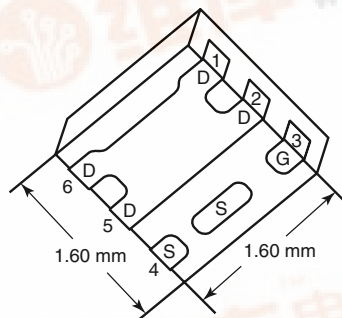


P-Channel 20-V (D-S) MOSFET

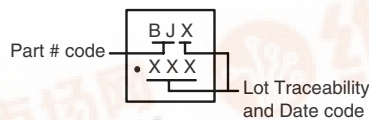
PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)
- 20	0.035 at V _{GS} = - 4.5 V	- 9 ^a	13 nC
	0.049 at V _{GS} = - 2.5 V	- 9 ^a	
	0.072 at V _{GS} = - 1.8 V	- 9 ^a	
	0.130 at V _{GS} = - 1.5 V	- 2	

PowerPAK SC-75-6L-Single



Marking Code



Ordering Information: SiB457EDK-T1-GE3 (Lead (Pb)-free and Halogen-free)

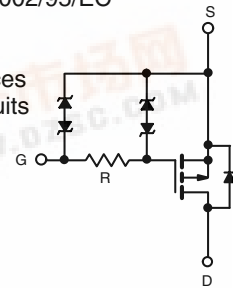
FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET® Power MOSFET
- New Thermally Enhanced PowerPAK® SC-75 Package
 - Small Footprint Area
 - Low On-Resistance
- 100 % R_g Tested
- Typical ESD Performance: 2500 V
- Built in ESD Protection with Zener Diode
- Compliant to RoHS Directive 2002/95/EC

RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Load Switch for Portable Devices
- Load Switch for Charging Circuits



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	- 20	V
Gate-Source Voltage	V _{GS}	± 8	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	A
		T _C = 70 °C	
		T _A = 25 °C	
		T _A = 70 °C	
Pulsed Drain Current	I _{DM}	- 25	A
Continuous Source-Drain Diode Current	I _S	- 9 ^a	
		- 2 ^{b, c}	
Maximum Power Dissipation	P _D	T _C = 25 °C	W
		T _C = 70 °C	
		T _A = 25 °C	
		T _A = 70 °C	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature) ^{d, e}		260	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, f}	R _{thJA}	41	51	°C/W
Maximum Junction-to-Case (Drain)	R _{thJC}	7.5	9.5	

Notes:

- Package limited.
- Surface Mounted on 1" x 1" FR4 board.
- t = 5 s.
- See Solder Profile (www.vishay.com/ppg?73257). The PowerPAK SC-75 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.
- Maximum under Steady State conditions is 105 °C/W.

