

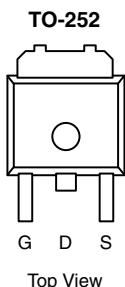
P-Channel 100-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ)
- 100	0.017 at $V_{GS} = - 10$ V	- 50	55 nC
	0.021 at $V_{GS} = - 4.5$ V	- 47	

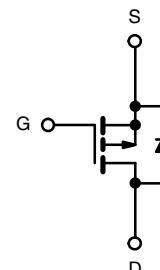
FEATURES

- Trench Power MOSFET



Drain Connected to Tab

Top View



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)	I_D	- 50 ^a	A
		- 42.5 ^a	
		- 12.5 ^{b, c}	
		- 10.5 ^{b, c}	
Pulsed Drain Current	I_{DM}	- 40	
Continuous Source-Drain Diode Current	I_S	- 50 ^a	
		- 6.9 ^{b, c}	
Avalanche Current	I_{AS}	- 45	
Single-Pulse Avalanche Energy	E_{AS}	101	mJ
Maximum Power Dissipation	P_D	136	W
		95	
		8.3 ^{b, 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}	R_{thJA}	15	18	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	0.85	
Notes:			1.1	

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.

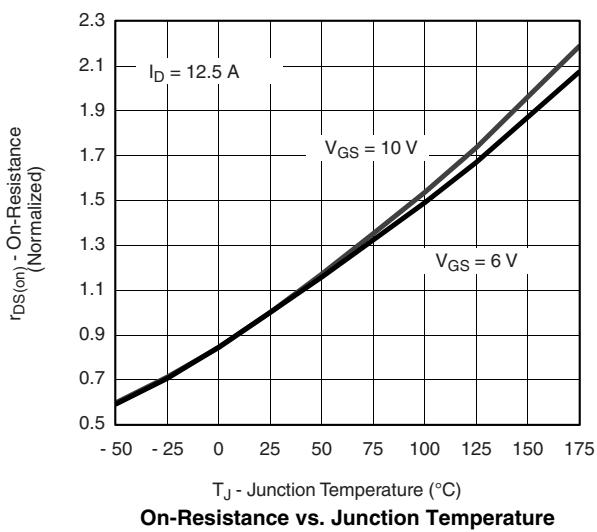
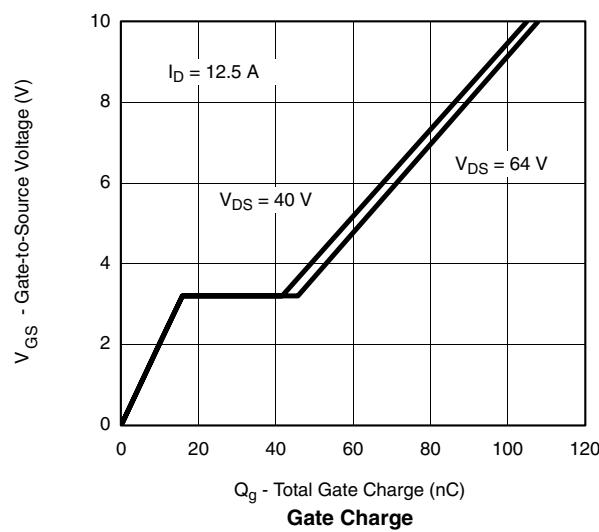
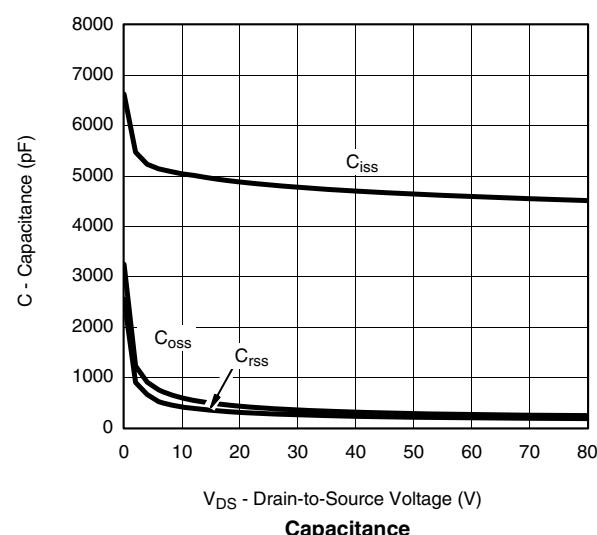
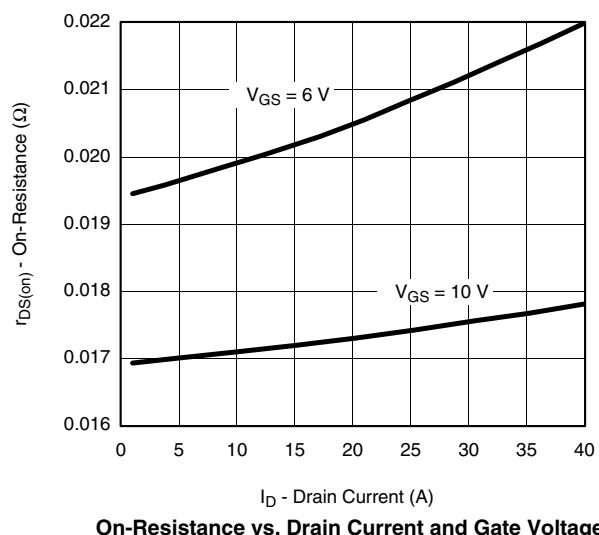
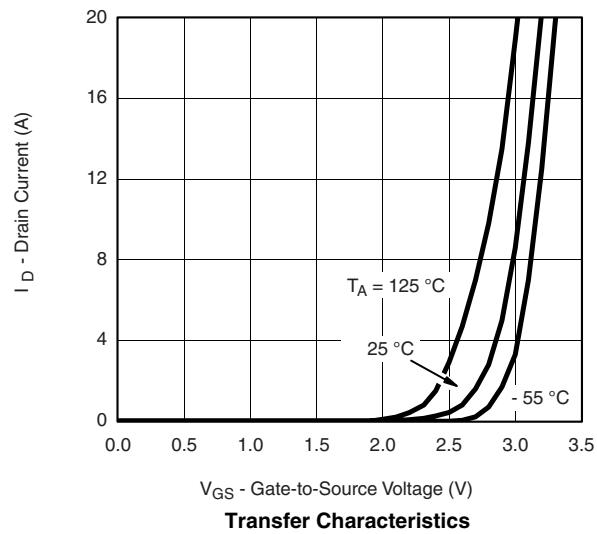
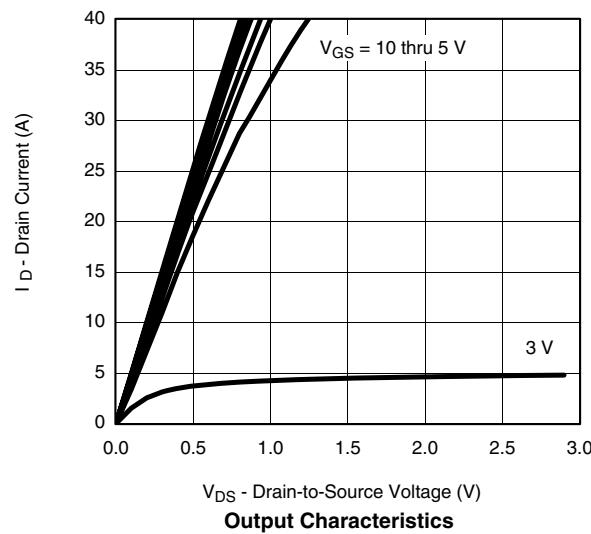
SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

