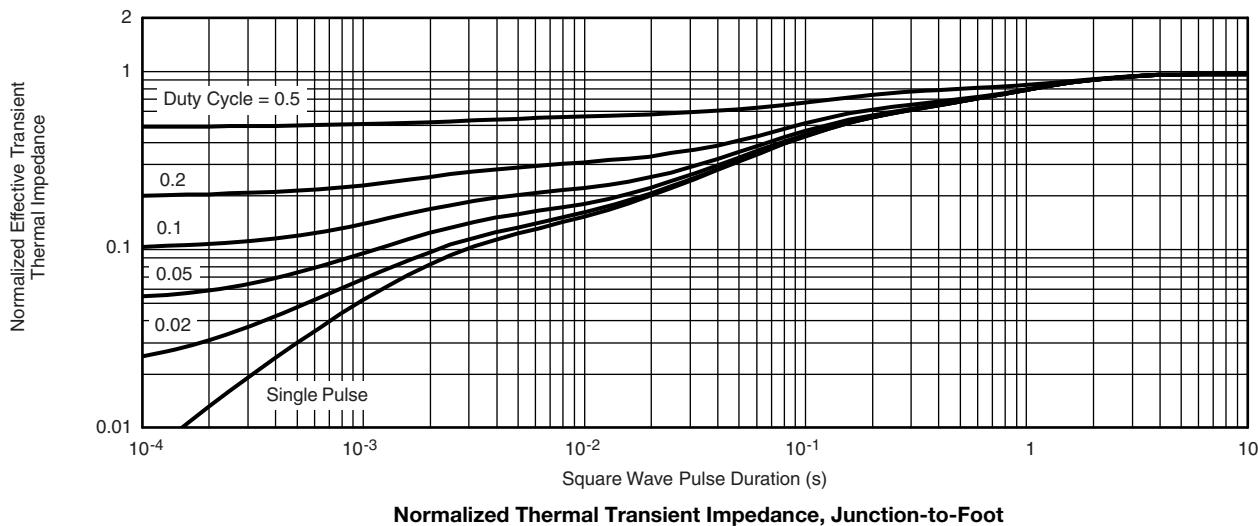
a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\text{ \%}$ .  
b. Guaranteed by design, not subject to production testing.  
c. Independent of operating temperature.

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


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


**THERMAL RATINGS** ( $T_A = 25$  °C, unless otherwise noted)

**Note**

- The characteristics shown in the two graphs

- Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
- Normalized Transient Thermal Impedance Junction-to-Foot (25 °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.

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