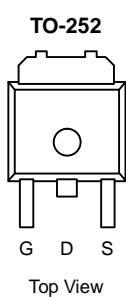


P-Channel 30-V (D-S) MOSFET

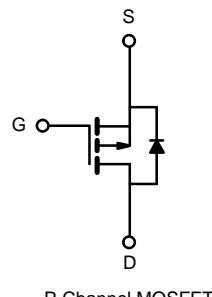
PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^d	Q _g (Typ.)
- 30	0.033 at V _{GS} = - 10 V	- 43	19 nC
	0.040 at V _{GS} = - 4.5 V	- 30	

FEATURES

- Halogen-free
- TrenchFET® Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested


RoHS
 COMPLIANT


Top View



APPLICATIONS

- Load Switch
- Notebook Adaptor Switch

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	- 43	A	
		- 30		
		- 12.9 ^{a, b}		
		- 9.6 ^{a, b}		
Pulsed Drain Current	I _{DM}	- 130	A	
Continuous Source-Drain Diode Current	I _S	- 4.1		
		- 2.2 ^{a, b}		
Avalanche Current	I _{AS}	- 20		
Single-Pulse Avalanche Energy	E _{AS}	20	mJ	
Maximum Power Dissipation	P _D	25	W	
		20		
		2.7 ^{a, b}		
		1.7 ^{a, 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 ^{a, c}	R _{thJA}	38	46	°C/W
Maximum Junction-to-Foot	R _{thJF}	20	25	

Notes:

- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under Steady State conditions is 85 °C/W.
- Based on T_C = 25 °C.

