



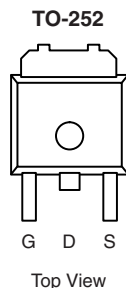
P-Channel 100-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY

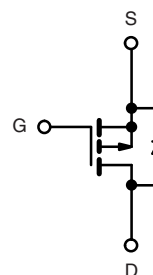
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ)
- 100	0.043 at $V_{GS} = - 10$ V	- 37	54 nC
	0.048 at $V_{GS} = - 4.5$ V	- 35	

FEATURES

- TrenchFET® Power MOSFET

RoHS
COMPLIANT

Drain Connected to Tab



Ordering Information: SUD50P10-43L-E3 (Lead (Pb)-free)

P-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 ($T_J = 175$ °C) ^b	$T_C = 25$ °C	- 37.1 ^a	A
	$T_C = 125$ °C	- 31 ^a	
	$T_A = 25$ °C	- 9.2 ^{b, c}	
	$T_A = 125$ °C	- 7.7 ^{b, c}	
Pulsed Drain Current	I_{DM}	- 40	
Continuous Source Current (Diode Conduction)	$T_C = 25$ °C	- 50 ^a	
	$T_A = 25$ °C	- 6.9 ^{b, c}	
Avalanche Current	I_{AS}	- 35	mJ
Single Pulse Avalanche Energy	E_{AS}	61	
Maximum Power Dissipation	$T_C = 25$ °C	136	W
	$T_C = 70$ °C	95	
	$T_A = 25$ °C	8.3 ^{b, c}	
	$T_A = 70$ °C	5.8 ^{b, c}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	R_{thJA}	15	18	°C/W
		40	50	
Junction-to-Case (Drain)	R_{thJC}	0.85	1.1	

Notes:

a. Package limited.

b. Surface Mounted on 1" x 1" FR4 Board.

c. $t = 10$ sec.

d. Maximum under Steady State conditions is 40 °C/W.

