

P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^{a, e}	Q_g (Typ.)
- 30	0.060 at $V_{GS} = - 10$ V	- 5.0	7 nC
	0.075 at $V_{GS} = - 4.5$ V	- 4.6	

FEATURES

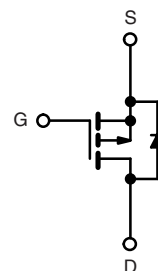
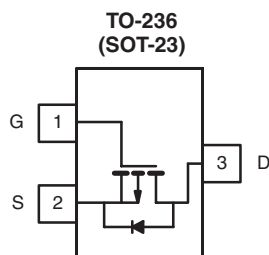
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET
- 100 % R_g Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Load Switch
- Notebook Adaptor Switch
- DC/DC Converter



P-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 30	V
Gate-Source Voltage	V_{GS}	± 20	
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	$T_C = 25$ °C	
		$T_A = 25$ °C	W
Maximum Power Dissipation	P_D	$T_C = 25$ °C	
		$T_C = 70$ °C	
		$T_A = 25$ °C	
		$T_A = 70$ °C	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	75	100	°C/W
Maximum Junction-to-Foot (Drain)	R_{thJF}	40	50	

Notes:

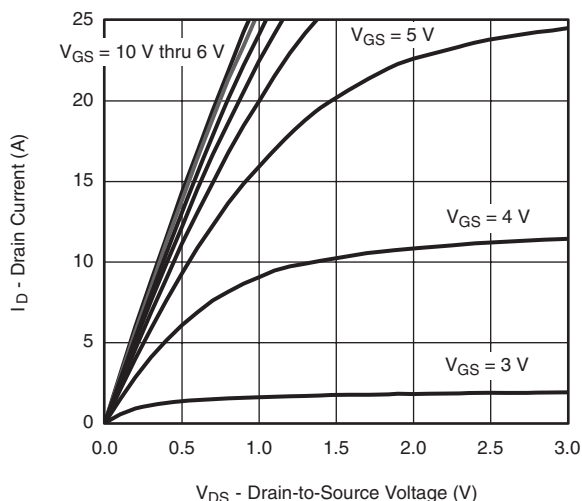
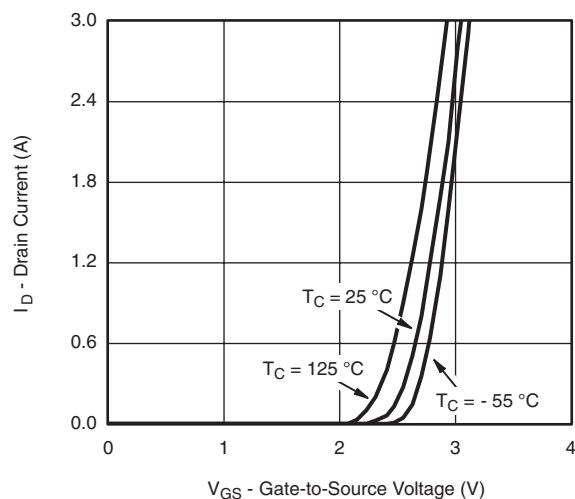
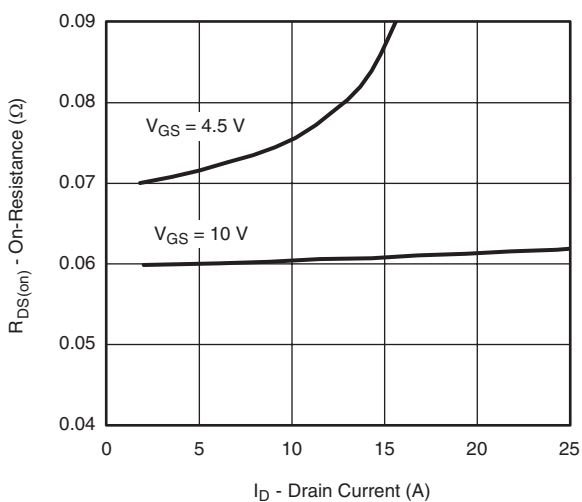
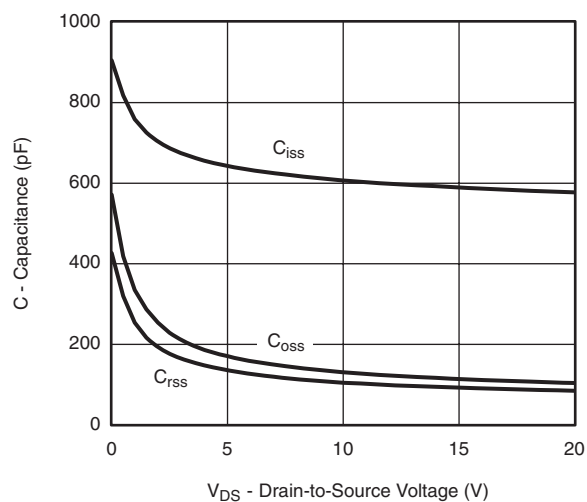
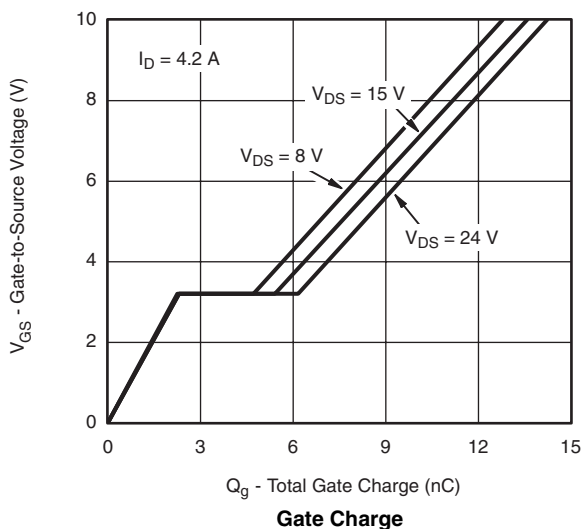
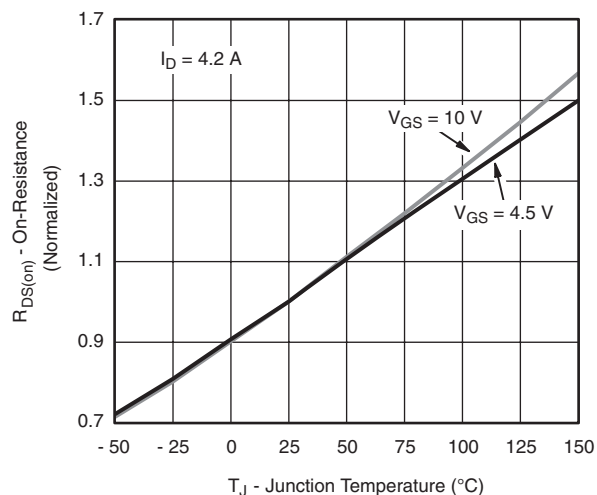
- Based on $T_C = 25$ °C.
- Surface Mounted on 1" x 1" FR4 board.
- $t = 5$ s.
- Maximum under Steady State conditions is 166 °C/W.
- Package Limited.

