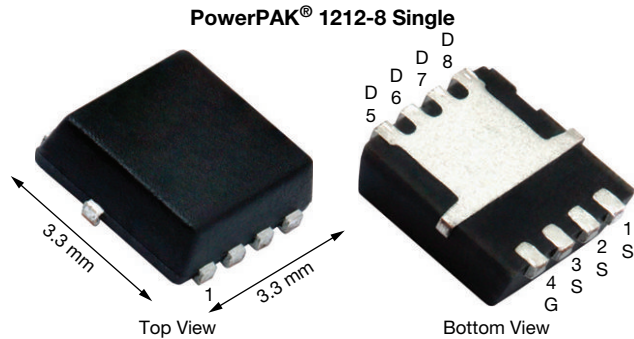


P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω) MAX.	I _D (A)	Q _g (TYP.)
-30	0.0150 at V _{GS} = -10 V	-18 ^e	16 nC
	0.0200 at V _{GS} = -6 V	-18 ^e	
	0.0260 at V _{GS} = -4.5 V	-18 ^e	


Ordering Information:

Si7121ADN-T1-GE3 (Lead (Pb)-free and Halogen-free)

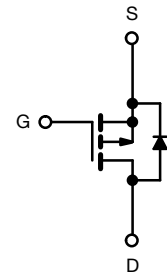
FEATURES

- TrenchFET[®] Power MOSFET
- Low thermal resistance PowerPAK[®] package
- 100 % R_g and UIS tested
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912


RoHS
 COMPLIANT
 HALOGEN
 FREE

APPLICATIONS

- Notebook computers and mobile computing
 - Adaptor switch / Load switch
 - Battery management
 - Power management



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	-30	V
Gate-Source Voltage	V _{GS}	± 25	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	-18 ^e
		T _C = 70 °C	-18 ^e
		T _A = 25 °C	-12 ^{a,b}
		T _A = 70 °C	-9.6 ^{a,b}
Pulsed Drain Current (t = 100 μs)	I _{DM}	-50	A
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	
		T _A = 25 °C	-2.9 ^{a,b}
Avalanche Current	I _{AS}	L = 0.1 mH	-14
Single-Pulse Avalanche Energy			E _{AS}
Maximum Power Dissipation	P _D	T _C = 25 °C	27.8
		T _C = 70 °C	17.8
		T _A = 25 °C	3.5 ^{a,b}
		T _A = 70 °C	2.2 ^{a,b}
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-50 to 150	°C
Soldering Recommendations (Peak Temperature) ^{c,d}		260	

Notes

- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- See solder profile (www.vishay.com/doc?73257). The PowerPAK 1212-8 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.
- Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.
- Package limited.

**THERMAL RESISTANCE RATINGS**

PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient ^{a,b}	$t \leq 10$ s	R_{thJA}	29	36	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	3.3	4.5	

Notes

- a. Surface mounted on 1" x 1" FR4 board.
b. Maximum under steady state conditions is 81 °C/W.

SPECIFICATIONS ($T_J = 25$ °C, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0$ V, $I_D = -250$ μ A	-30	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250$ μ A	-	-23	-	mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		-	4.8	-	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250$ μ A	-1.2	-	-2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0$ V, $V_{GS} = \pm 25$ V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30$ V, $V_{GS} = 0$ V	-	-	-1	μ A
		$V_{DS} = -30$ V, $V_{GS} = 0$ V, $T_J = 55$ °C	-	-	-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5$ V, $V_{GS} = -10$ V	-20	-	-	A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10$ V, $I_D = -7$ A	-	0.0125	0.0150	Ω
		$V_{GS} = -6$ V, $I_D = -5$ A	-	0.0160	0.0200	
		$V_{GS} = -4.5$ V, $I_D = -3$ A	-	0.0210	0.0260	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15$ V, $I_D = -7$ A	-	52	-	S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{DS} = -15$ V, $V_{GS} = 0$ V, $f = 1$ MHz	-	1870	-	pF
Output Capacitance	C_{oss}		-	245	-	
Reverse Transfer Capacitance	C_{rss}		-	212	-	
Total Gate Charge	Q_g	$V_{DS} = -15$ V, $V_{GS} = -10$ V, $I_D = -12$ A	-	33	50	nC
Gate-Source Charge	Q_{gs}	$V_{DS} = -15$ V, $V_{GS} = -4.5$ V, $I_D = -12$ A	-	16	25	
Gate-Drain Charge	Q_{gd}		-	5.6	-	
Gate Resistance	R_g		$f = 1$ MHz	0.64	3.2	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15$ V, $R_L = 1.6$ Ω $I_D \cong -9.6$ A, $V_{GEN} = -4.5$ V, $R_g = 1$ Ω	-	38	57	ns
Rise Time	t_r		-	34	51	
Turn-Off Delay Time	$t_{d(off)}$		-	24	36	
Fall Time	t_f		-	10	20	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15$ V, $R_L = 1.6$ Ω $I_D \cong -9.6$ A, $V_{GEN} = -10$ V, $R_g = 1$ Ω	-	8	16	
Rise Time	t_r		-	9	18	
Turn-Off Delay Time	$t_{d(off)}$		-	22	33	
Fall Time	t_f		-	7	14	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	-	-	-18 ^c	A
Pulse Diode Forward Current ^d	I_{SM}		-	-	-50	
Body Diode Voltage	V_{SD}	$I_F = -9.6$ A	-	-0.8	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -9.6$ A, $di/dt = 100$ A/ μ s, $T_J = 25$ °C	-	21	32	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	12	20	nC
Reverse Recovery Fall Time	t_a		-	11	-	ns
Reverse Recovery Rise Time	t_b		-	10	-	