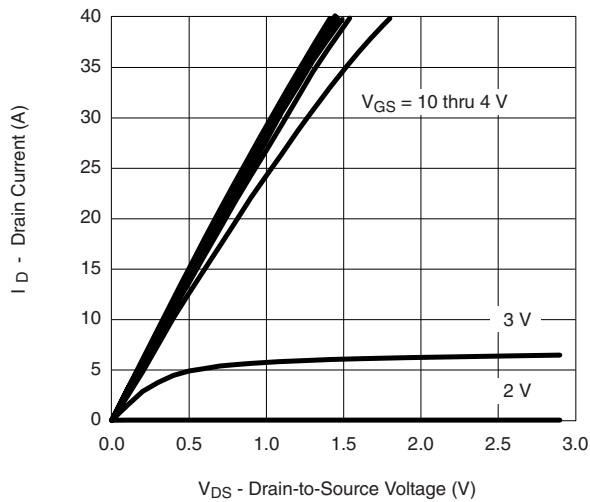
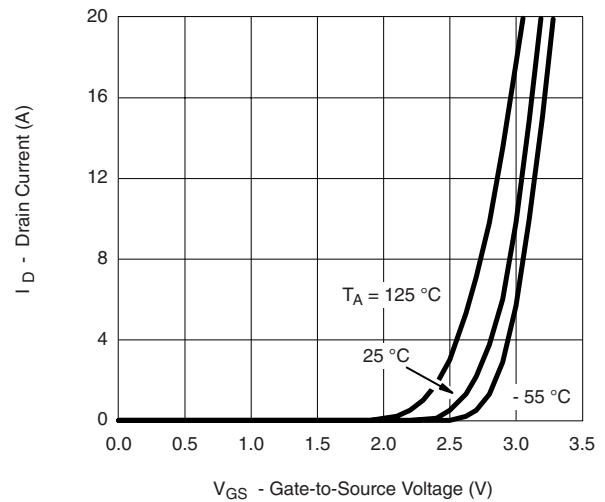
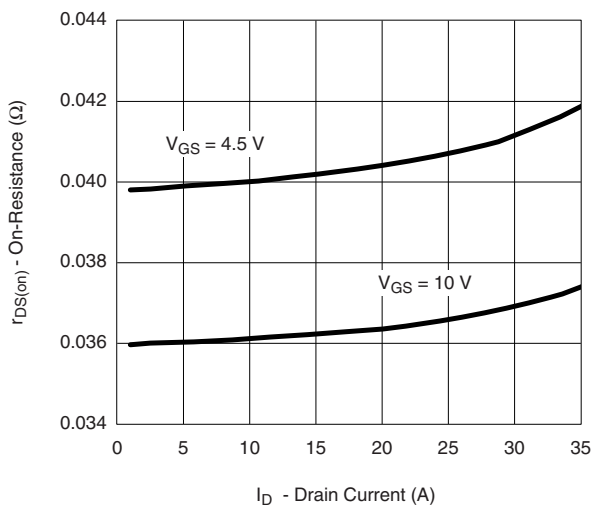
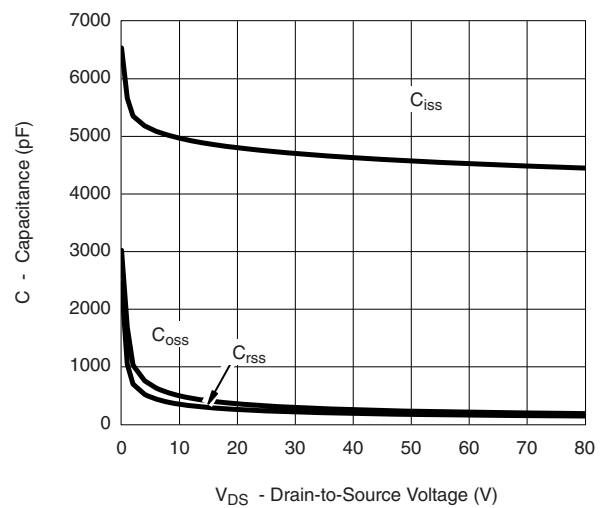
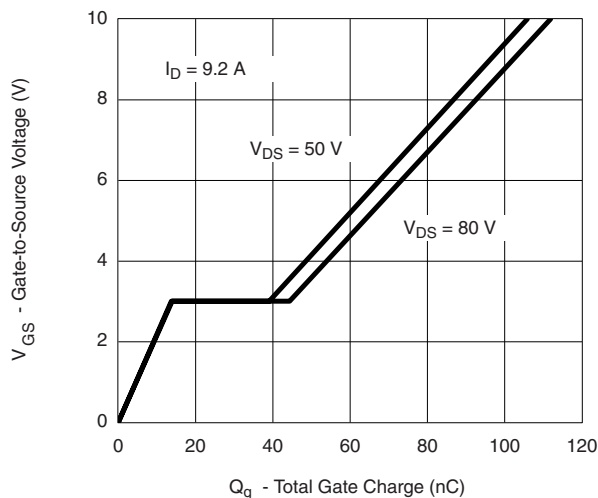
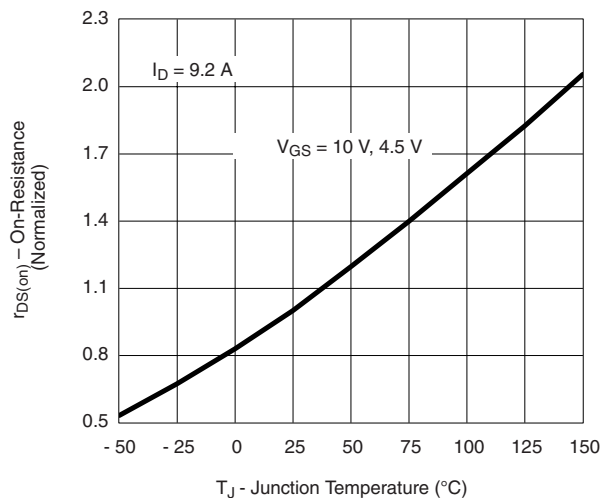
SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 100			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 109		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			5.9		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1		- 3	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 = 55 °C			- 10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = - 10 V	- 40			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = - 10 V, I _D = - 9.2 A		0.036	0.043	Ω
		V _{GS} = - 4.5 V, I _D = - 7.7 A		0.040	0.048	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 15 V, I _D = - 9.2 A		38		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 50 V, V _{GS} = 0 V, f = 1 MHz		4600		pF
Output Capacitance	C _{oss}			230		
Reverse Transfer Capacitance	C _{rss}			175		