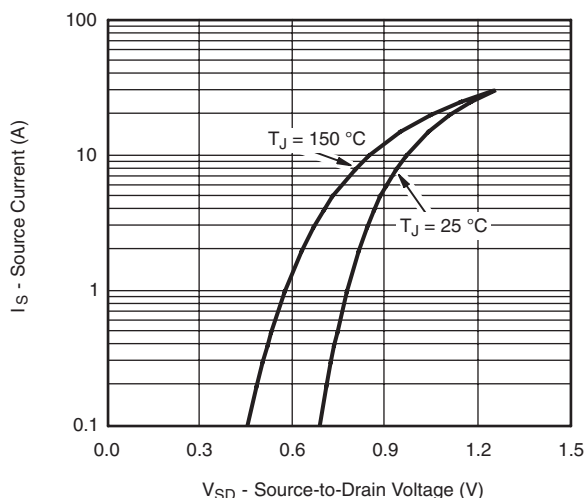
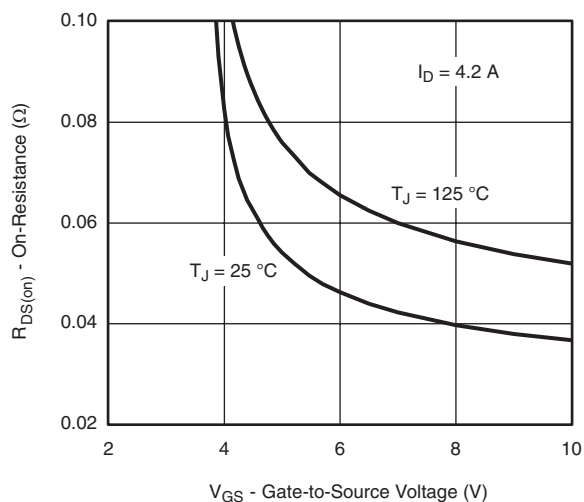
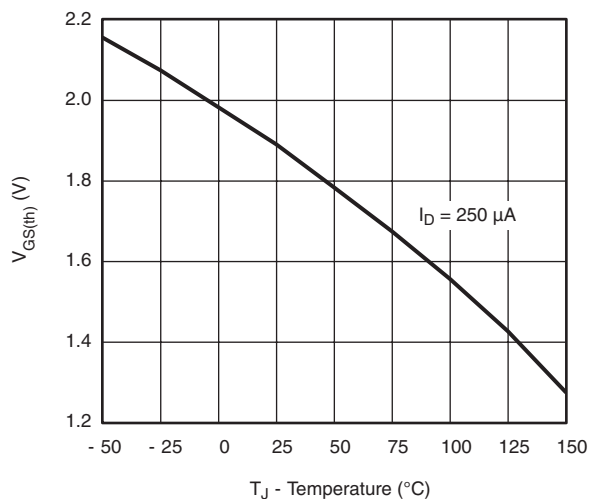
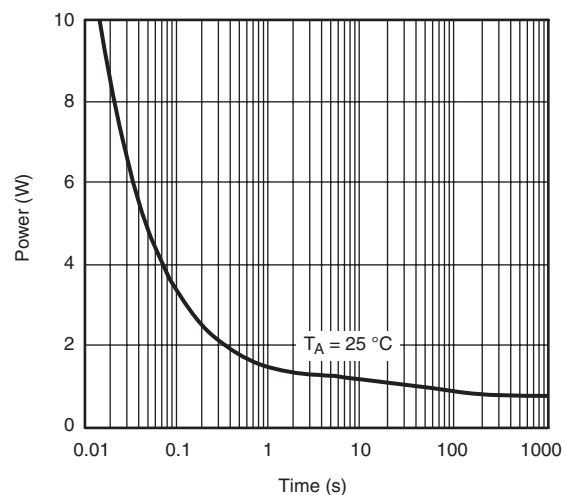
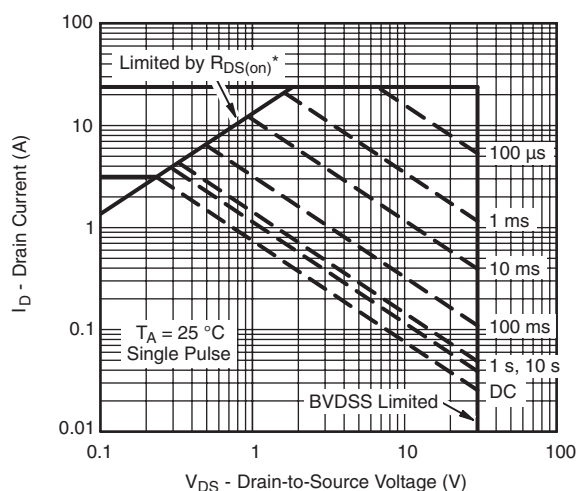
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		-19		mV/ $^{\circ}\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			4.4		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.0		-2.5	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}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^{\circ}\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	-25			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -4.2\text{ A}$		0.060		Ω
		$V_{GS} = -4.5\text{ V}, I_D = -3.2\text{ A}$		0.075		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -4.2\text{ A}$		10		S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		590		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			93		
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -4.2\text{ A}$		13.6	21	nC
		$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -4.2\text{ A}$		7	11	
Q_{gs}			2.3			
Q_{gd}			3.2			
Gate Resistance	R_g	$f = 1\text{ MHz}$	1	5	10	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 4.5\text{ }\Omega$ $I_D \equiv -3.3\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ }\Omega$		30	45	ns
Rise Time	t_r			25	38	
Turn-Off Delay Time	$t_{d(off)}$			16	24	
Fall Time	t_f			8	16	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 4.5\text{ }\Omega$ $I_D \equiv -3.3\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		8	16	
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			18	27	
Fall Time	t_f			8	16	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^{\circ}\text{C}$			-4.2	A
Pulse Diode Forward Current	I_{SM}				-25	
Body Diode Voltage	V_{SD}	$I_S = -3.3\text{ A}, V_{GS} = 0\text{ V}$		-0.8	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -3.3\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^{\circ}\text{C}$		17	26	ns
Body Diode Reverse Recovery Charge	Q_{rr}			9	18	nC
Reverse Recovery Fall Time	t_a			10		ns
Reverse Recovery Rise Time	t_b			7		