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

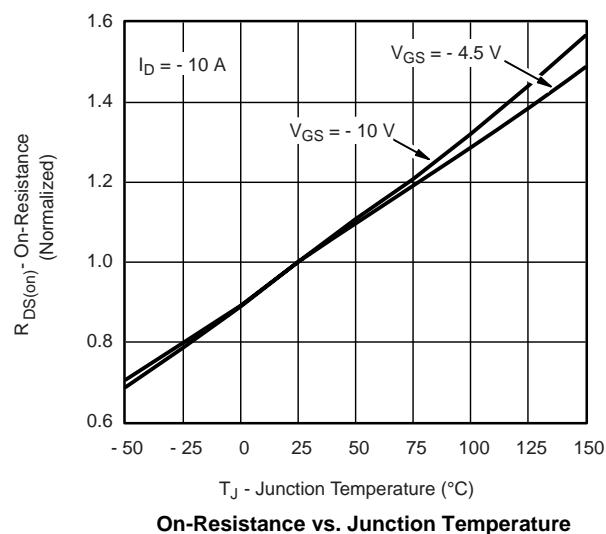
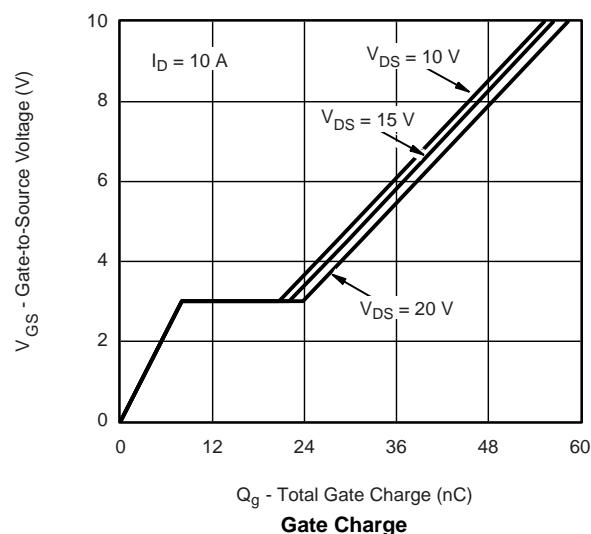
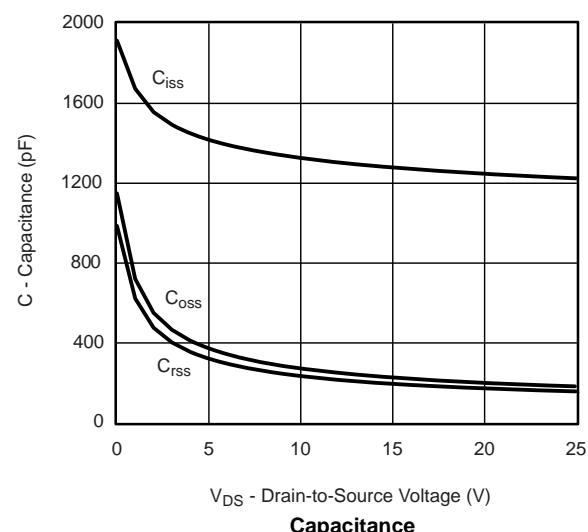
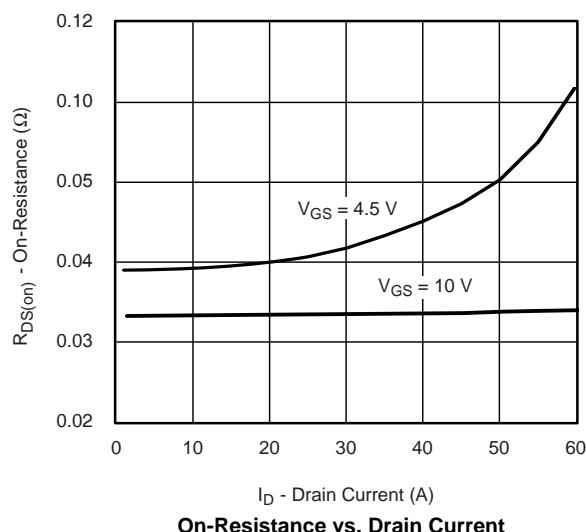
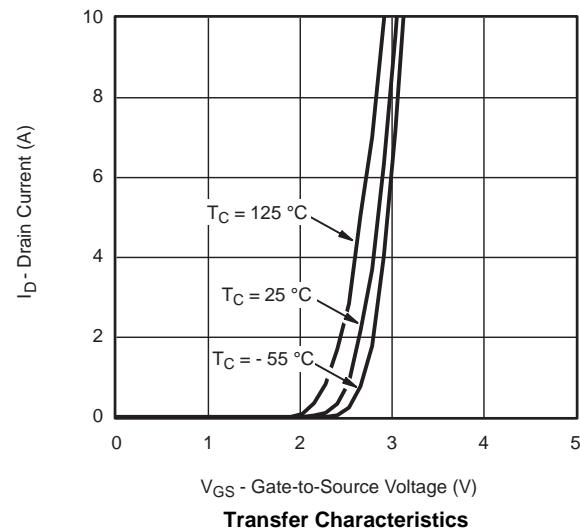
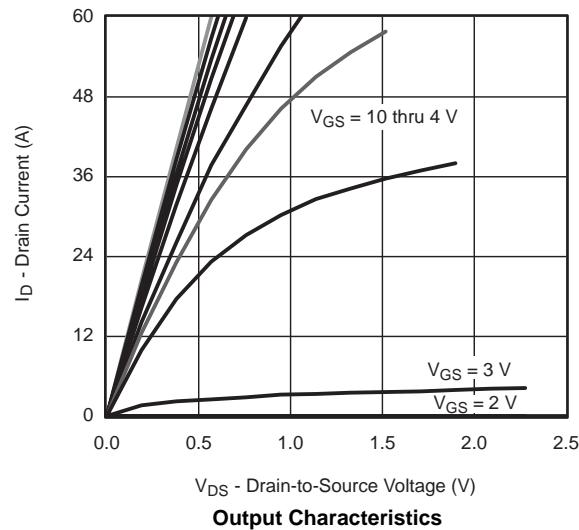
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	-30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250 \mu\text{A}$		-34		
$V_{GS(\text{th})}$ Temperature Coefficient	$\Delta V_{GS(\text{th})}/T_J$			5.3		$\text{mV}/^\circ\text{C}$
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-1.0		-2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 25 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$			-1	
		$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 55^\circ\text{C}$			-5	μA
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{DS} \geq -10 \text{ V}, V_{GS} = -10 \text{ V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -10 \text{ V}, I_D = -10 \text{ A}$		0.033		
		$V_{GS} = -4.5 \text{ V}, I_D = -8 \text{ A}$		0.040		Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10 \text{ V}, I_D = -10 \text{ A}$		28		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		1350		
Output Capacitance	C_{oss}			255		
Reverse Transfer Capacitance	C_{rss}			190		pF
Total Gate Charge	Q_g	$V_{DS} = -15 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -10 \text{ A}$			20	
Gate-Source Charge	Q_{gs}	$V_{DS} = -15 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -10 \text{ A}$			19	
Gate-Drain Charge	Q_{gd}				6	
Gate Resistance	R_g	$f = 1 \text{ MHz}$	0.5	2.2	4.4	Ω
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -15 \text{ V}, R_L = 1.5 \Omega$ $I_D \geq -10 \text{ A}, V_{GEN} = -10 \text{ V}, R_g = 1 \Omega$		13	25	
Rise Time	t_r			12	24	
Turn-Off Delay Time	$t_{d(\text{off})}$			40	70	
Fall Time	t_f			9	18	
Turn-On Delay Time	$t_{d(\text{on})}$	$V_{DD} = -15 \text{ V}, R_L = 1.5 \Omega$ $I_D \geq -10 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_g = 1 \Omega$		48	80	
Rise Time	t_r			92	160	
Turn-Off Delay Time	$t_{d(\text{off})}$			34	60	
Fall Time	t_f			19	35	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25^\circ\text{C}$			-4.1	
Pulse Diode Forward Current	I_{SM}				-60	A
Body Diode Voltage	V_{SD}	$I_S = -3 \text{ A}, V_{GS} = 0 \text{ V}$		-0.75	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10 \text{ A}, dI/dt = 100 \text{ A}/\mu\text{s}, T_J = 25^\circ\text{C}$		27	45	ns
Body Diode Reverse Recovery Charge	Q_{rr}			16	27	nC
Reverse Recovery Fall Time	t_a			12		
Reverse Recovery Rise Time	t_b			15		ns

