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[Vishay/Siliconix](#)
[SUD50N10-18P-GE3](#)

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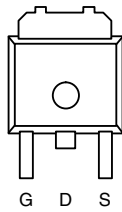
SUD50N10-18P-GE3

Vishay Siliconix

N-Channel 100 V (D-S), 150 °C MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^a	Q _g (Typ.)
100	0.0185 at V _{GS} = 10 V	50	48 nC

TO-252



Drain Connected to Tab

Top View

Ordering Information:
 SUD50N10-18P-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

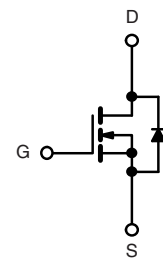
- TrenchFET[®] Power MOSFET
- 100 % R_g and UIS Tested
- Material categorization:
 For definitions of compliance please see www.vishay.com/doc?99912



RoHS
 COMPLIANT
 HALOGEN
 FREE

APPLICATIONS

- Primary Side Switch
- Isolated DC/DC Converter



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	100	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	50 ^a	A
		T _C = 100 °C	33.4	
		T _A = 25 °C	7.8 ^b	
		T _A = 100 °C	5 ^b	
Pulsed Drain Current	I _{DM}	100		
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	50 ^a	
		T _A = 25 °C	1.7 ^b	
Single Pulse Avalanche Current	I _{AS}	45		
Avalanche Energy	E _{AS}	101	mJ	
Maximum Power Dissipation	P _D	T _C = 25 °C	113.6	W
		T _C = 100 °C	45.5	
		T _A = 25 °C	2.5 ^b	
		T _A = 100 °C	1 ^b	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^b	R _{thJA}	40	50	°C/W
Maximum Junction-to-Case				

Notes:
 a. Package limited.
 b. Surface mounted on 1" x 1" FR4 board.

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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 μA	100			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		110		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 12.5		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.5		5	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			1	μA
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	50			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 15 A		0.0150	0.0185	Ω
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 15 A		33		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1 MHz		2600		pF
Output Capacitance	C _{oss}			230		
Reverse Transfer Capacitance	C _{rss}			80		
Total Gate Charge	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 50 A		48	75	nC
Gate-Source Charge	Q _{gs}			16		
Gate-Drain Charge	Q _{gd}			13		
Gate Resistance	R _g	f = 1 MHz		1.6	2.5	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 50 V, R _L = 1 Ω I _D ≅ 50 A, V _{GEN} = 10 V, R _g = 1 Ω		12	20	ns
Rise Time	t _r			10	20	
Turn-Off Delay Time	t _{d(off)}			18	35	
Fall Time	t _f			8	15	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode	I _S	T _C = 25 °C			50	A
Pulse Diode Forward Current ^a	I _{SM}				100	
Body Diode Voltage	V _{SD}	I _S = 15 A		0.85	1.5	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 50 A, dI/dt = 100 A/μs, T _J = 25 °C		80	120	ns
Body Diode Reverse Recovery Charge	Q _{rr}			160	240	nC
Reverse Recovery Fall Time	t _a			57		ns
Reverse Recovery Rise Time	t _b			23		

Notes:

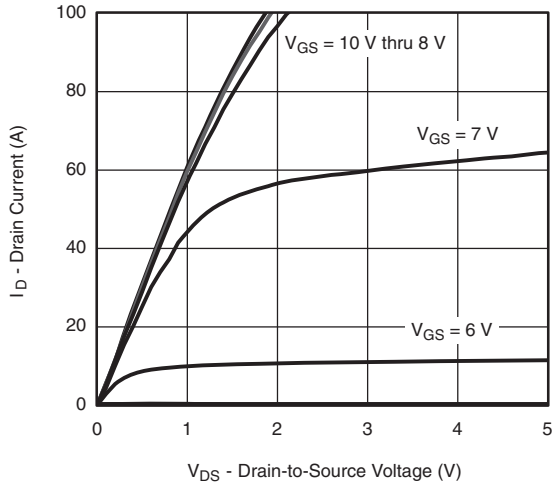
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
- b. Guaranteed by design, not subject to production testing.

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.