Total Gate Charge	Q _g	V _{DS} = - 50 V, V _{GS} = - 10 V, I _D = - 9.2 A		106	160	nC
		V _{DS} = - 50 V, V _{GS} = - 4.5 V, I _D = - 9.2 A		54	81	
Gate-Source Charge	Q _{gs}			14		
Gate-Drain Charge	Q _{gd}			26		
Gate Resistance	R _g	f = 1 MHz		4		Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 50 V, R _L = 6.5 Ω I _D ≅ - 7.7 A, V _{GEN} = - 10 V, R _g = 1 Ω		15	25	ns
Rise Time	t _r			20	30	
Turn-Off Delay Time	t _{d(off)}			110	165	
Fall Time	t _f			100	150	
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 50 V, R _L = 6.5 Ω I _D ≅ - 7.7 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		42	65	ns
Rise Time	t _r			160	240	
Turn-Off Delay Time	t _{d(off)}			100	150	
Fall Time	t _f			100	150	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 50	A
Pulse Diode Forward Current ^a	I _{SM}				- 40	
Body Diode Voltage	V _{SD}	I _S = - 7.7 A		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 7.7 A, di/dt = 100 A/μs, T _J = 25 °C		60	90	ns
Body Diode Reverse Recovery Charge	Q _{rr}			150	225	nC
Reverse Recovery Fall Time	t _a			46		ns
Reverse Recovery Rise Time	t _b			14		