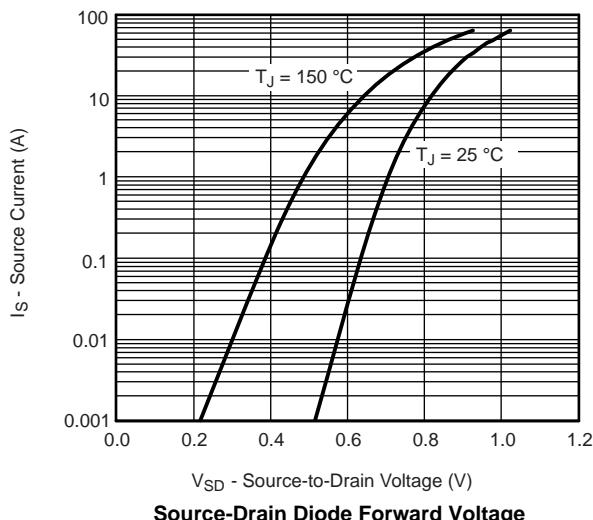
Notes:

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

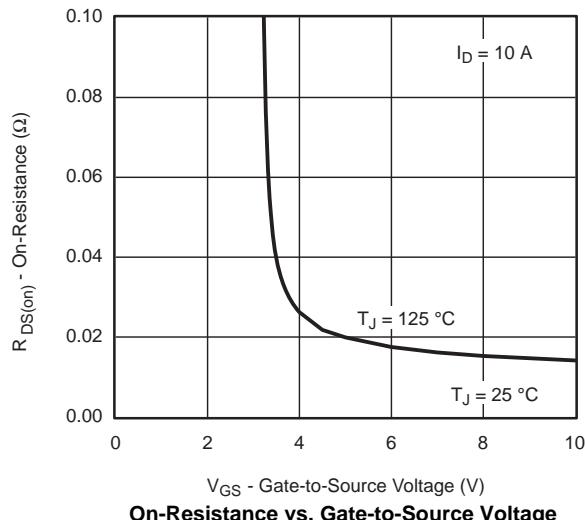
b. Guaranteed by design, not subject to production testing.

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.

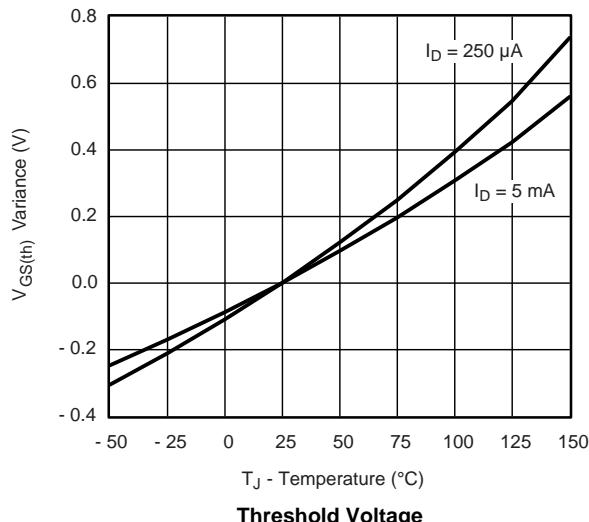
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted


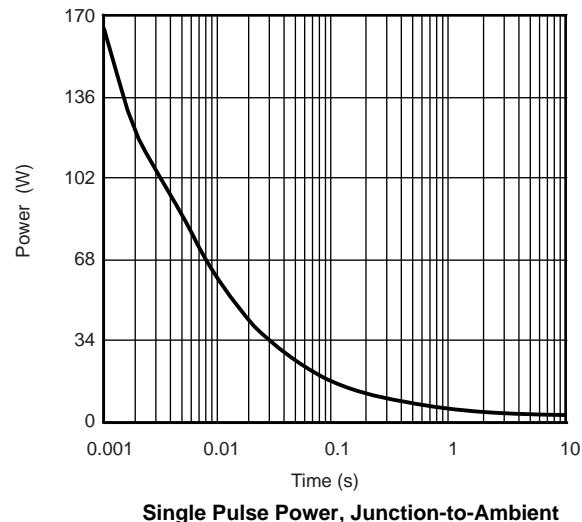
Source-Drain Diode Forward Voltage



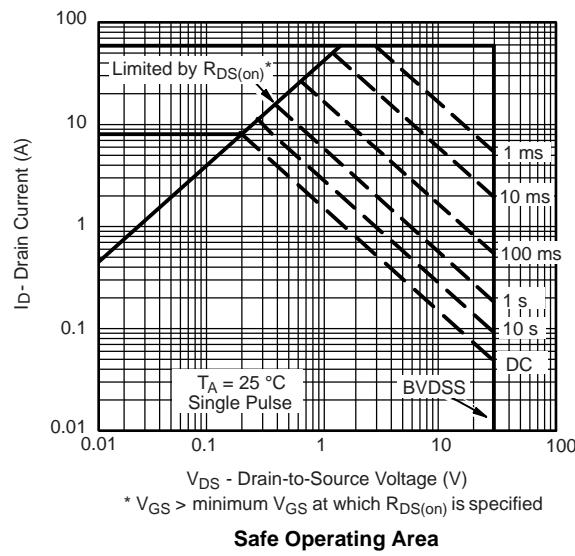
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