SiB457EDK


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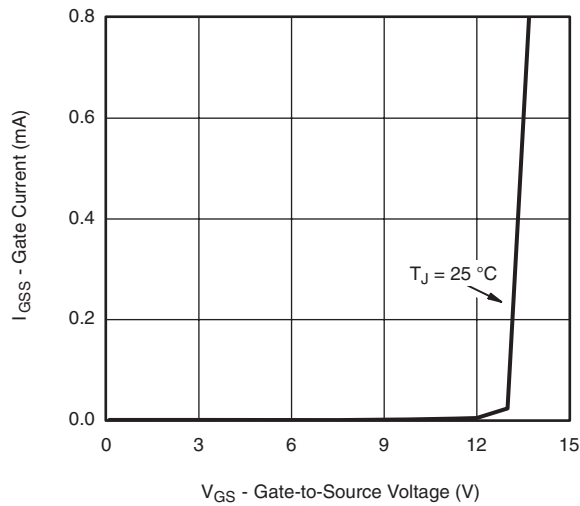
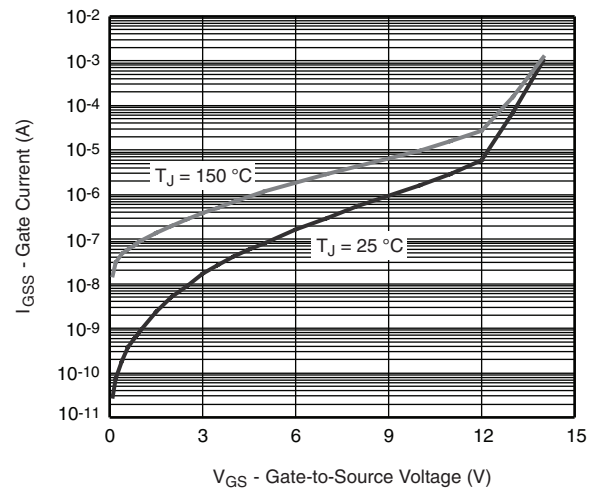
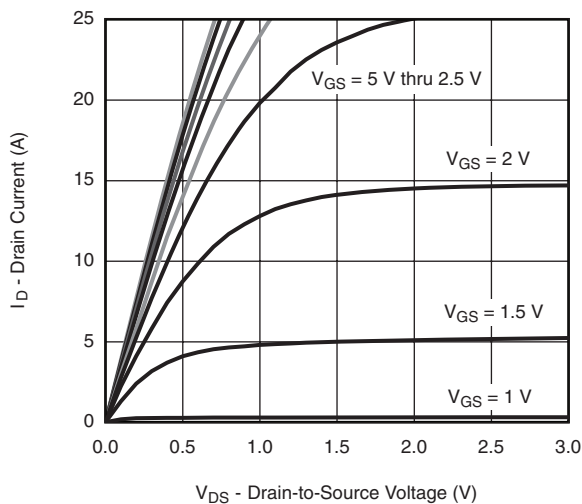
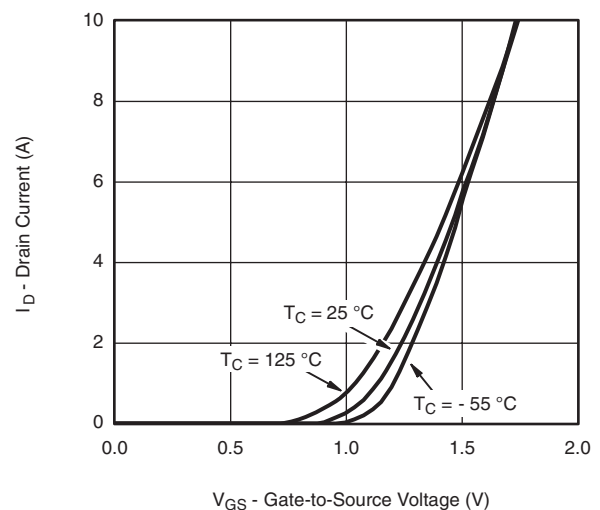
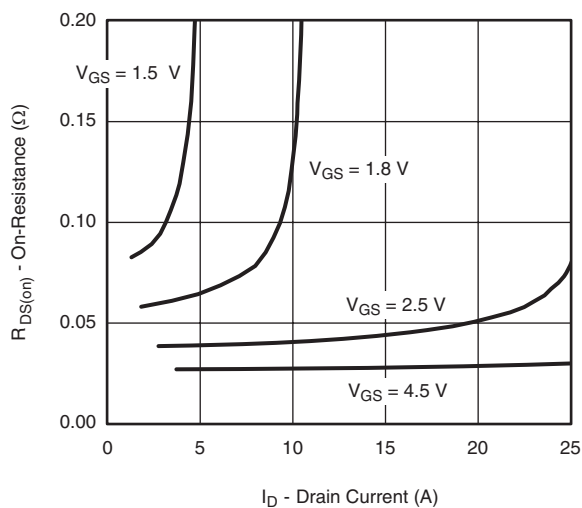
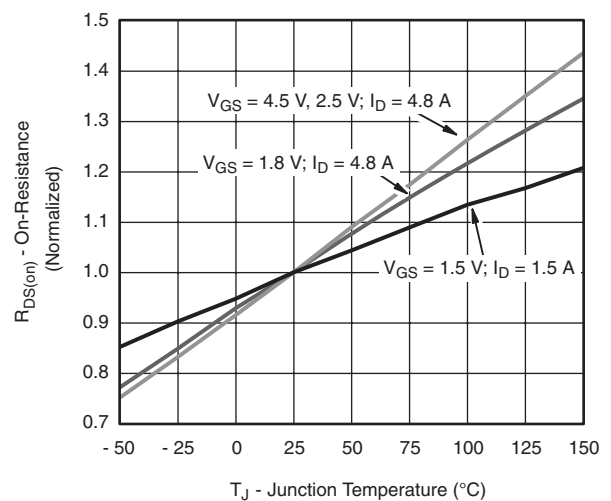
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = -250\text{ }\mu\text{A}$	- 20			V	
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		- 12		mV/ $^{\circ}\text{C}$	
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			2.5			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	- 0.4		- 1	V	
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 8\text{ V}$			± 5	μA	
		$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 4.5\text{ V}$			± 0.5		
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20\text{ V}$, $V_{GS} = 0\text{ V}$			- 1		
		$V_{DS} = -20\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			- 10		
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}$, $V_{GS} = -4.5\text{ V}$	- 15			A	
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}$, $I_D = -4.8\text{ A}$		0.029	0.035	Ω	
		$V_{GS} = -2.5\text{ V}$, $I_D = -4.0\text{ A}$		0.040	0.049		
		$V_{GS} = -1.8\text{ V}$, $I_D = -3.3\text{ A}$		0.060	0.072		
