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Product Termination Notification

Product Group: SIL/Mon Nov 27, 2023/PTN-SIL-048-2023-REV-0



Conversion to Copper (Cu) Wire – SQ2361AEES

For further information, please contact your regional Vishay office.

CONTACT INFORMATION

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Description of Change: The affected part number listed in this notification will be converted to a Copper wire material set. The new ordering code is SQ2361CEES-T1_GE3, which has the exact same product performance and fit as SQ2361AEES. There will be no change to the wafer fab or assembly location (Note: parts with _BE3 suffix will be consolidated to a single assembly location at Simconix). There will be no changes to the parameters on the datasheet (reference: SQ2361CEES Doc # 62349 Rev.A).

Reason for Change: Standardization of materials

Expected Influence on Quality/Reliability/Performance: None

Part Numbers/Series/Families Affected: SQ2361AEES-T1_GE3, SQ2361AEES-T1_BE3,

Vishay Brand(S): Vishay Siliconix

Time Schedule:

Last Time Buy Date: Sun Jun 2, 2024

Last Time Ship Date: Mon Dec 2, 2024

Sample Availability: Qualified samples of replacement product are available on request

Product Identification: SQ2361CEES-T1_GE3

Qualification Data: AEC Q101 qualification data of replacement product is available. Qualification PPAP is available now.

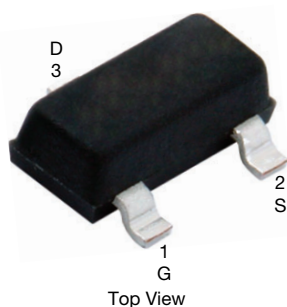
This PTN is considered approved, without further notification, unless we receive specific customer concerns before Sun Jun 2, 2024 or as specified by contract.

Issued By: Lance Gurrola, automostechsupport@vishay.com



Automotive P-Channel 60 V (D-S) 175 °C MOSFET

SOT-23 (TO-236)



Marking Code: 9Vxxx

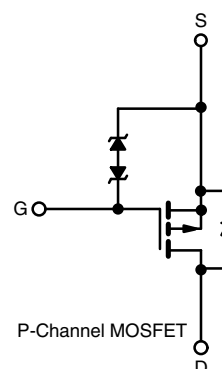
PRODUCT SUMMARY	
V_{DS} (V)	-60
$R_{DS(on)}$ (Ω) at $V_{GS} = -10$ V	0.170
$R_{DS(on)}$ (Ω) at $V_{GS} = -4.5$ V	0.230
I_D (A)	-2.8
Configuration	Single

FEATURES

- TrenchFET® power MOSFET
- Typical ESD protection: 800 V
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Material categorization:
for definitions of compliance please see
www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE



ORDERING INFORMATION	
Package	SOT-23
Lead (Pb)-free and halogen-free	SQ2361CEES (for detailed order number please see www.vishay.com/doc?79771)

ABSOLUTE MAXIMUM RATINGS ($T_C = 25$ °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	-60	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	$T_C = 25$ °C	I_D	-2.8	A
	$T_C = 125$ °C		-1.6	
Continuous source current (diode conduction)		I_S	-2.5	
Pulsed drain current ^a		I_{DM}	-11	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	-13	
Single pulse avalanche energy		E_{AS}	8.4	mJ
Maximum power dissipation	$T_C = 25$ °C	P_D	2	W
	$T_C = 125$ °C		0.67	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to +175	°C

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount ^b	R_{thJA}	175	°C/W
Junction-to-foot (drain)		R_{thJF}	75	

Notes

- a. Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %
b. When mounted on 1" square PCB (FR4 material)