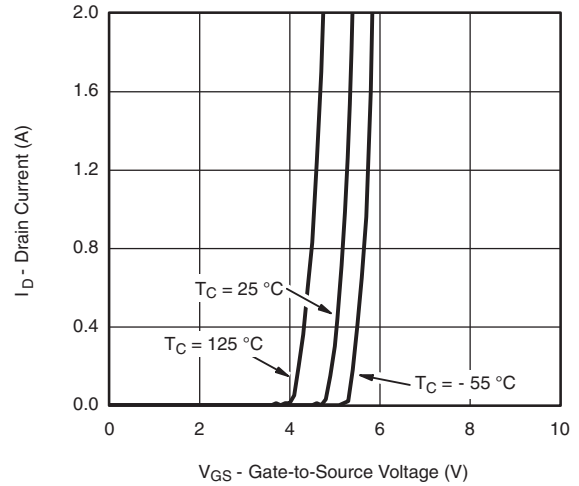


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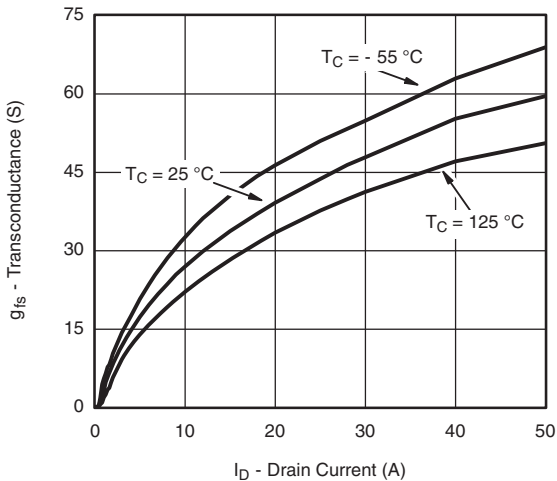
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