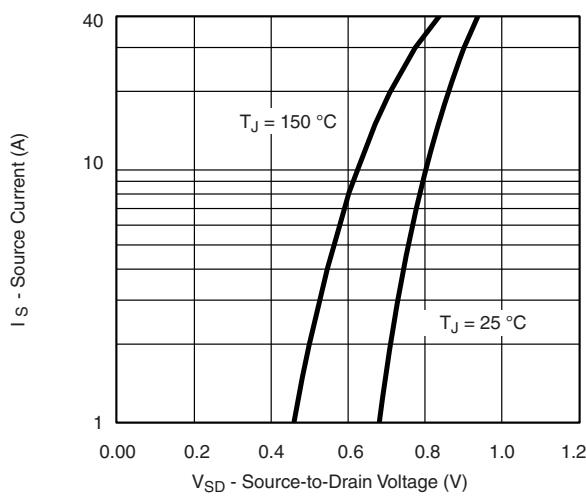
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}$, $I_D = -250 \mu\text{A}$	-100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250 \mu\text{A}$		-73		$\text{mV/}^\circ\text{C}$
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			-5.5		
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$	-1		-3	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}	$V_{DS} = -100 \text{ V}$, $V_{GS} = 0 \text{ V}$			-1	μA
		$V_{DS} = -100 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 55^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq 5 \text{ V}$, $V_{GS} = -10 \text{ V}$				A
Drain-Source On-State Resistance ^a	$r_{DS(\text{on})}$	$V_{GS} = -10 \text{ V}$, $I_D = -12.5 \text{ A}$		0.017		Ω
		$V_{GS} = -4.5 \text{ V}$, $I_D = -10.5 \text{ A}$		0.021		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15 \text{ V}$, $I_D = -12.5 \text{ A}$		52		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -50 \text{ V}$, $V_{GS} = 0 \text{ V}$, $f = 1 \text{ MHz}$		4700		pF
Output Capacitance	C_{oss}			320		
Reverse Transfer Capacitance	C_{rss}			235		
Total Gate Charge	Q_g	$V_{DS} = -50 \text{ V}$, $V_{GS} = -10 \text{ V}$, $I_D = -12.5 \text{ A}$		105	160	nC
Gate-Source Charge	Q_{gs}			55	85	
Gate-Drain Charge	Q_{gd}			16		
Gate Resistance	R_g		$f = 1 \text{ MHz}$	26		
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -50 \text{ V}$, $R_L = 3.8 \Omega$ $I_D \equiv -10.5 \text{ A}$, $V_{GEN} = -10 \text{ V}$, $R_g = 1 \Omega$		4		Ω
Rise Time	t_r			45	70	ns
Turn-Off Delay Time	$t_{d(\text{off})}$			220	330	
Fall Time	t_f			95	145	
Turn-On Delay Time	$t_{d(\text{on})}$			110	165	ns
Rise Time	t_r	$V_{DD} = -40 \text{ V}$, $R_L = 3.8 \Omega$ $I_D \equiv -10.5 \text{ A}$, $V_{GEN} = -4.5 \text{ V}$, $R_g = 1 \Omega$		15	25	
Turn-Off Delay Time	$t_{d(\text{off})}$			25	40	
Fall Time	t_f			105	160	
				100	150	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			-50	A
Pulse Diode Forward Current ^a	I_{SM}				-40	
Body Diode Voltage	V_{SD}	$I_S = -10.5 \text{ A}$		-0.8	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10.5 \text{ A}$, $di/dt = 100 \text{ A}/\mu\text{s}$, $T_J = 25^\circ\text{C}$		55	85	ns
Body Diode Reverse Recovery Charge	Q_{rr}			110	165	nC
Reverse Recovery Fall Time	t_a			37		ns
Reverse Recovery Rise Time	t_b			18		

Notes:

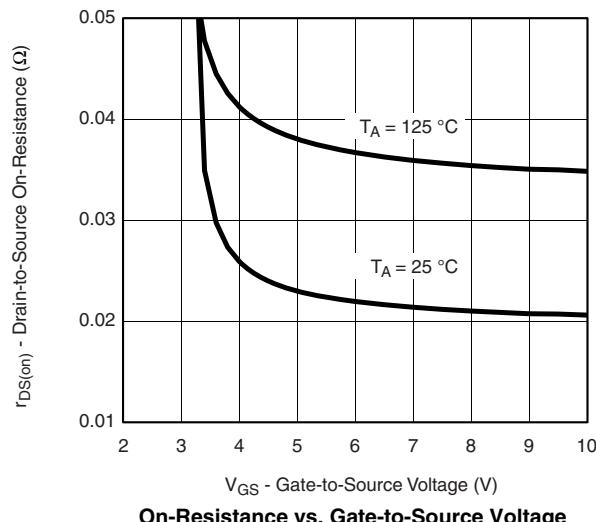
a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.
 b. Guaranteed by design, not subject to production testing.

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.

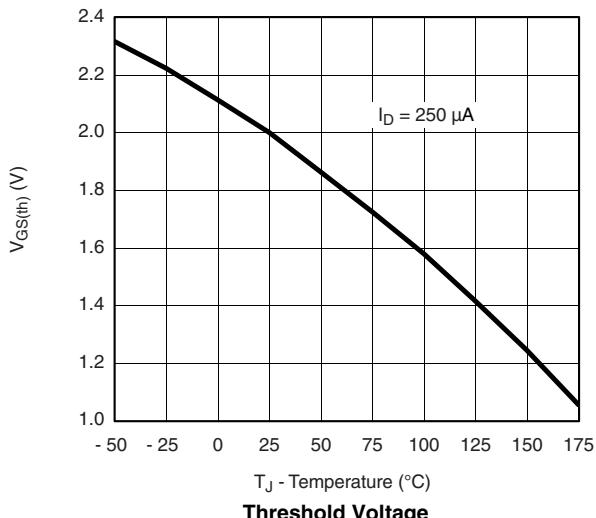
TYPICAL CHARACTERISTICS 25 °C unless noted


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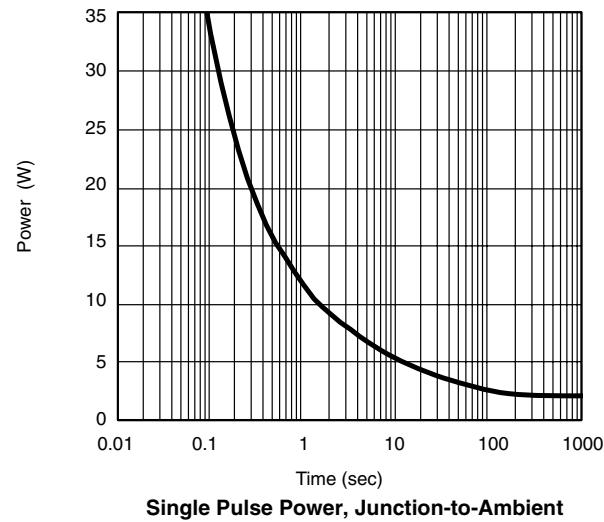
Source-Drain Diode Forward Voltage



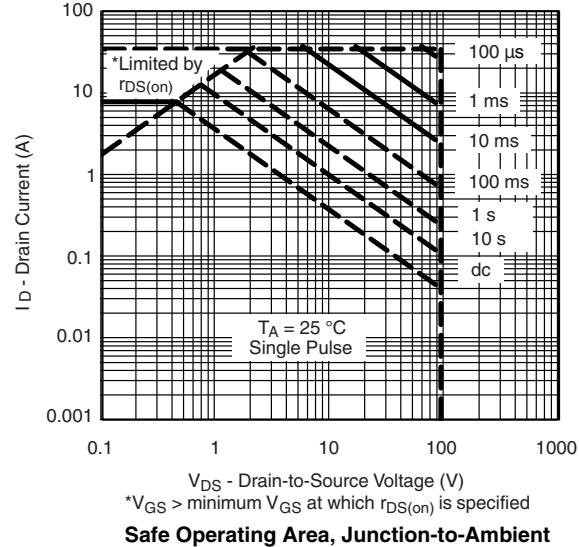
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

