

SISS27ADN-T1-GE3-VB Datasheet

P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 30	0.004 at $V_{GS} = - 10$ V	- 52	39.5 nC
	0.005 at $V_{GS} = - 4.5$ V	- 47	

FEATURES

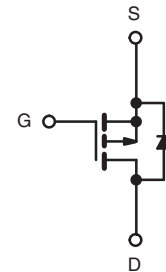
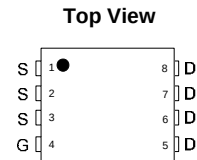
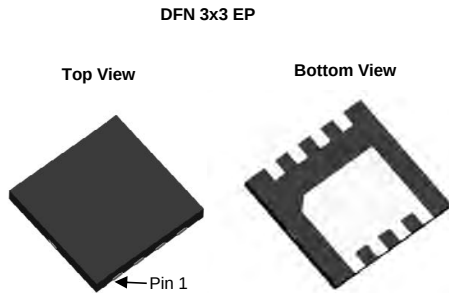
- Halogen-free According to IEC 61249-2-21 Definition
- Trench Power MOSFET
- 100% R_g Tested
- 100% UIS Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Notebook Adapter Switch
- Notebook Load Switch



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	- 52	A
	$T_C = 70^\circ\text{C}$	- 40	
	$T_A = 25^\circ\text{C}$	- 17.3 ^{a, b}	
	$T_A = 70^\circ\text{C}$	- 13.8 ^{a, b}	
Pulsed Drain Current	I_{DM}	- 150	
Continuous Source-Drain Diode Current	$T_C = 25^\circ\text{C}$	- 35 ^d	
	$T_A = 25^\circ\text{C}$	- 3.0 ^{a, b}	
Avalanche Current	I_{AS}	- 20	
Single-Pulse Avalanche Energy	E_{AS}	20	mJ
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	52	W
	$T_C = 70^\circ\text{C}$	33	
	$T_A = 25^\circ\text{C}$	3.7 ^{a, b}	
	$T_A = 70^\circ\text{C}$	2.4 ^{a, b}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	$^\circ\text{C}$
Soldering Recommendations (Peak Temperature) ^{e, f}		260	

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{a, c}	R_{thJA}	26	33	$^\circ\text{C/W}$
Maximum Junction-to-Case	R_{thJC}	1.9	2.4	

Notes:

a. Surface mounted on 1" x 1" FR4 board.

b. $t = 10$ s.

c. Maximum under steady state conditions is 81 $^\circ\text{C/W}$.

d. Package limited.

e. The PowerPAK 1212-8 is a leadless package. The end of the lead terminal is exposed copper (not plated) as a result of the singulation process in manufacturing. A solder fillet at the exposed copper tip cannot be guaranteed and is not required to ensure adequate bottom side solder interconnection.

f. Rework conditions: manual soldering with a soldering iron is not recommended for leadless components.

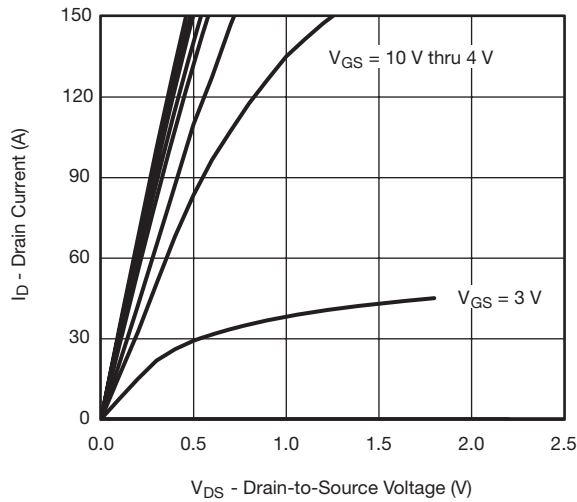
SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 30			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 23		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			5.0		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.0		- 2.5	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} = - 30 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 30 V, V _{GS} = 0 V, T _J = 55 °C			- 5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ - 10 V, V _{GS} = - 10 V	- 30			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 15 A		0.004		Ω
		V _{GS} = - 4.5 V, I _D = - 10 A		0.005		
Forward Transconductance ^a	g _{fs}	V _{DS} = - 10 V, I _D = - 15 A		47		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		4427		pF
Output Capacitance	C _{oss}			452		
Reverse Transfer Capacitance	C _{rss}			430		
Total Gate Charge	Q _g	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 10 A		84.5	126	nC
		V _{DS} = - 15 V, V _{GS} = - 4.5 V, I _D = - 10 A		39.5	60	
Q _{gs}			11			
Q _{gd}			13.5			
Gate Resistance	R _g	f = 1 MHz	0.4	1.8	3.6	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 15 V, R _L = 1.5 Ω I _D ≡ - 10 A, V _{GEN} = - 10 V, R _g = 1 Ω		15	30	ns
Rise Time	t _r			13	26	
Turn-Off DelayTime	t _{d(off)}			55	100	
Fall Time	t _f			10	20	
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 15 V, R _L = 1.5 Ω I _D ≡ - 10 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		55	100	
Rise Time	t _r			42	80	
Turn-Off DelayTime	t _{d(off)}			52	100	
Fall Time	t _f			17	34	
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I _S	T _C = 25 °C			- 35	A
Pulse Diode Forward Current	I _{SM}				- 80	
Body Diode Voltage	V _{SD}	I _S = - 3 A, V _{GS} = 0 V		- 0.74	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 10 A, dI/dt = 100 A/μs, T _J = 25 °C		14	24	ns
Body Diode Reverse Recovery Charge	Q _{rr}			4	8	nC
Reverse Recovery Fall Time	t _a			8		ns
Reverse Recovery Rise Time	t _b			6		