		$V_{GS} = -1.5\text{ V}$, $I_D = -1.5\text{ A}$		0.085	0.130		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}$, $I_D = -4.8\text{ A}$		16		S	
Dynamic ^b							
Total Gate Charge	Q_g	$V_{DS} = -10\text{ V}$, $V_{GS} = -8\text{ V}$, $I_D = -6.8\text{ A}$		22	44	nC	
Gate-Source Charge		$V_{DS} = -10\text{ V}$, $V_{GS} = -4.5\text{ V}$, $I_D = -6.8\text{ A}$		13	26		
	Q_{gs}			1.2			
Gate-Drain Charge	Q_{gd}			3			
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.28	1.4	2.8	k Ω	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V}$, $R_L = 1.8\text{ }\Omega$ $I_D \cong -5.5\text{ A}$, $V_{GEN} = -4.5\text{ V}$, $R_g = 1\text{ }\Omega$		0.34	0.51	μs	
Rise Time	t_r			0.90	1.35		
Turn-Off Delay Time	$t_{d(off)}$			3.00	4.50		
Fall Time	t_f			1.90	2.90		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10\text{ V}$, $R_L = 1.8\text{ }\Omega$ $I_D \cong -5.5\text{ A}$, $V_{GEN} = -8\text{ V}$, $R_g = 1\text{ }\Omega$		0.17	0.26		
Rise Time	t_r			0.45	0.70		
Turn-Off Delay Time	$t_{d(off)}$			5.5	8.30		
Fall Time	t_f			2.00	3.50		
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^{\circ}\text{C}$			- 9	A	
Pulse Diode Forward Current	I_{SM}				- 25		
Body Diode Voltage	V_{SD}	$I_S = -5.5\text{ A}$, $V_{GS} = 0\text{ V}$		- 0.85	- 1.2	V	