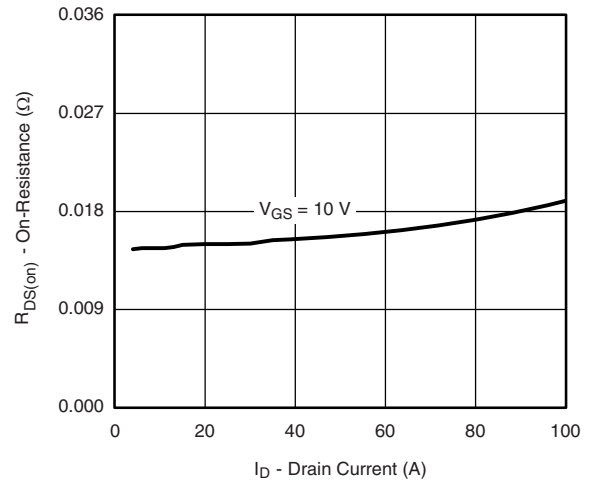
Output Characteristics



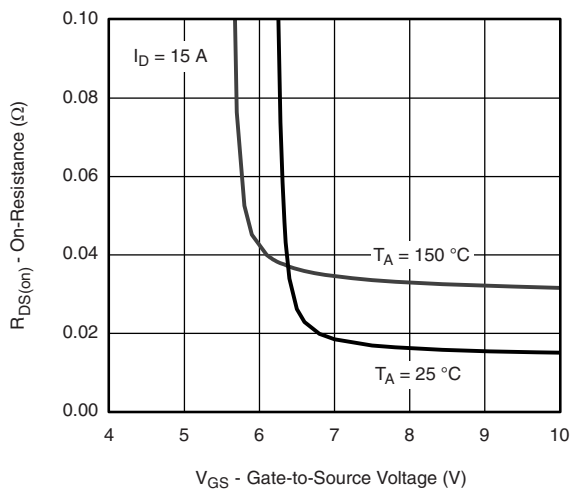
Transfer Characteristics



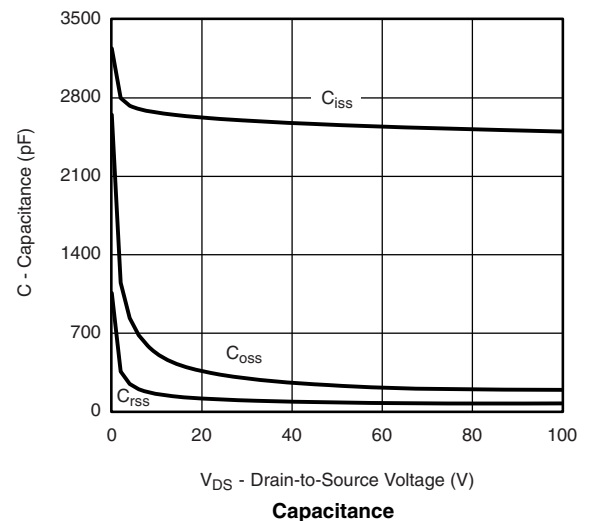
Transconductance



On-Resistance vs. Drain Current



On-Resistance vs. Gate-to-Source Voltage



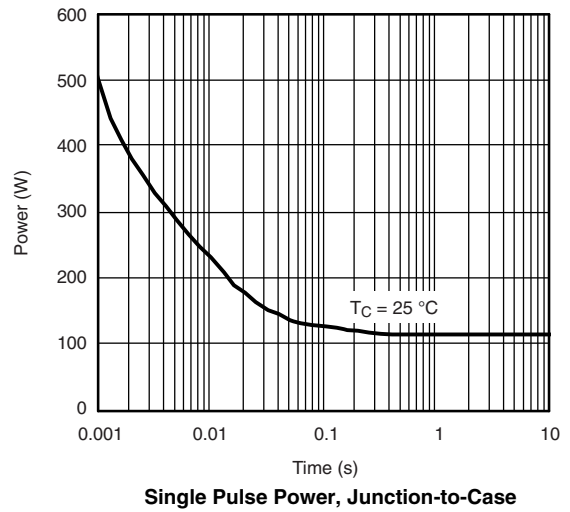
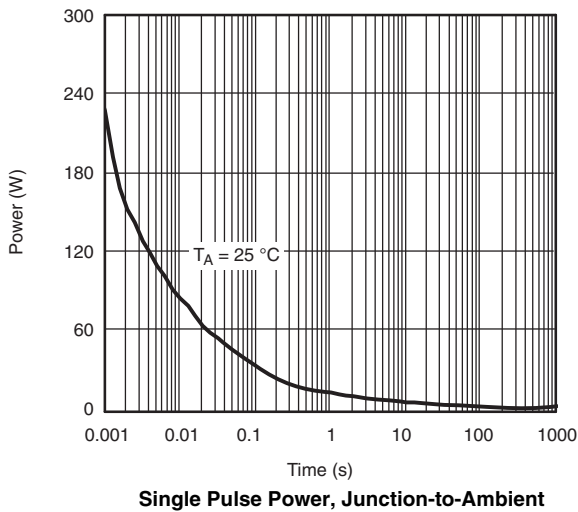
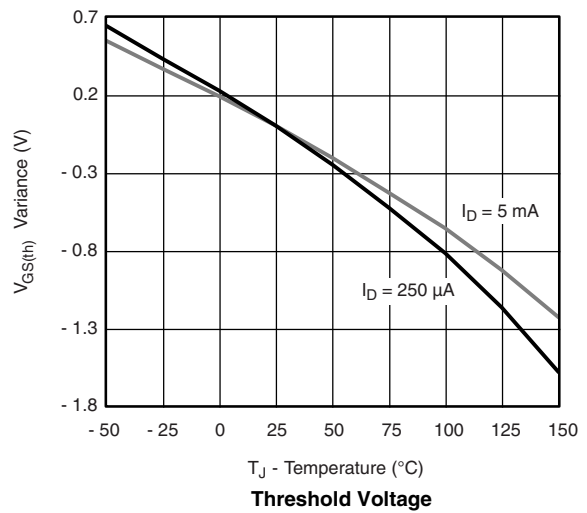
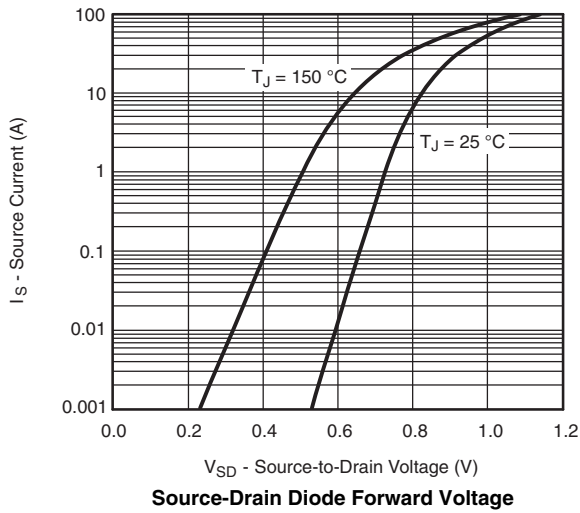
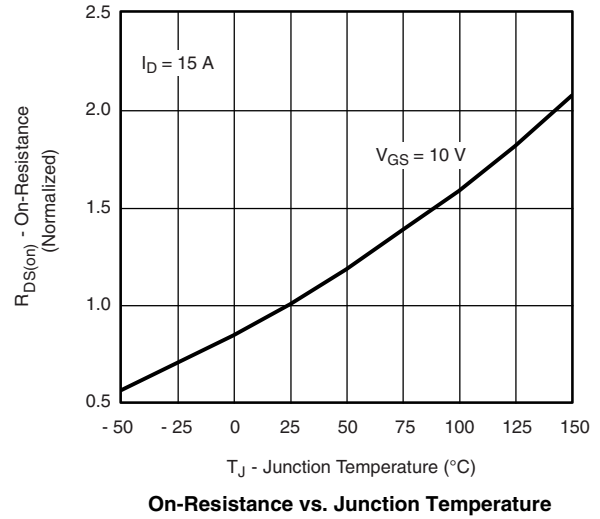
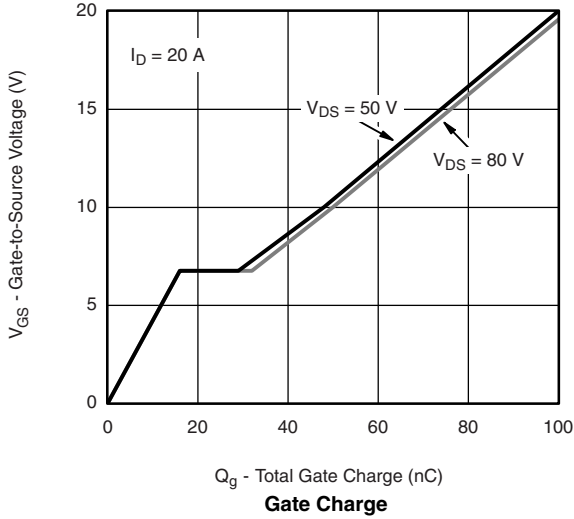
Capacitance