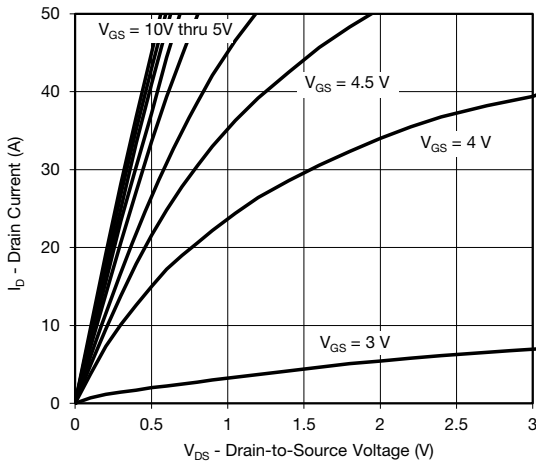
Notes

- a. Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Package limited.
d. $t = 100$ μ s.

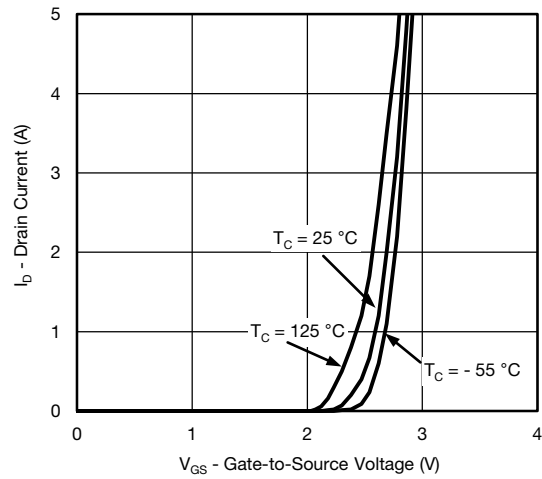
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



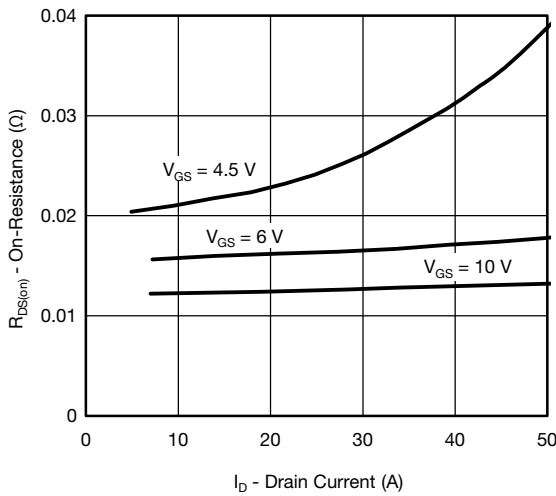
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