SPECIFICATIONS (T _C = 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		-60	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA		-1.5	-	-2.5	
Gate-source leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V		-	-	± 30	mA
		V _{DS} = 0 V, V _{GS} = ± 8 V		-	-	± 2	
Zero gate voltage drain current	I _{DSS}	V _{GS} = 0 V	V _{DS} = -60 V	-	-	-1	μA
		V _{GS} = 0 V	V _{DS} = -60 V, T _J = 125 °C	-	-	-50	
		V _{GS} = 0 V	V _{DS} = -60 V, T _J = 175 °C	-	-	-150	
On-state drain current ^a	I _{D(on)}	V _{GS} = -10 V	V _{DS} ≤ -5 V	-10	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = -10 V	I _D = -2.4 A	-	0.130	0.170	Ω
		V _{GS} = -10 V	I _D = -2.4 A, T _J = 125 °C	-	-	0.300	
		V _{GS} = -10 V	I _D = -2.4 A, T _J = 175 °C	-	-	0.315	
		V _{GS} = -4.5 V	I _D = -1.8 A	-	0.180	0.230	
Forward transconductance ^b	g _{fs}	V _{DS} = -10 V, I _D = -2 A		-	5	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = -30 V, f = 1 MHz	-	415	620	pF
Output capacitance	C _{oss}			-	55	80	
Reverse transfer capacitance	C _{rss}			-	32	45	
Total gate charge ^c	Q _g	V _{GS} = -10 V	V _{DS} = -30 V, I _D = -6 A	-	10	15	nC
Gate-source charge ^c	Q _{gs}			-	1.5	-	
Gate-drain charge ^c	Q _{gd}			-	5	-	
Gate resistance	R _g	f = 1 MHz		2.15	4.3	6.45	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = -30 V, R _L = 20 Ω I _D ≅ -1.5 A, V _{GEN} = -10 V, R _g = 1 Ω		-	9	12	ns
Rise time ^c	t _r			-	9	12	
Turn-off delay time ^c	t _{d(off)}			-	24	30	
Fall time ^c	t _f			-	4	6	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	-11	A
Forward voltage	V _{SD}	I _F = -1.5 A, V _{GS} = 0 V		-	-0.8	-1.2	V
Body diode reverse recovery time	t _{rr}	I _F = -1.5 A, di/dt = 100 A/μs		-	23	46	ns
Body diode reverse recovery charge	Q _{rr}			-	25	50	nC
Reverse recovery fall time	t _a			-	20	-	
Reverse recovery rise time	t _b			-	3	-	
Body diode peak reverse recovery current	I _{RM(REC)}			-	-2.9	-	A

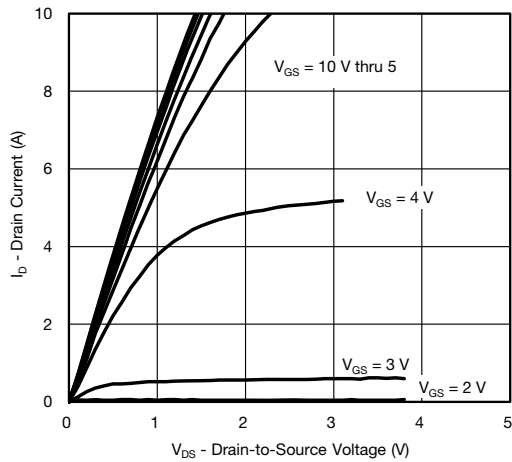
Notes

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

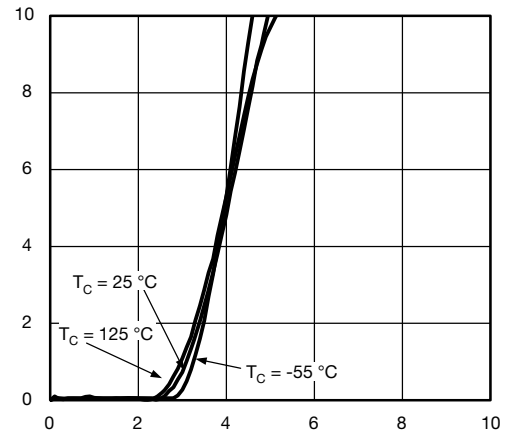
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



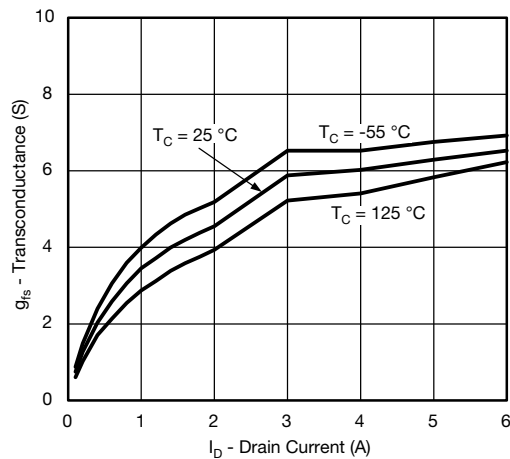
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