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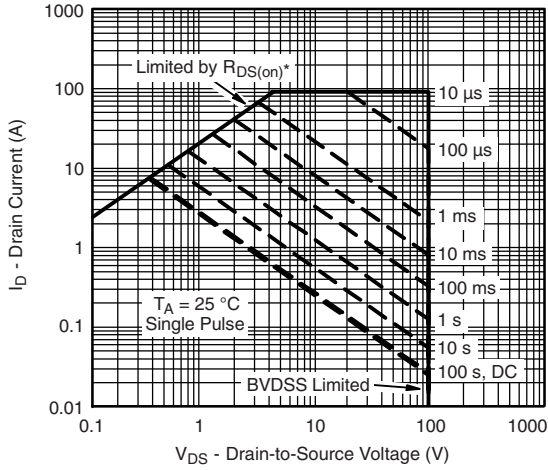
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





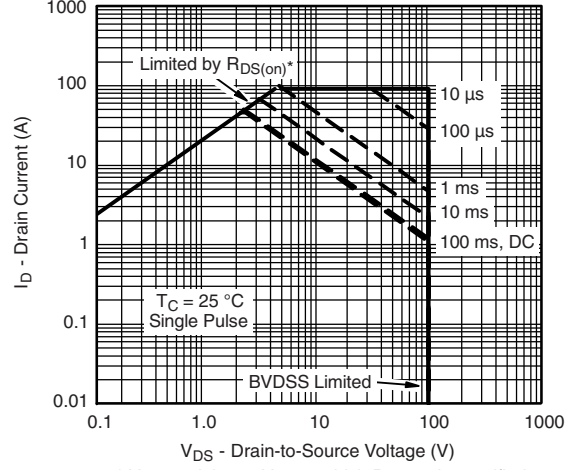
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