Notes:

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

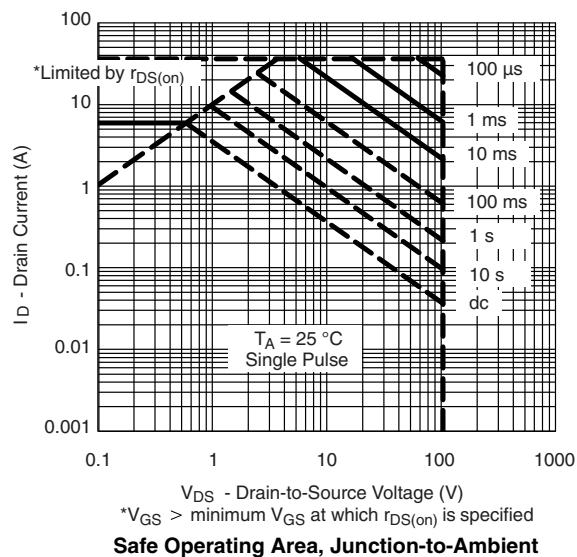
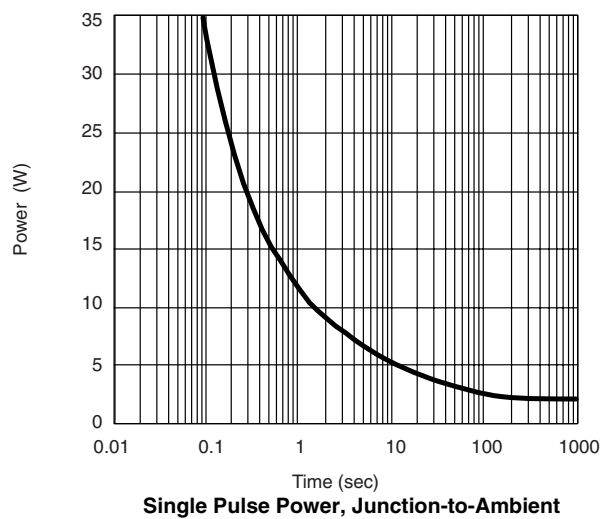
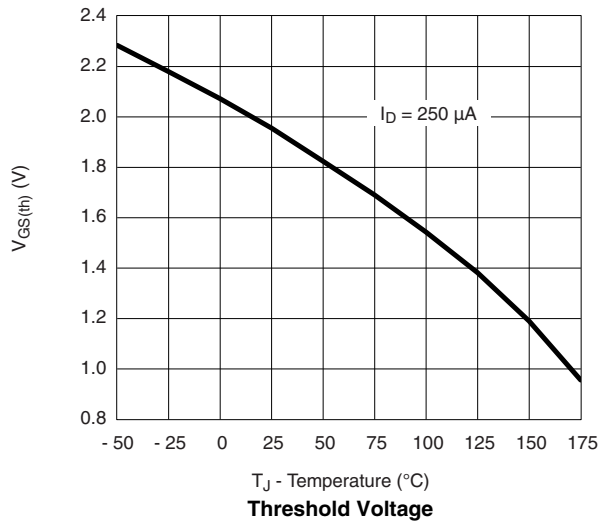
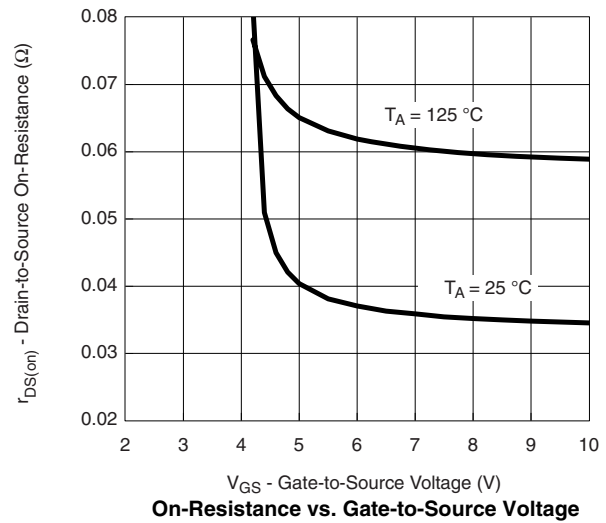
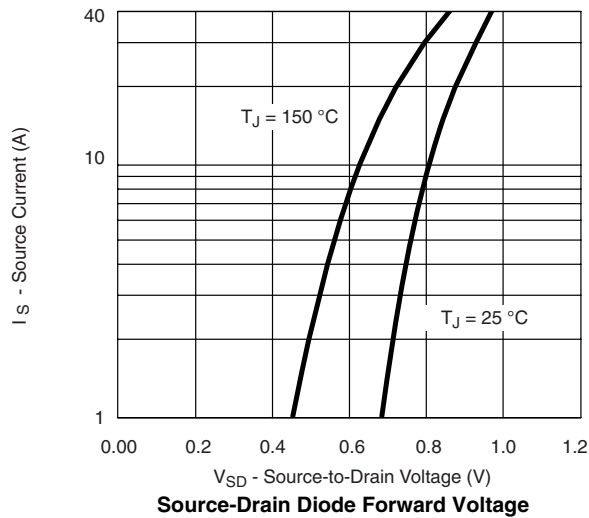
b. Guaranteed by design, not subject to production testing.

