

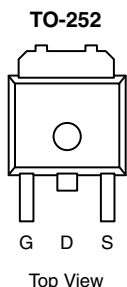
P-Channel 80-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY

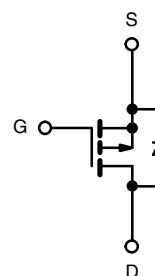
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ)
- 80	0.026 at $V_{GS} = - 10$ V	- 50	102 nC

FEATURES

- TrenchFET[®] Power MOSFET


RoHS
COMPLIANT


Ordering Information: SUD50P08-26-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}	- 80	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	$T_C = 25$ °C	- 50 ^a	A
	$T_C = 70$ °C	- 43.6 ^a	
	$T_A = 25$ °C	- 12.9 ^{b, c}	
	$T_A = 70$ °C	- 10.8 ^{b, c}	
Pulsed Drain Current	I_{DM}	- 60	
Continuous Source-Drain Diode Current	$T_C = 25$ °C	- 50 ^a	
	$T_A = 25$ °C	- 6.9 ^{b, c}	
Avalanche Current	$L = 0.1$ mH	- 45	
Single-Pulse Avalanche Energy	E_{AS}	101	mJ
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
Maximum Junction-to-Ambient ^{b, d}	$t \leq 10$ sec	R_{thJA}	15	18
Maximum Junction-to-Case (Drain)	Steady State	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.