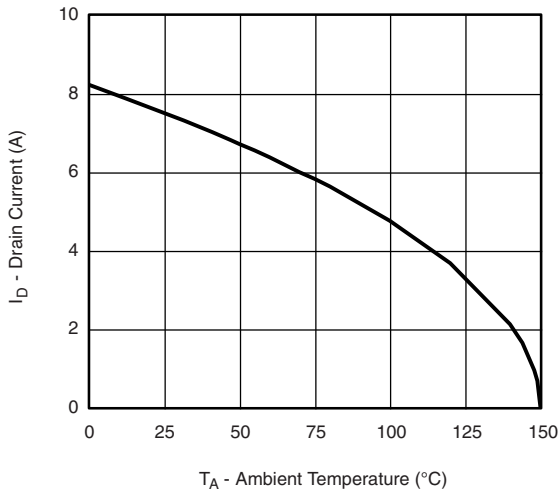
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

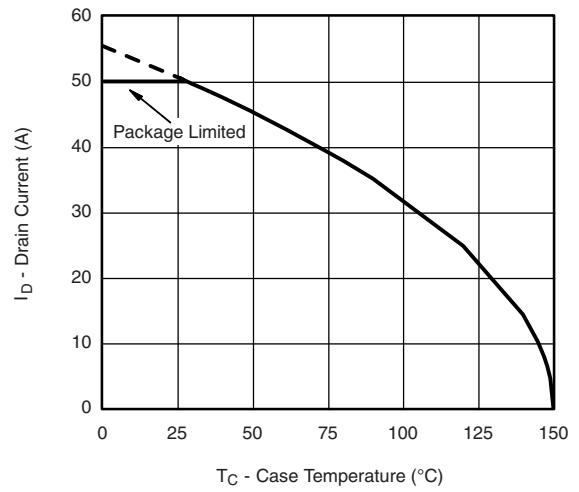


* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Case



Current Derating, Junction-to-Ambient**



Current Derating, Junction-to-Case**

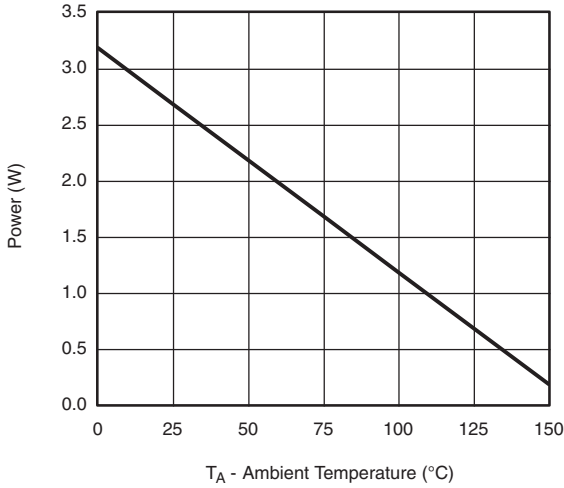
** The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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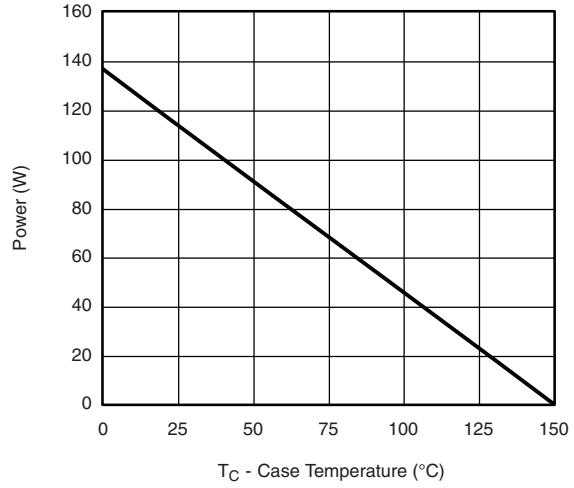
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Power Derating (Junction-to-Ambient)**