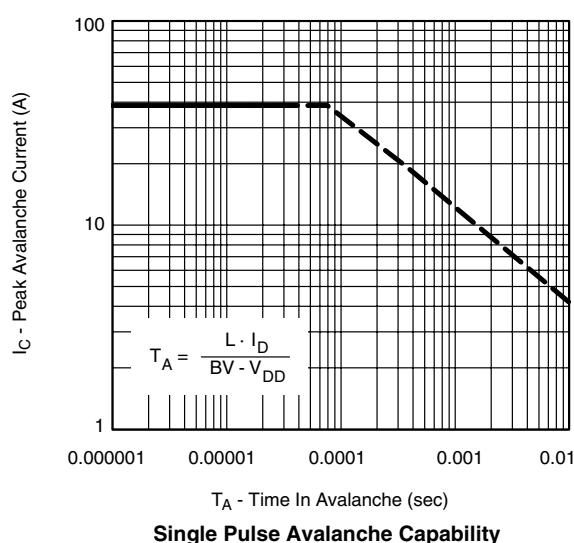
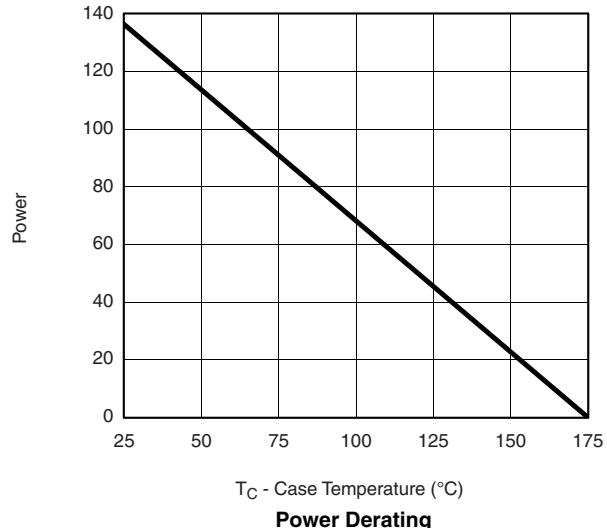
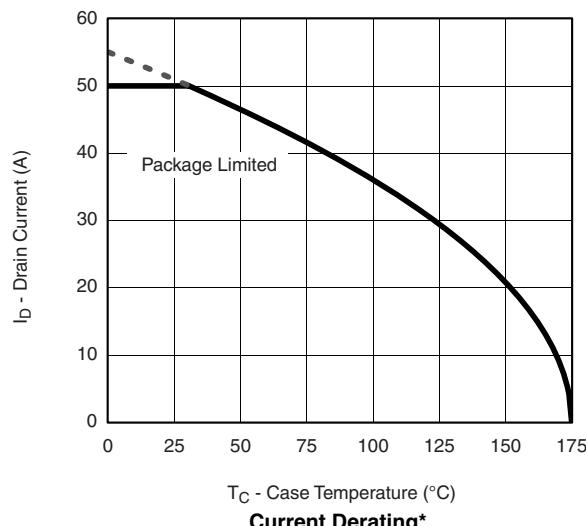