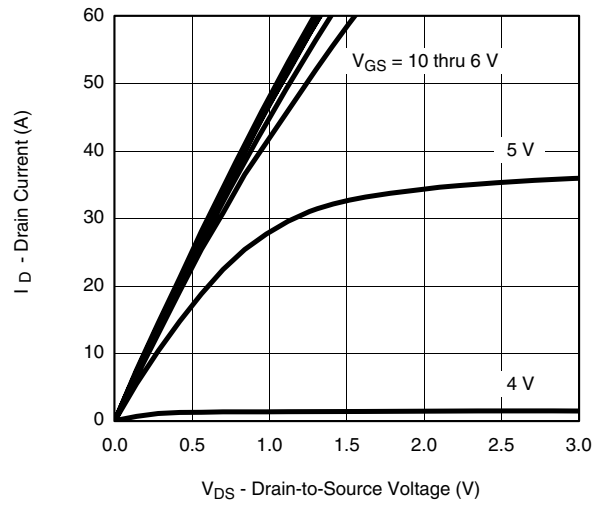
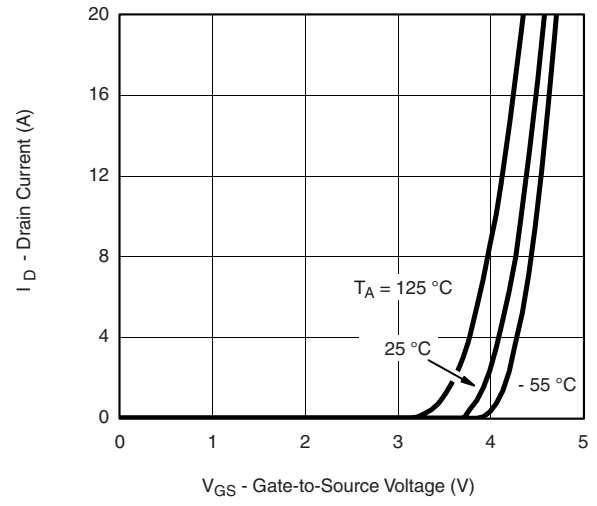
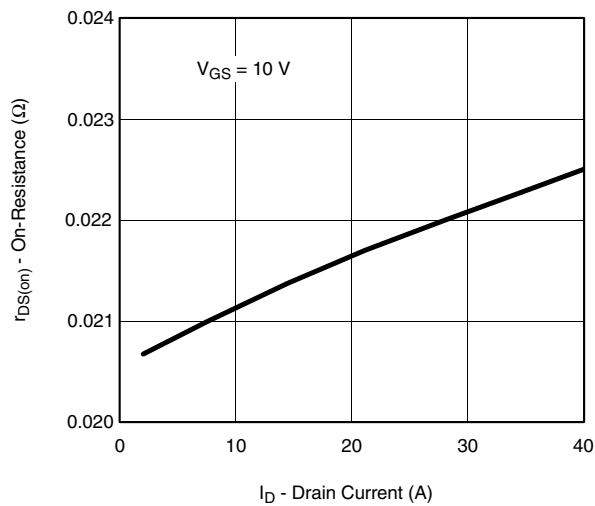
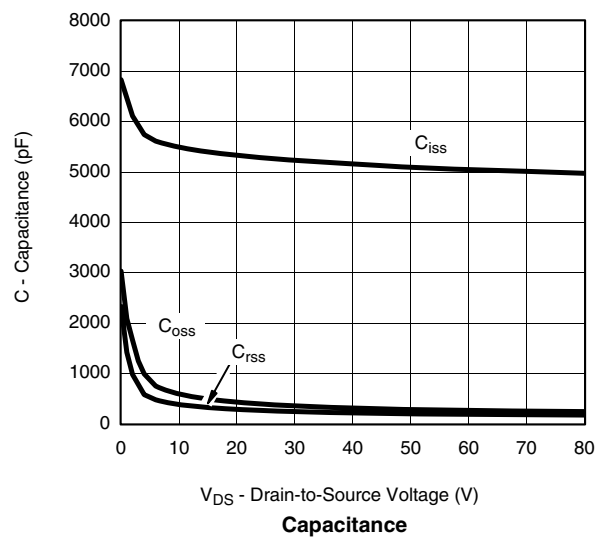
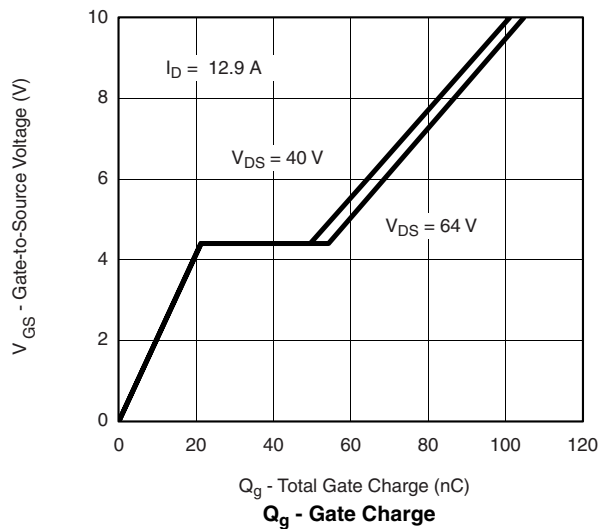
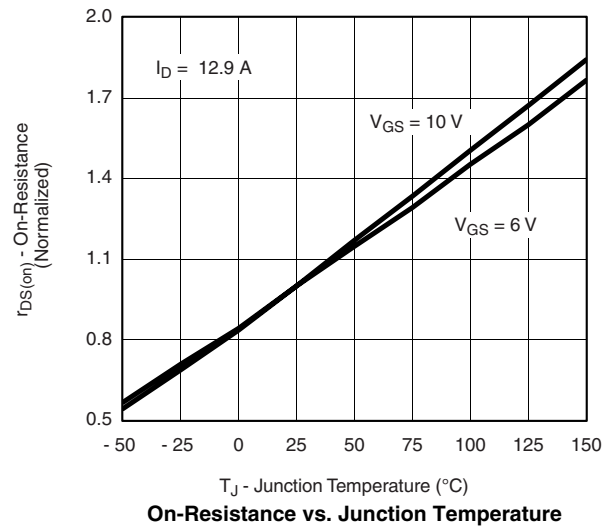
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}$, $I_D = -250\text{ }\mu\text{A}$	- 80			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		- 80		mV/ $^{\circ}\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			7.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = -250\text{ }\mu\text{A}$	- 2	- 3	- 4	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -80\text{ V}$, $V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -80\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			- 10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = -10\text{ V}$				A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}$, $I_D = -12.9\text{ A}$		0.022	0.026	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}$, $I_D = -12.9\text{ A}$		39		S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{DS} = -40\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		5160		pF
Output Capacitance	C_{oss}			320		
Reverse Transfer Capacitance	C_{rss}			220		
Total Gate Charge	Q_g	$V_{DS} = -40\text{ V}$, $V_{GS} = -10\text{ V}$, $I_D = -12.9\text{ A}$		102	155	nC
Gate-Source Charge	Q_{gs}			22		
Gate-Drain Charge	Q_{gd}			29		
Gate Resistance	R_g	$f = 1\text{ MHz}$		4		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -40\text{ V}$, $R_L = 3.7\text{ }\Omega$ $I_D \cong -10.8\text{ A}$, $V_{GEN} = -10\text{ V}$, $R_g = 1\text{ }\Omega$		15	25	ns
Rise Time	t_r			50	75	
Turn-Off Delay Time	$t_{d(off)}$			90	135	
Fall Time	t_f			65	100	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^{\circ}\text{C}$			- 50	A
Pulse Diode Forward Current ^a	I_{SM}				- 60	
Body Diode Voltage	V_{SD}	$I_S = -10.8\text{ A}$		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10.8\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25\text{ }^{\circ}\text{C}$		60	90	ns
Body Diode Reverse Recovery Charge	Q_{rr}			150	235	nC
Reverse Recovery Fall Time	t_a			45		ns
Reverse Recovery Rise Time	t_b			15		