Notes:

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

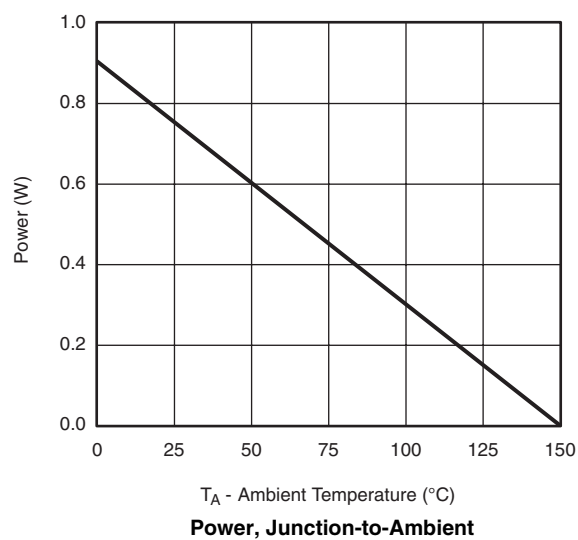
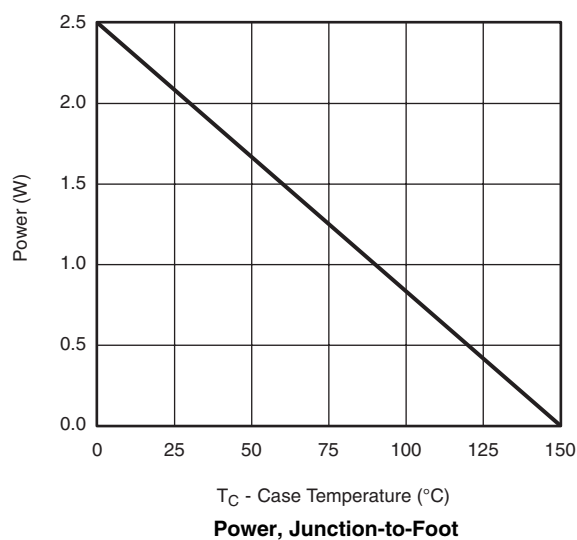
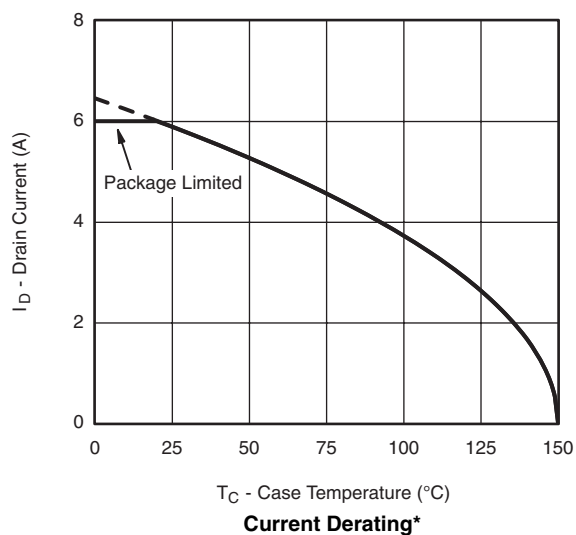
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

Source-Drain Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage

Threshold Voltage

Single Pulse Power (Junction-to-Ambient)