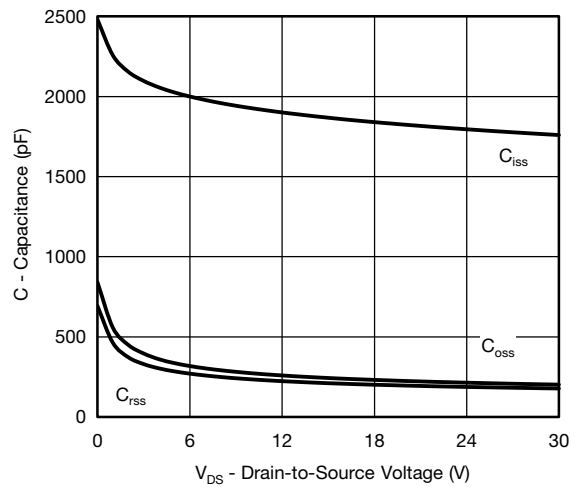
Output Characteristics



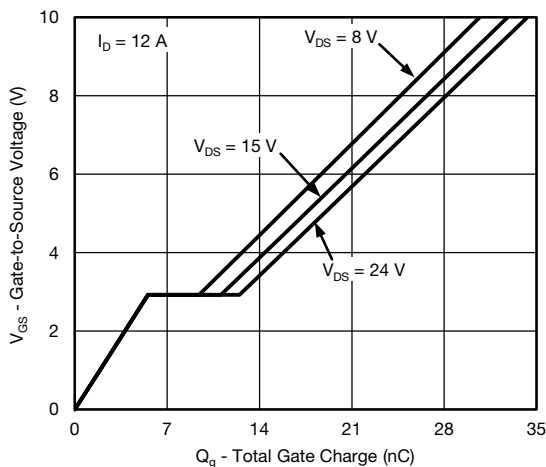
Transfer Characteristics



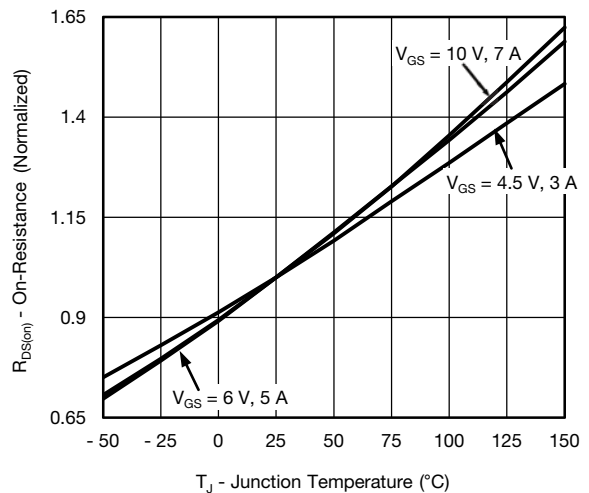
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