Notes:

a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

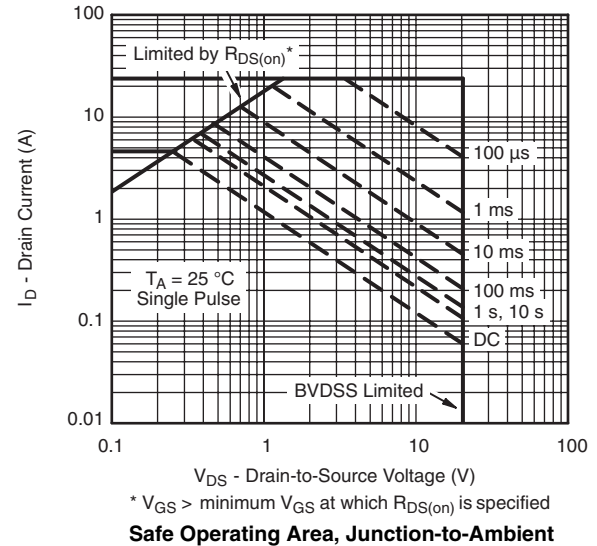
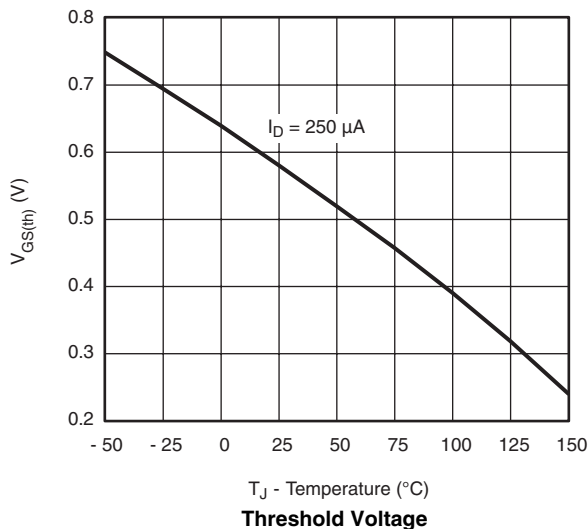
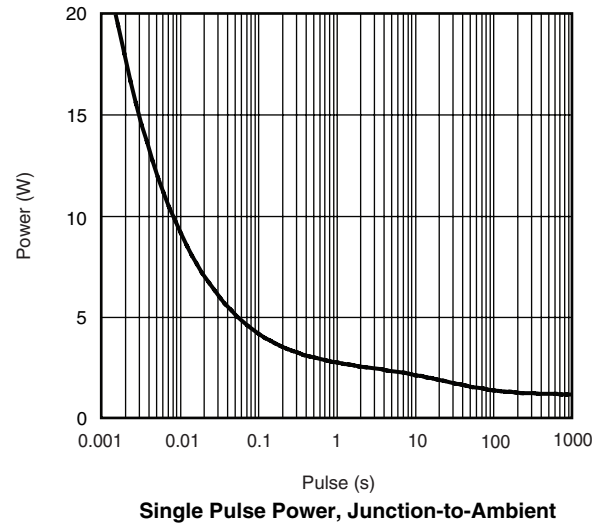
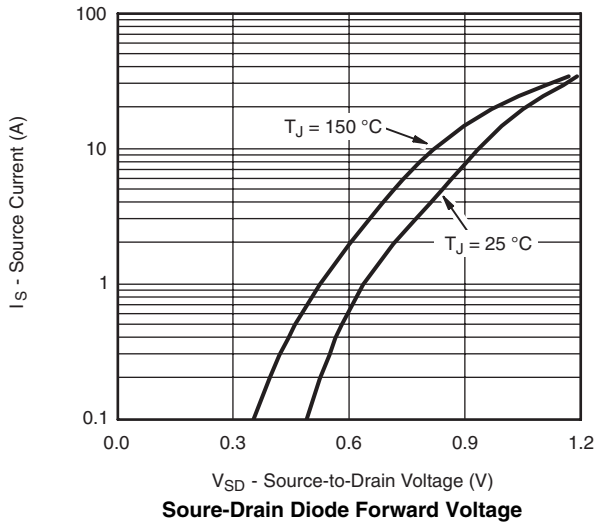
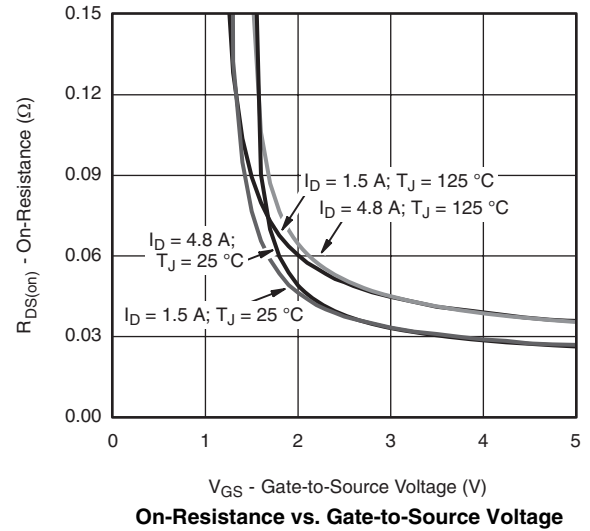
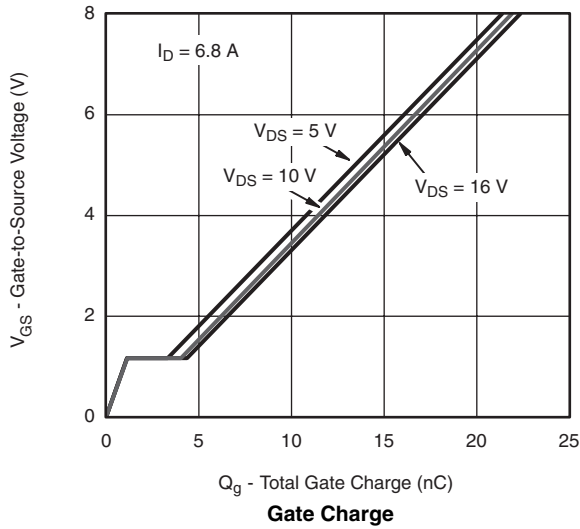
b. Guaranteed by design, not subject to production testing.