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**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current and Gate Voltage****Capacitance****Gate Charge****On-Resistance vs. Junction Temperature**

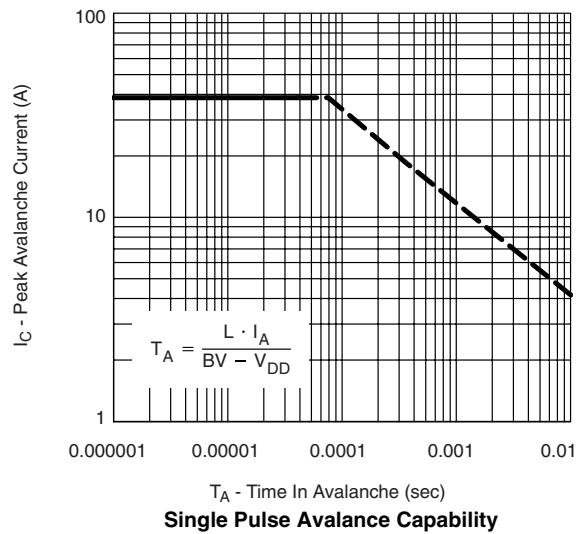
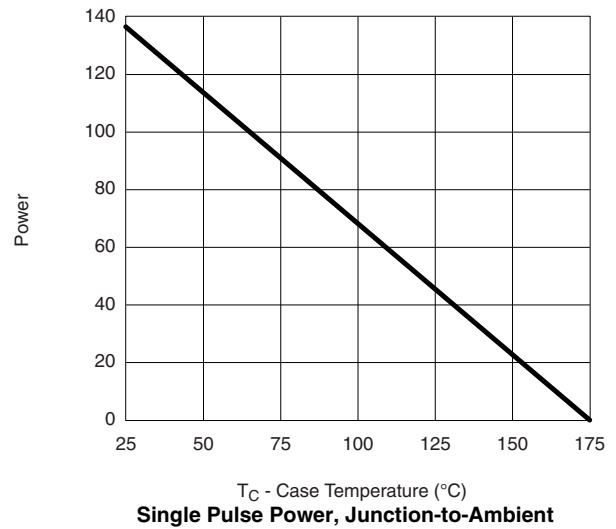
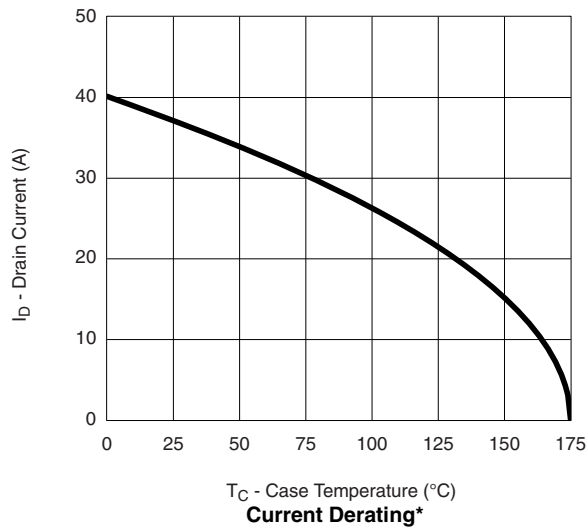
SUD50P10-43L