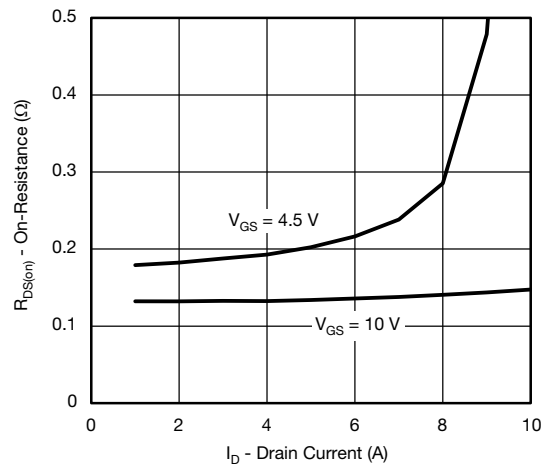
Output Characteristics



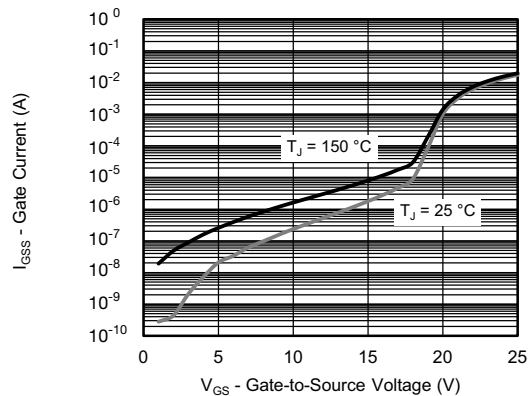
Transfer Characteristics



Transconductance



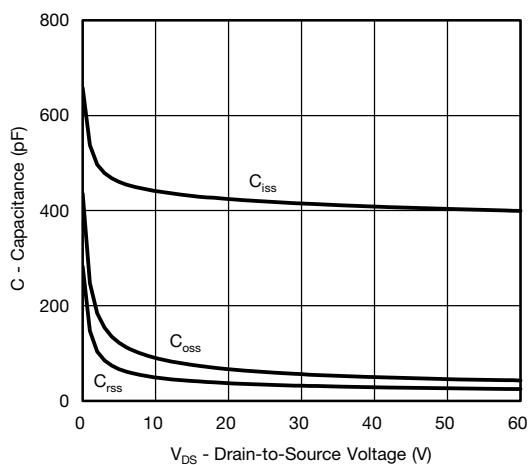
On-Resistance vs. Drain Current



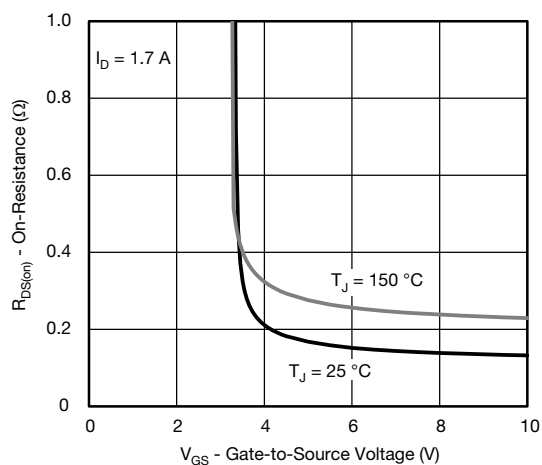
Gate Current vs. Gate-Source Voltage



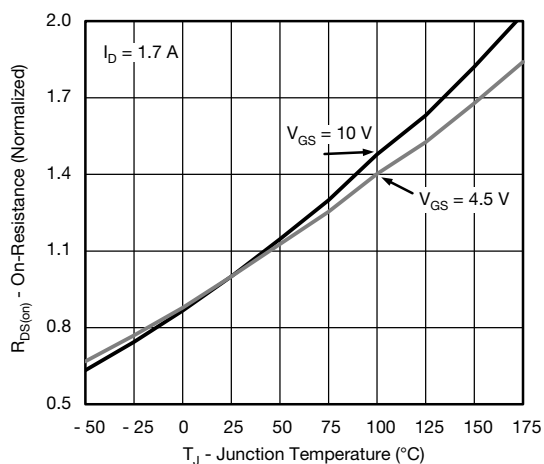
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