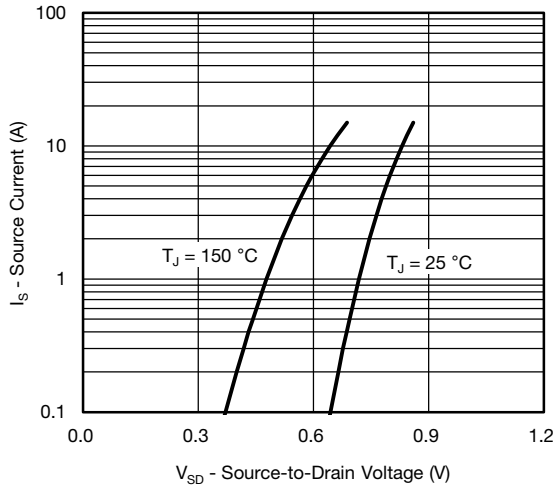
Gate Charge



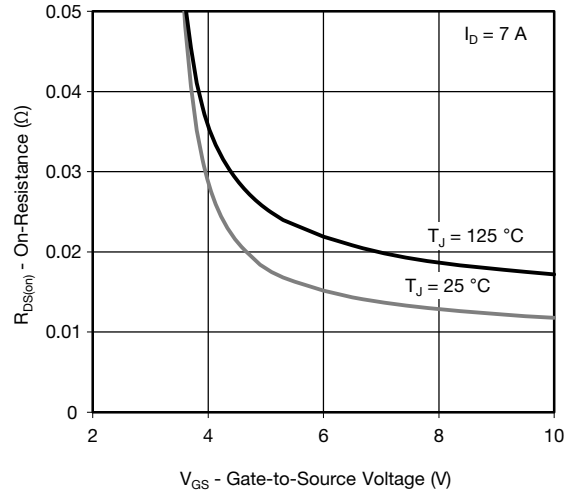
On-Resistance vs. Junction Temperature



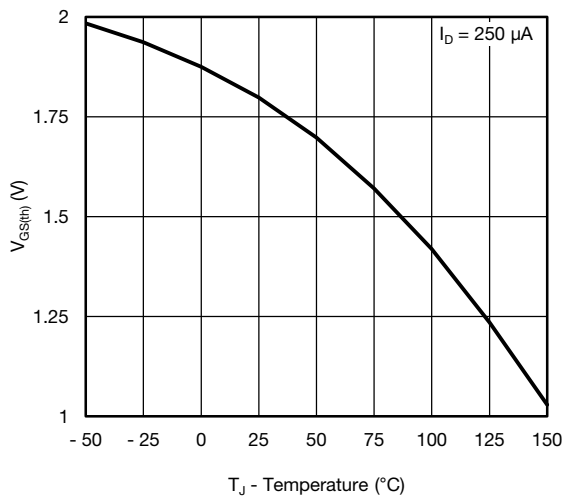
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



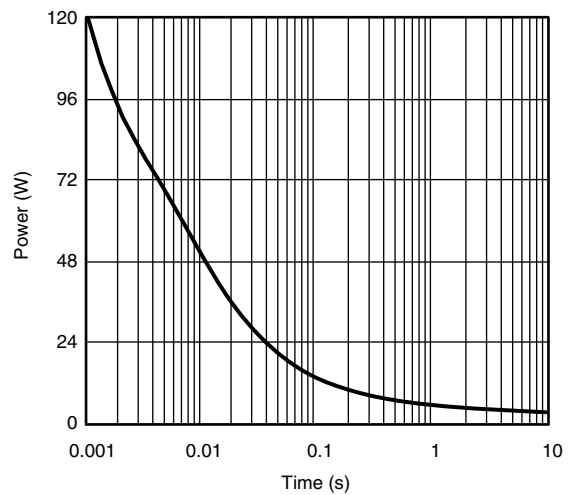
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



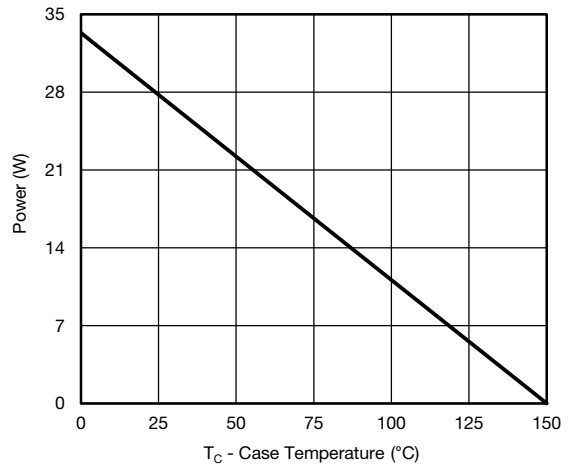
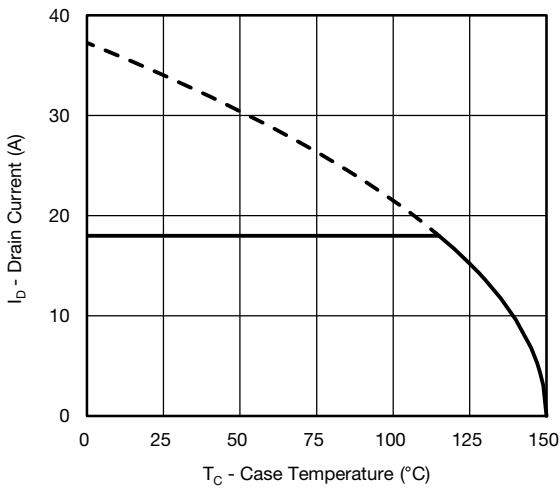
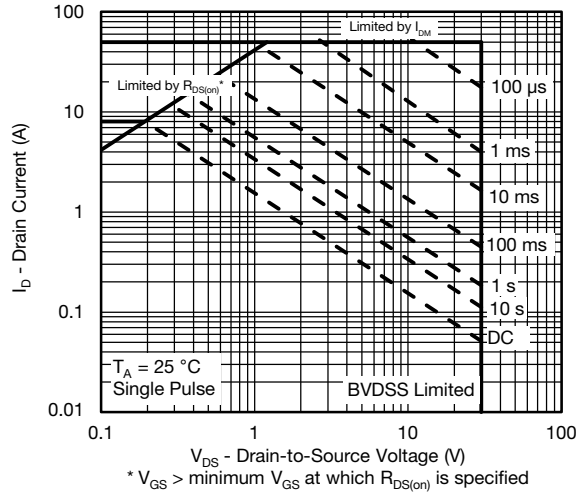
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