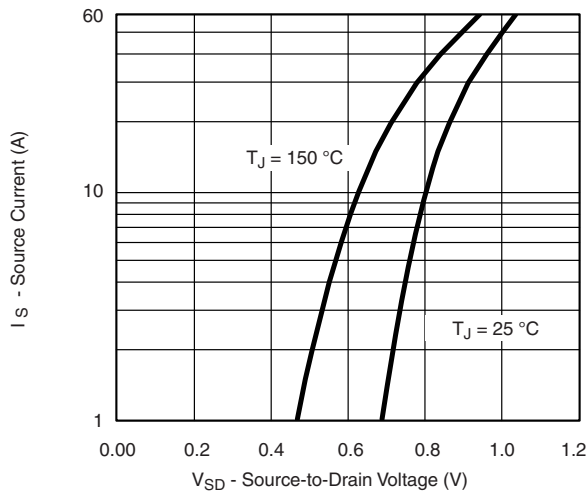
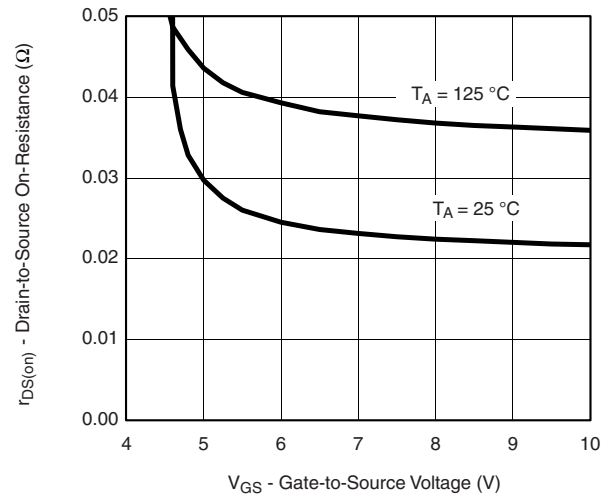
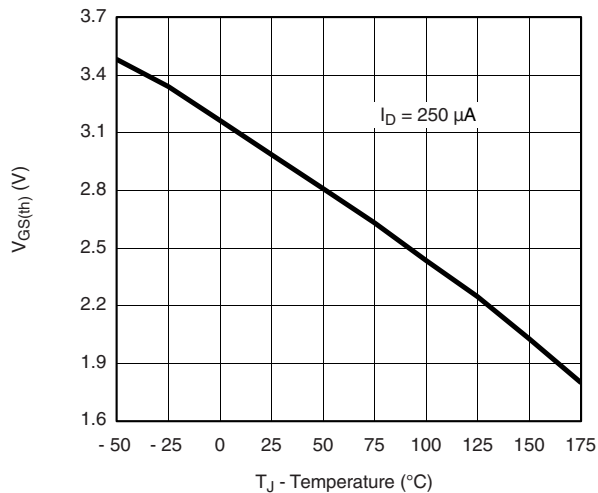
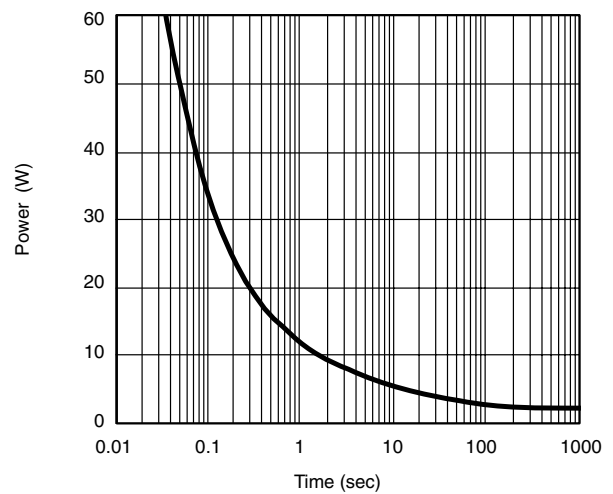
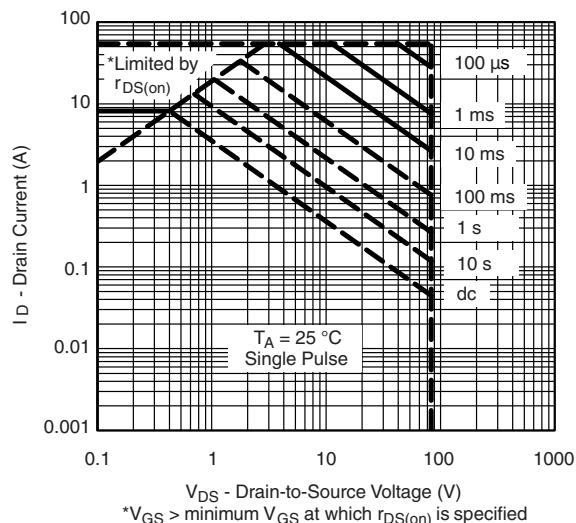
Notes:

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

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

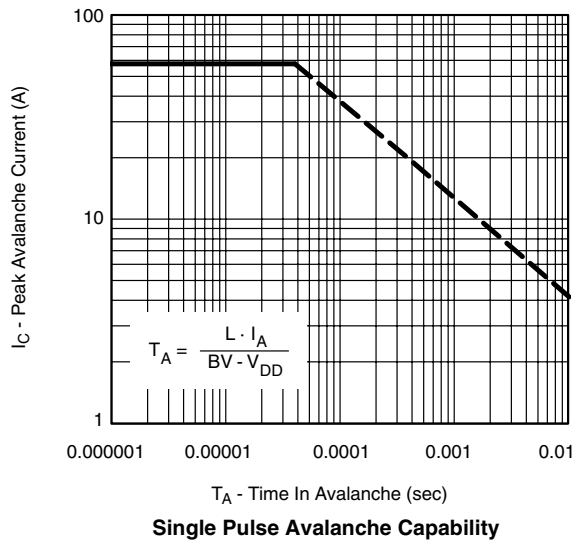
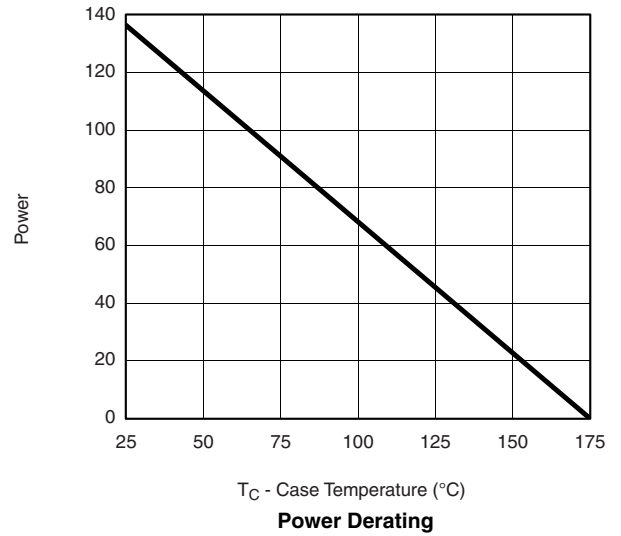
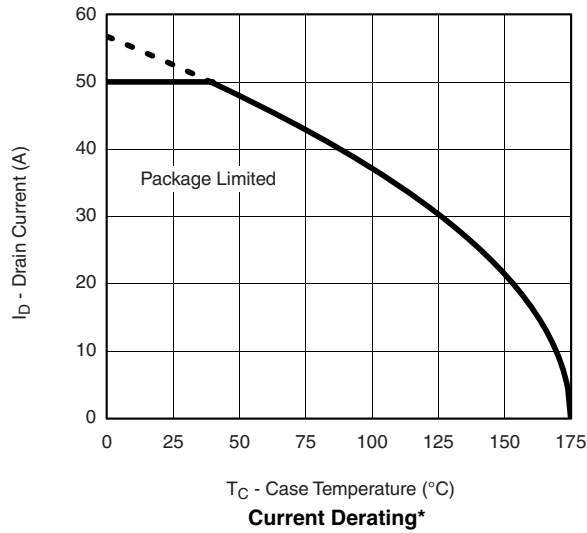
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

**TYPICAL CHARACTERISTICS** 25 °C unless noted**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Capacitance****Qg - Gate Charge****On-Resistance vs. Junction Temperature**