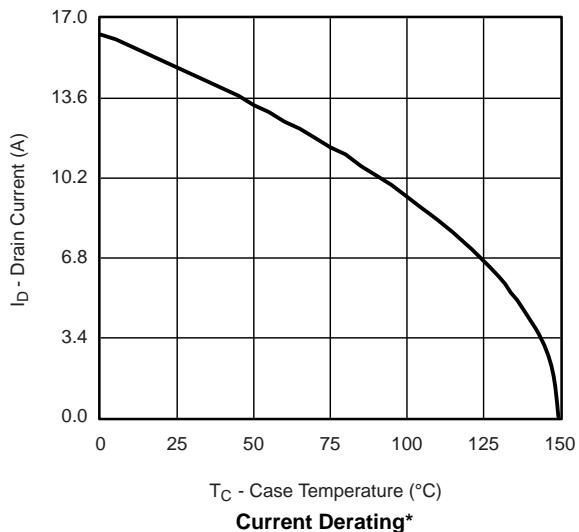


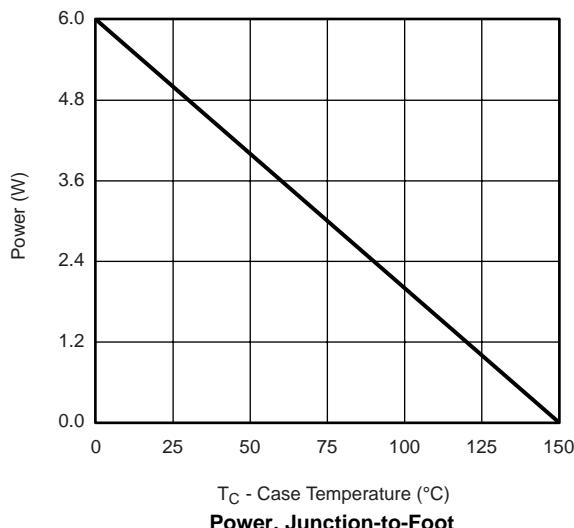
Single Pulse Power, Junction-to-Ambient

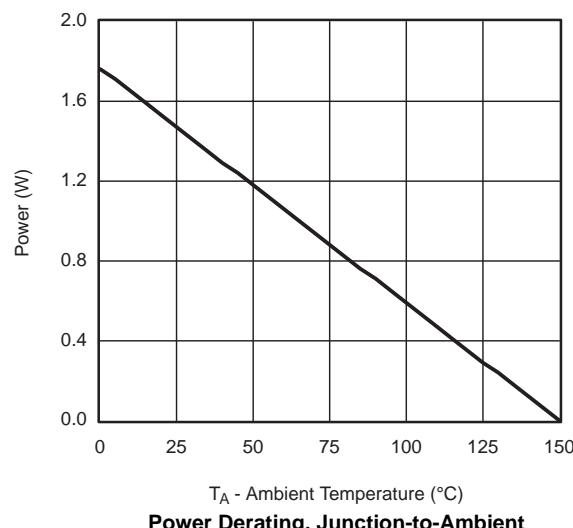


Safe Operating Area

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

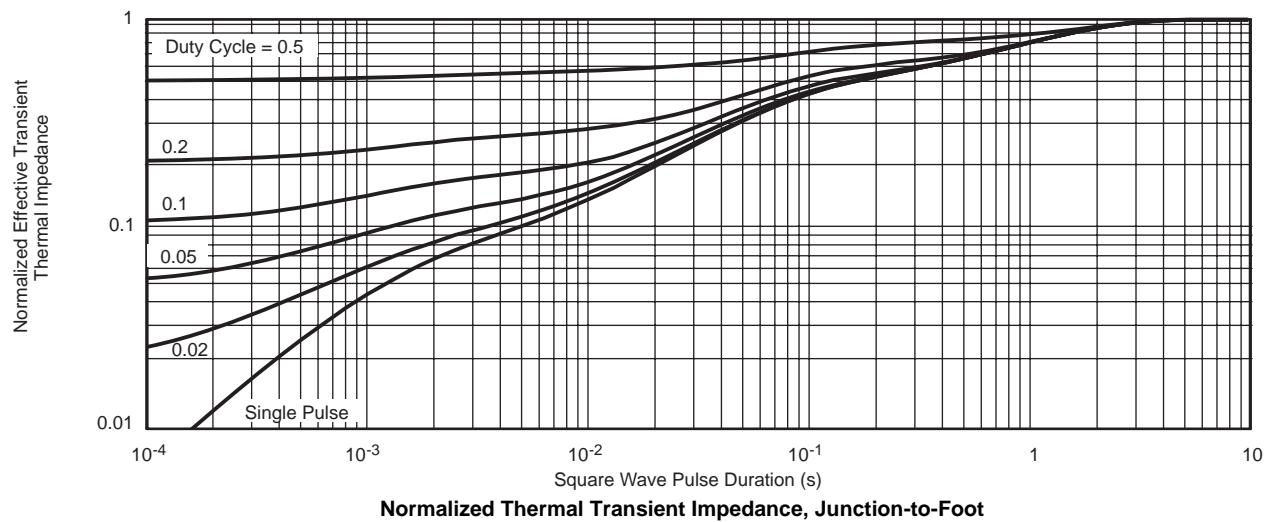
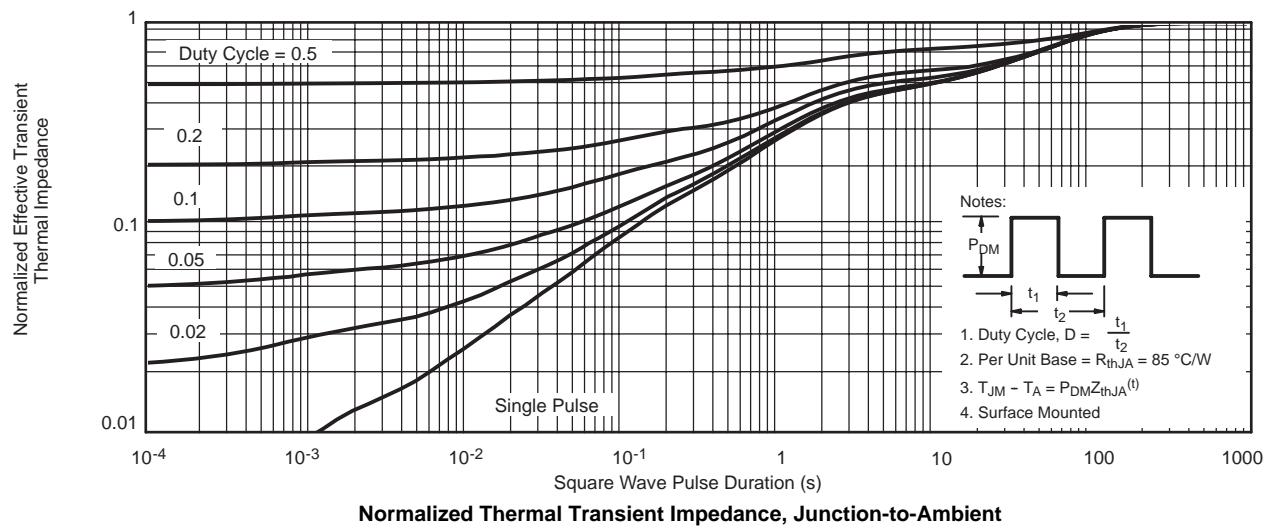
MOSFET TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