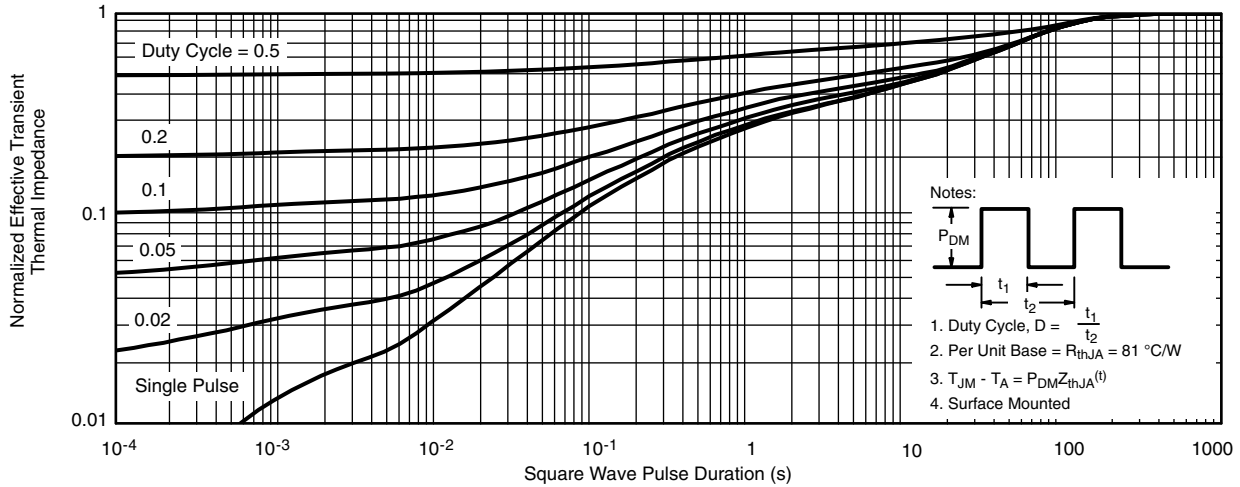
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



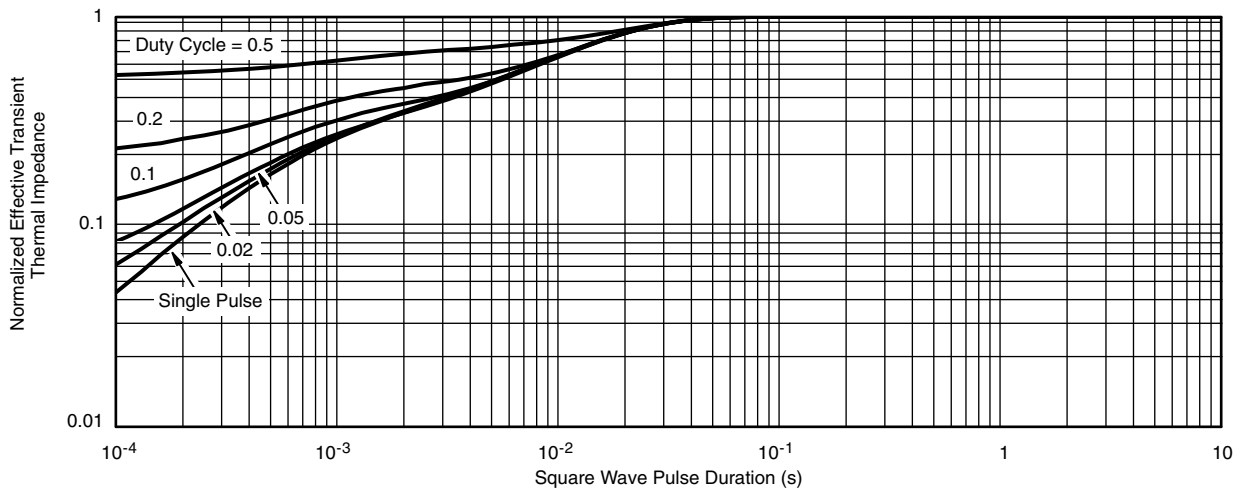
* The power dissipation P_D is based on $T_{J(max.)} = 150\text{ °C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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