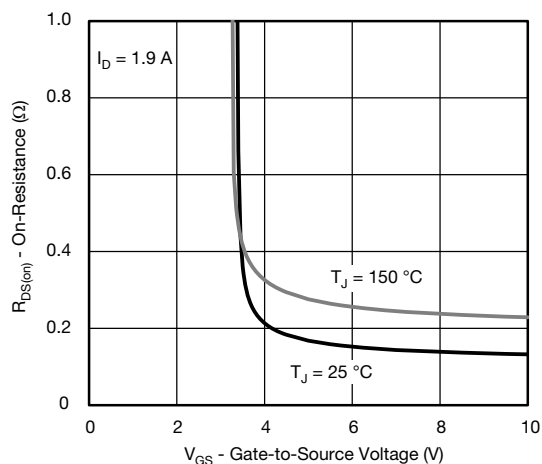
Capacitance



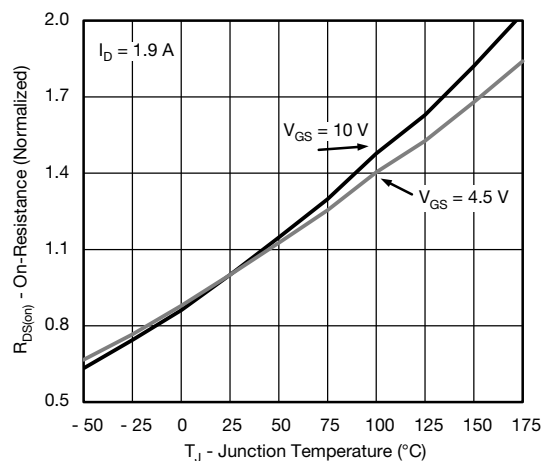
On-Resistance vs. Gate-Source Voltage



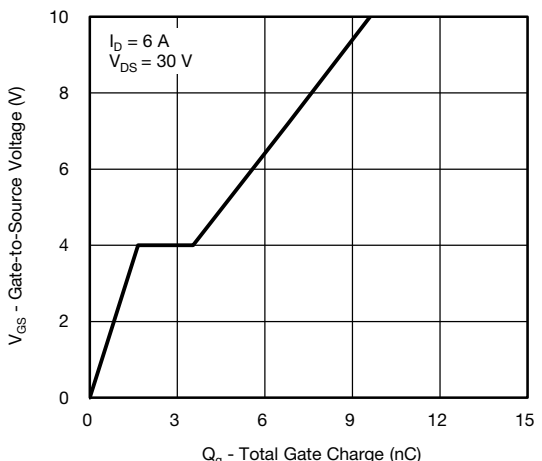
On-Resistance vs. Junction Temperature



On-Resistance vs. Gate-Source Voltage



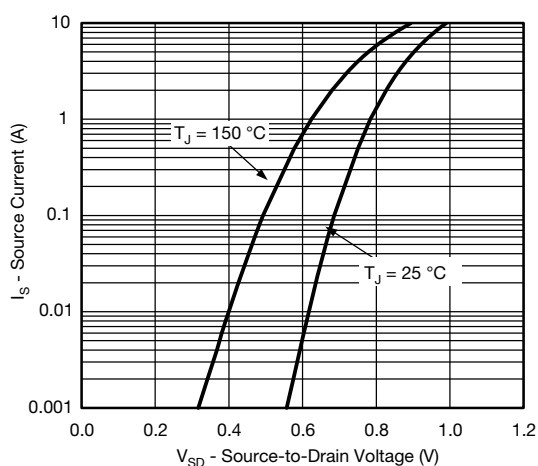
On-Resistance vs. Junction Temperature



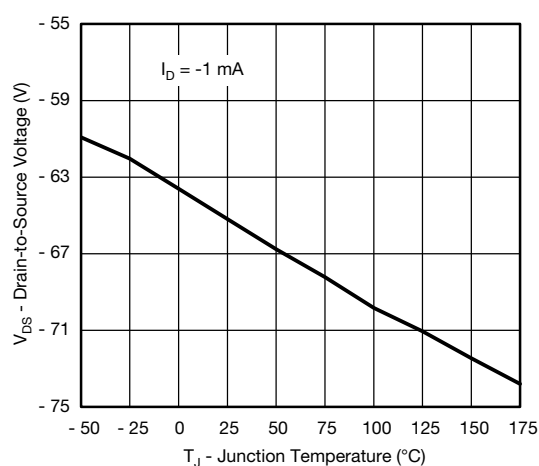
Gate Charge



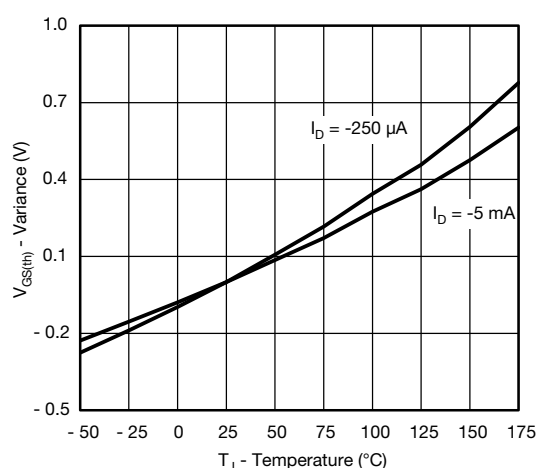
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