Power Derating (Junction-to-Case)**

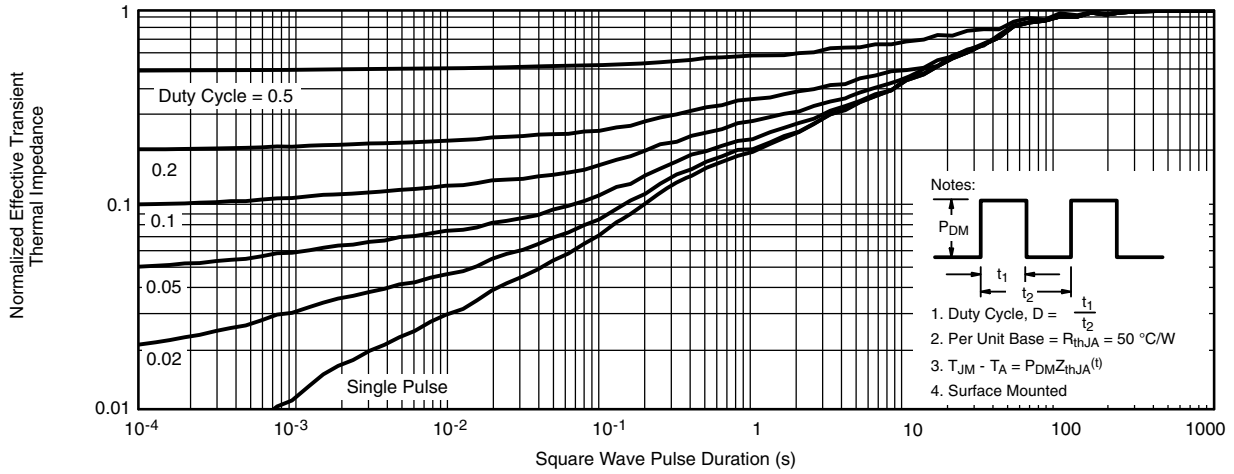
** The power dissipation P_D is based on T_{J(max)} = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



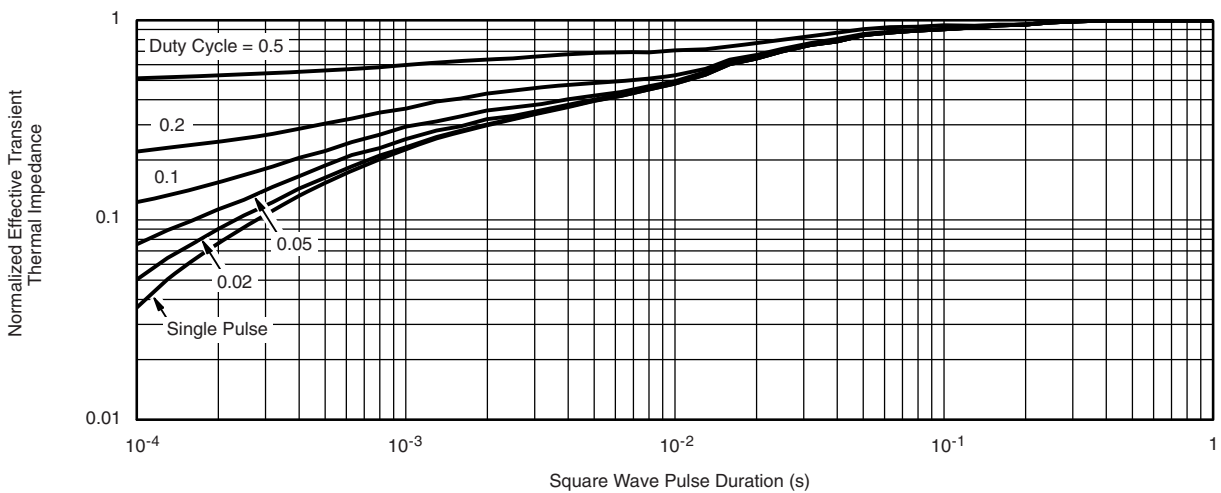
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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