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



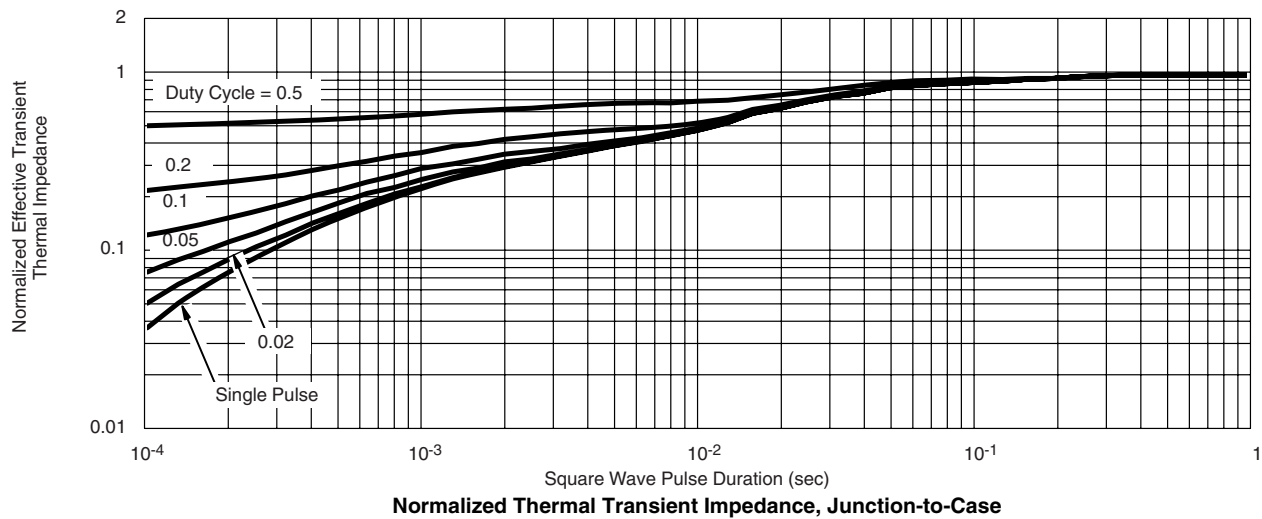
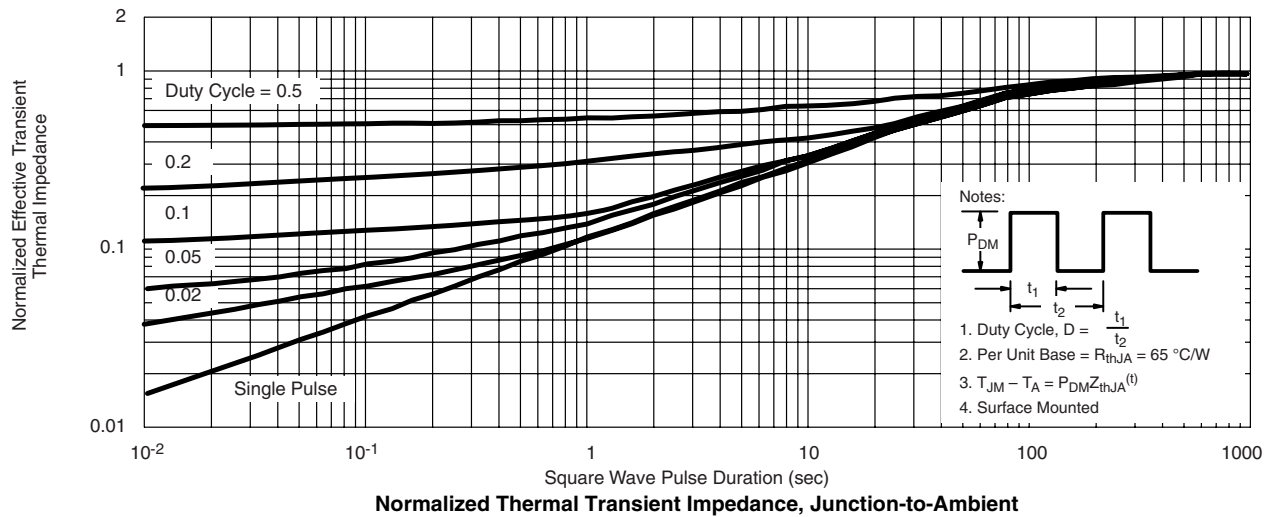
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



*The power dissipation P_D is based on $T_{J(max)} = 175$ °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.

SUD50P10-43L

Vishay Siliconix

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

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