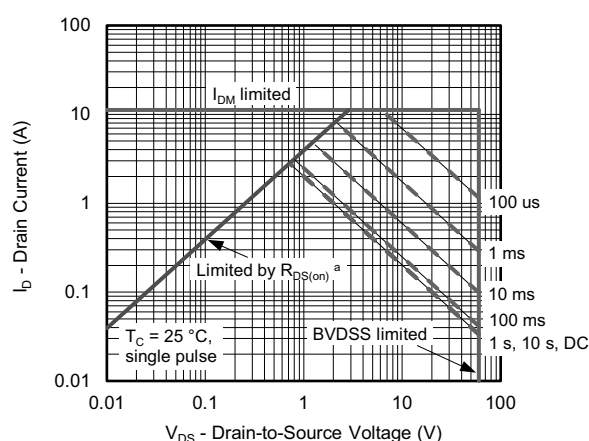
Source-Drain Diode Forward Voltage



Drain Source Breakdown vs. Junction Temperature



Threshold Voltage

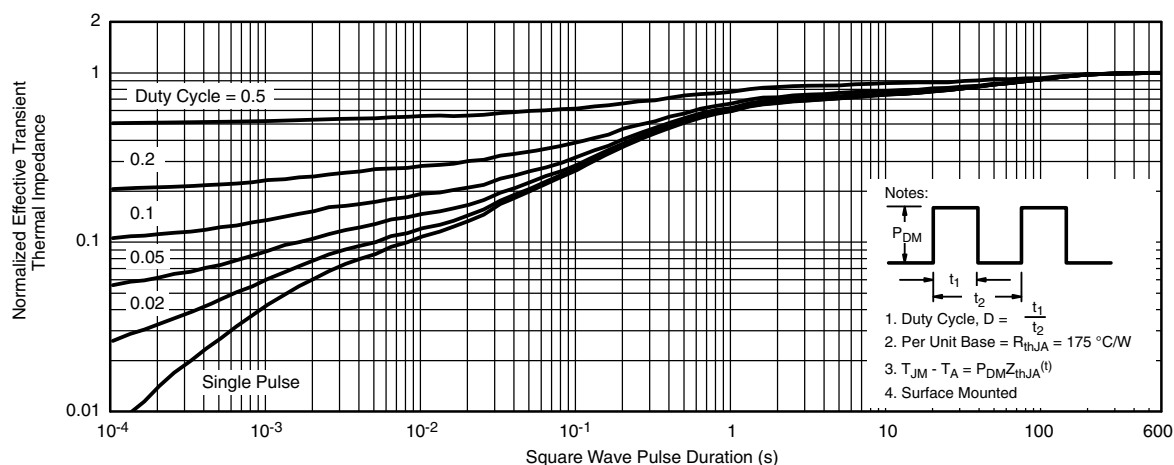


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

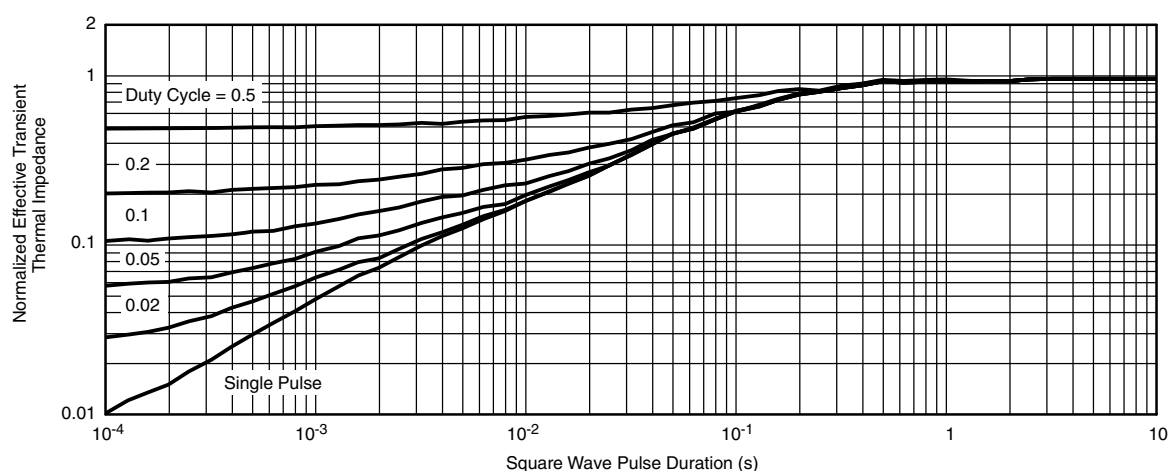
Safe Operating Area



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



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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-Foot ($25\text{ }^{\circ}\text{C}$)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



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