Single Pulse Power, Junction-to-Ambient

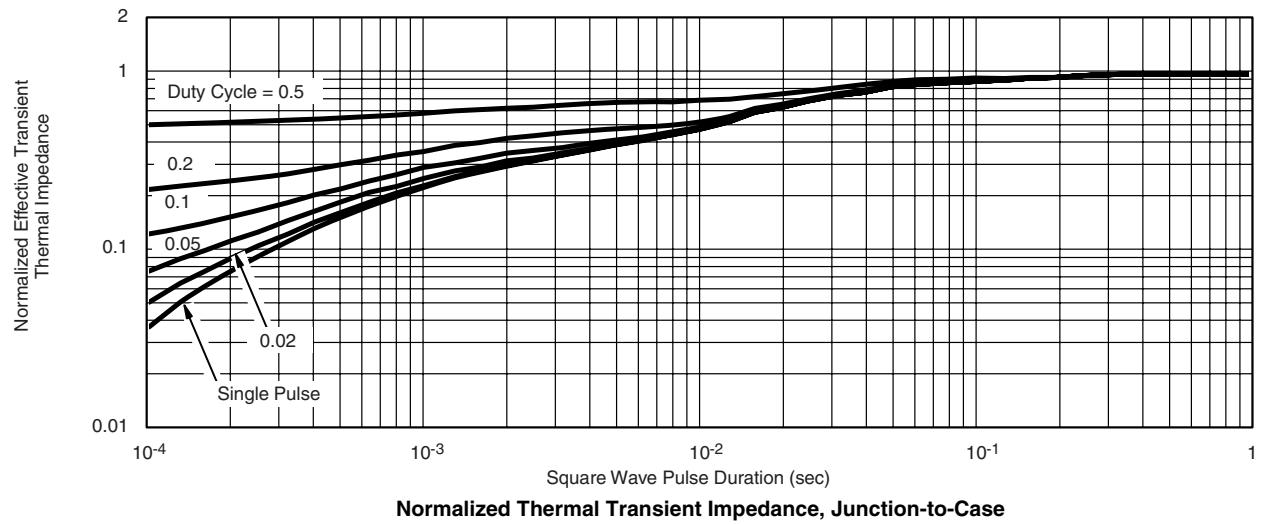
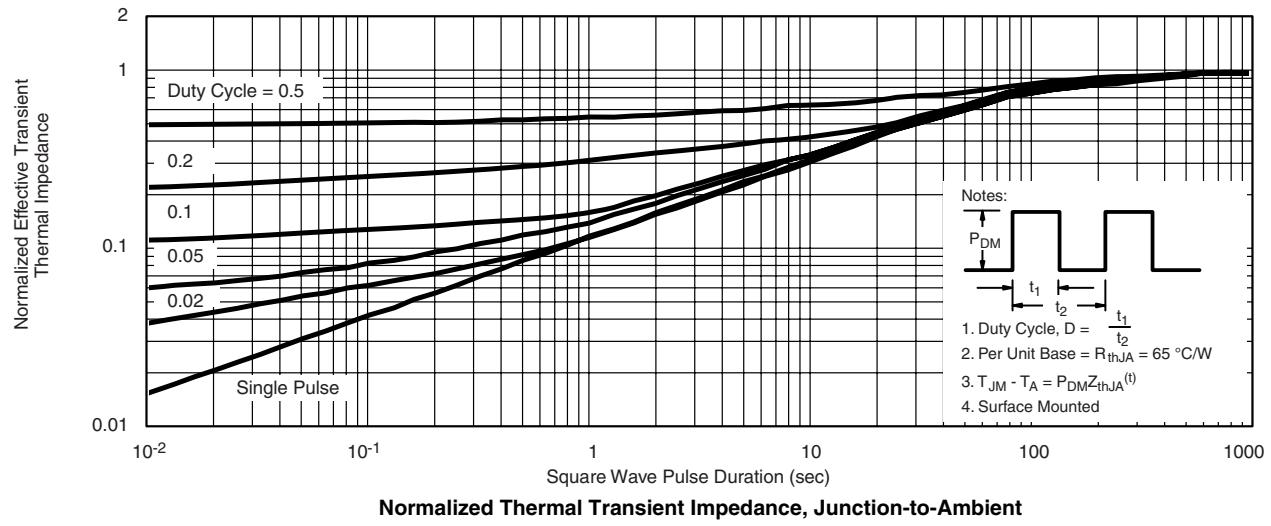


* $V_{GS} > \text{minimum } V_{GS}$ at which $r_{DS(on)}$ is specified

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


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