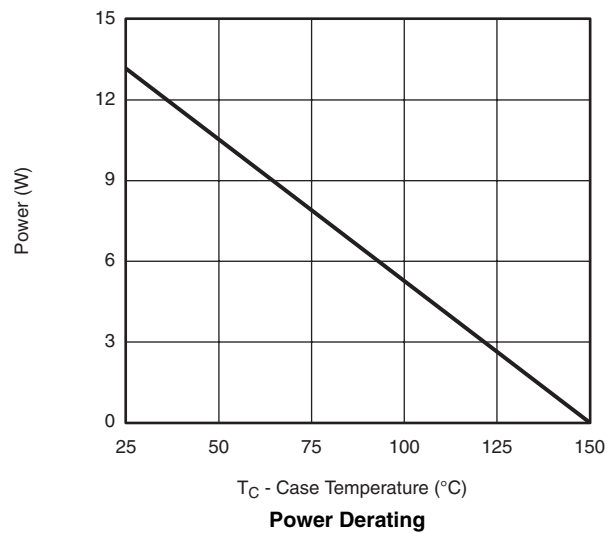
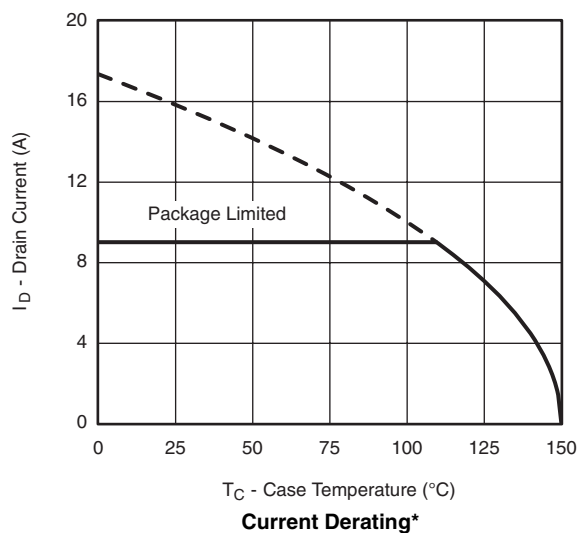
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