 T_C - Case Temperature (°C)

Current Derating*

 T_C - Case Temperature (°C)

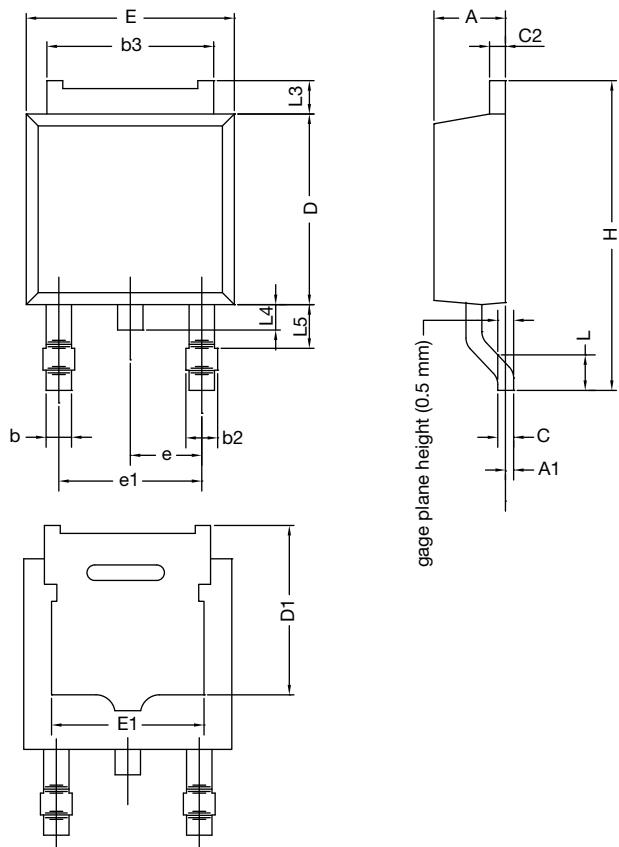
Power, Junction-to-Foot

 T_A - Ambient Temperature (°C)

Power Derating, Junction-to-Ambient

* 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


TO-252AA CASE OUTLINE

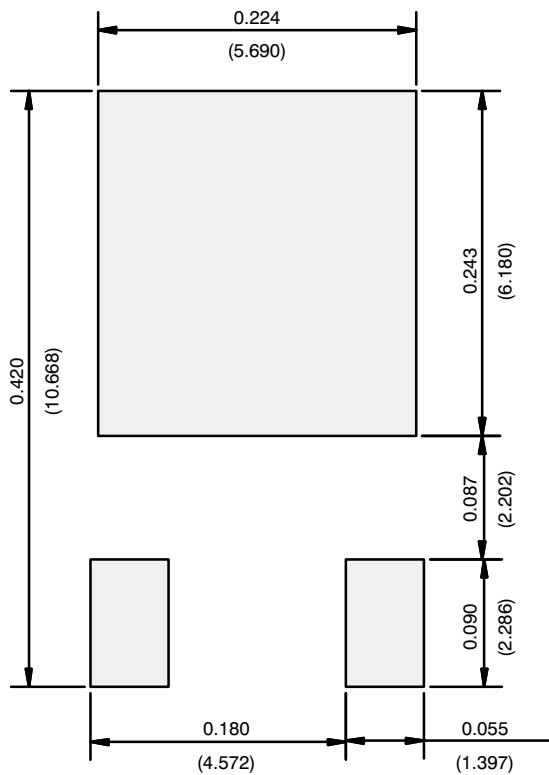


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.14	1.52	0.045	0.060

ECN: X12-0247-Rev. M, 24-Dec-12
 DWG: 5347

Note

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)

Recommended Minimum Pads
Dimensions in Inches/(mm)

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