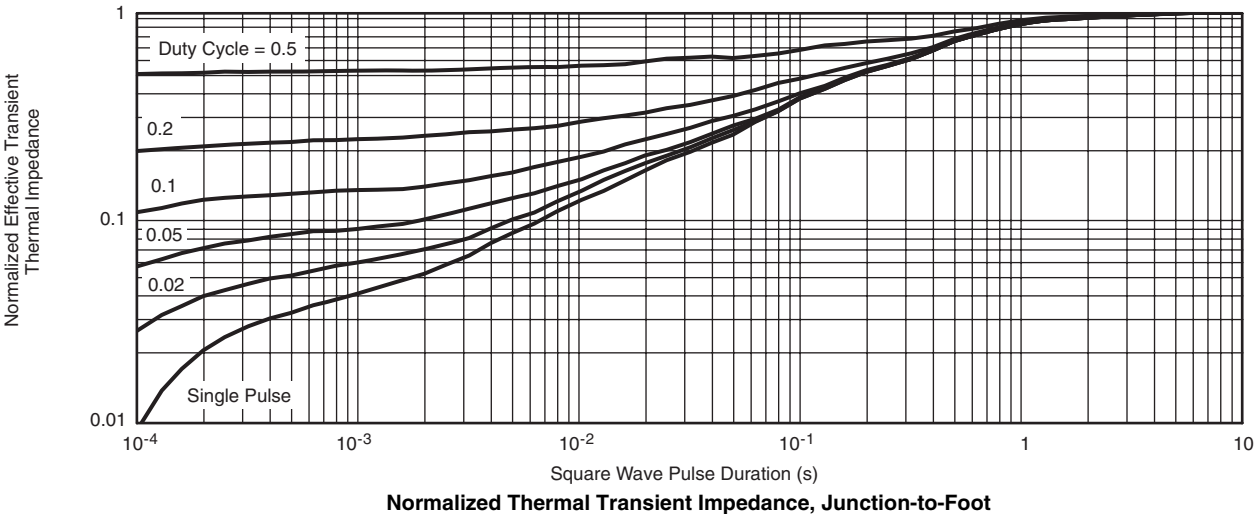
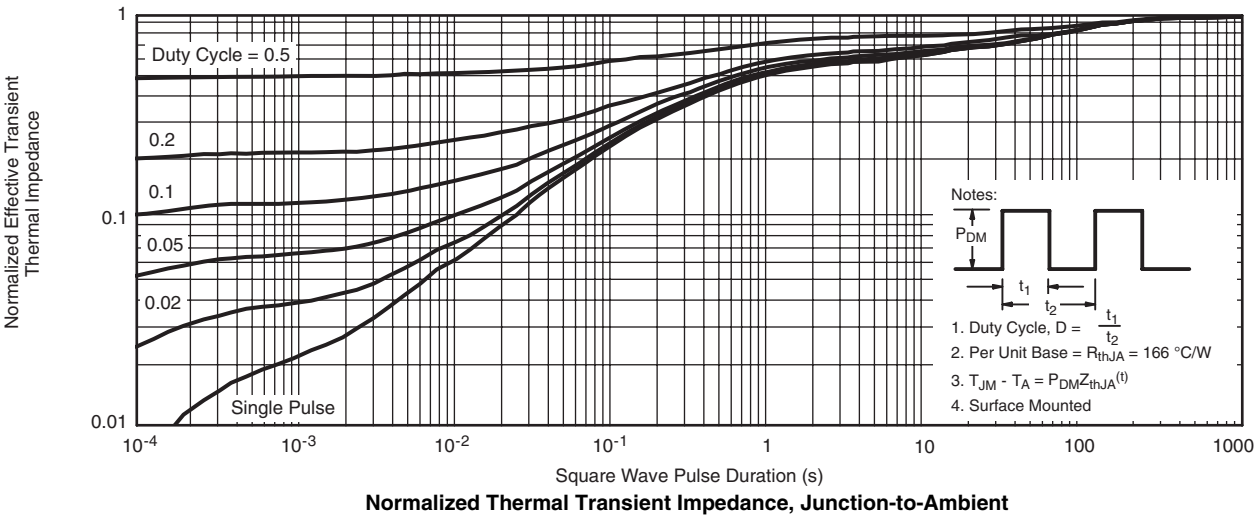
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

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.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



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