Gate Current vs. Gate-Source Voltage

Gate Current vs. Gate-Source Voltage

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

On-Resistance vs. Junction Temperature

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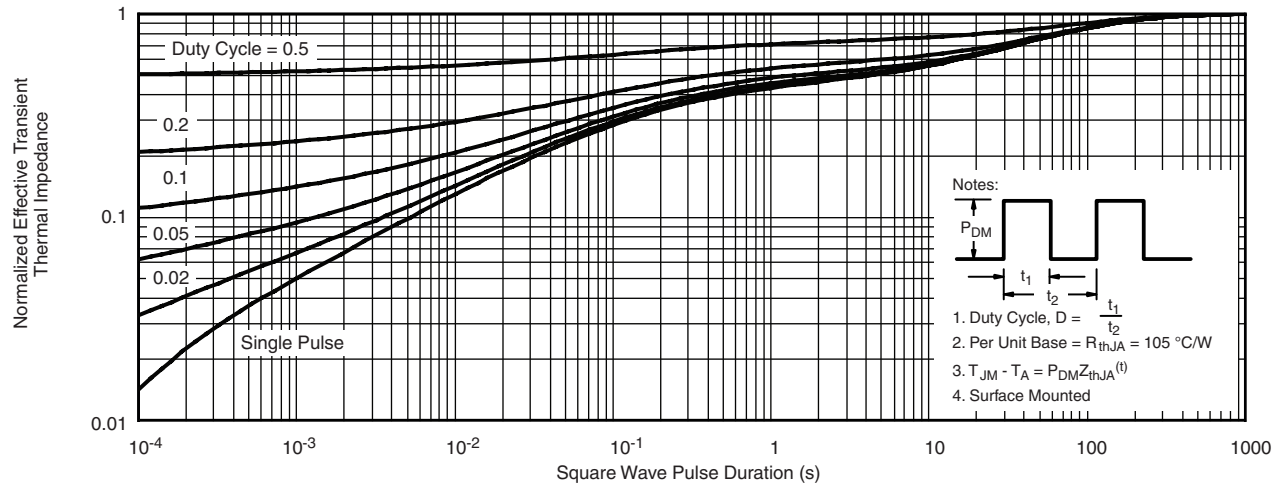
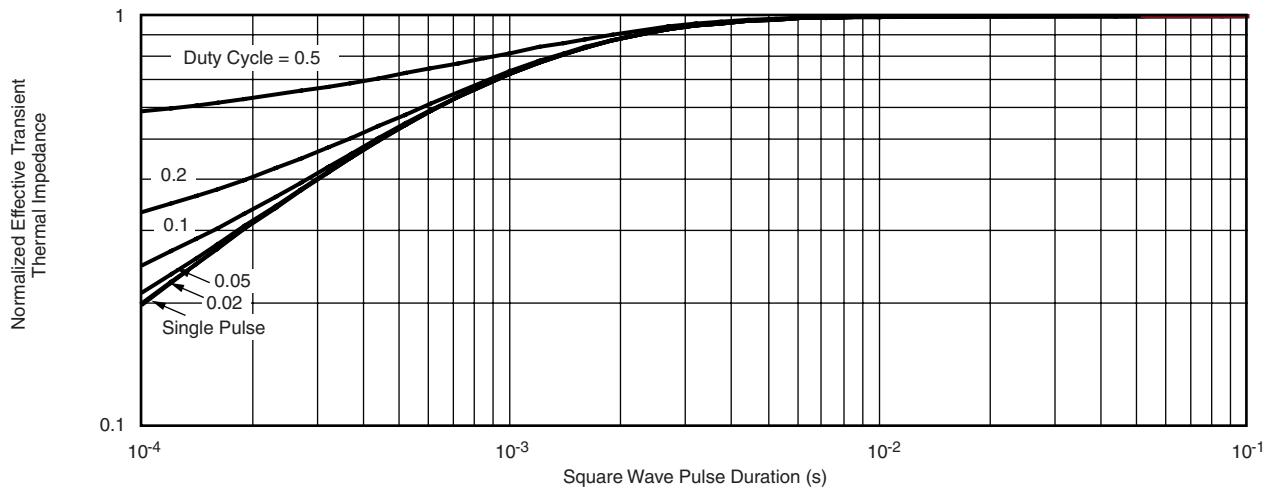
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


* The power dissipation P_D is based on $T_{J(max)} = 150$ °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.

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**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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