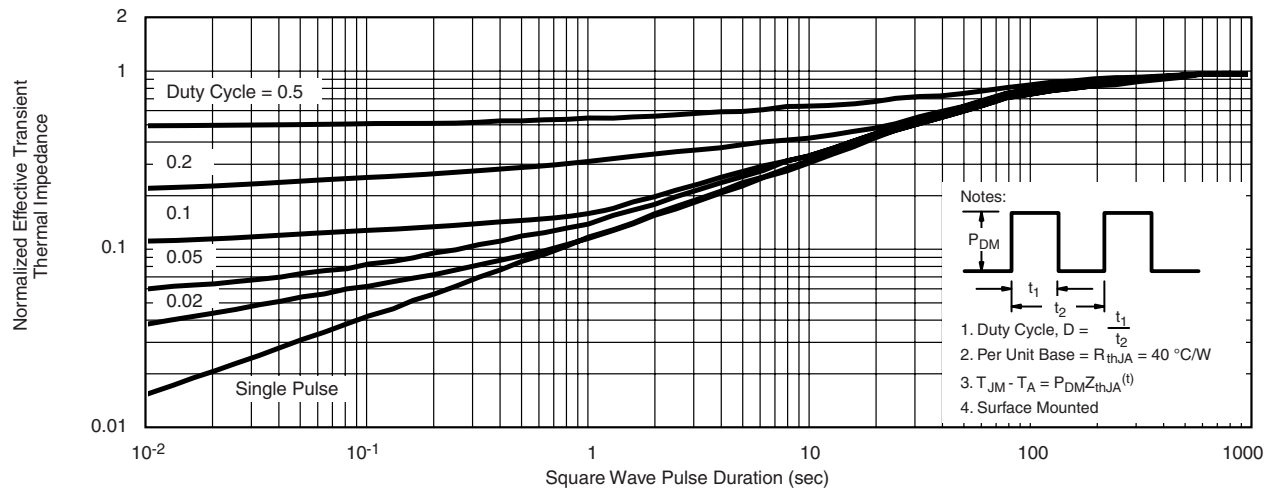
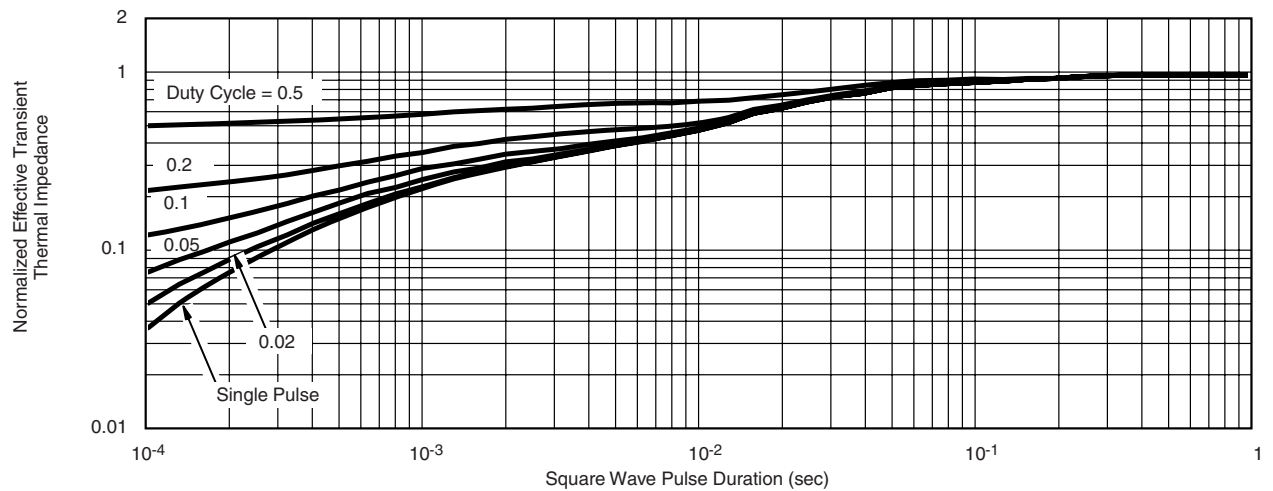
TYPICAL CHARACTERISTICS 25 °C unless noted**Source-Drain Diode Forward Voltage****On-Resistance vs. Gate-to-Source Voltage****Threshold Voltage****Single Pulse Power, Junction-to-Ambient****Safe Operating Area, Junction-to-Ambient**



TYPICAL CHARACTERISTICS 25 °C unless 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.

**TYPICAL CHARACTERISTICS** 25 °C unless noted**Normalized Thermal Transient Impedance, Junction-to-Ambient****Normalized Thermal Transient Impedance, Junction-to-Case**

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