Notes:

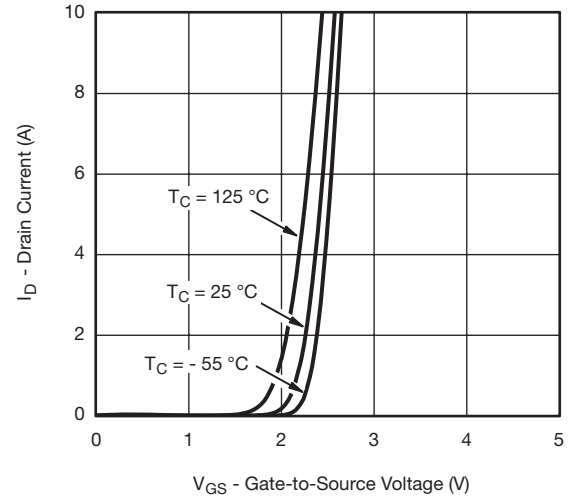
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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.

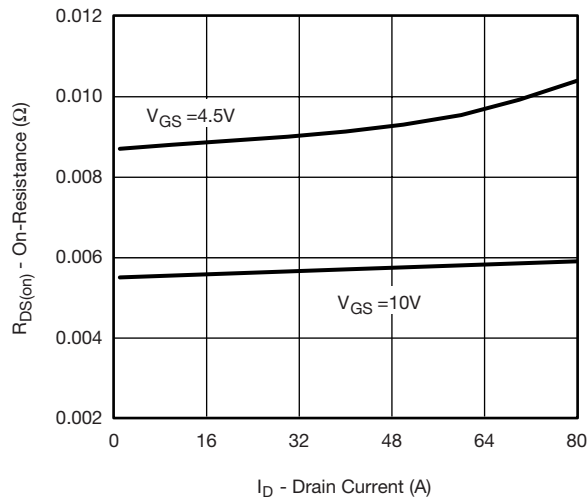
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



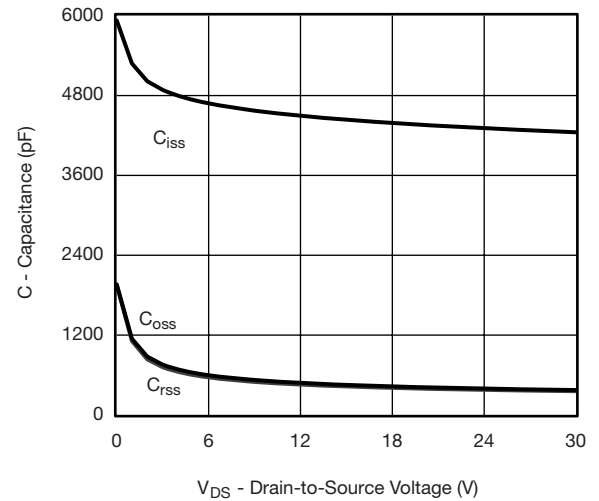
Output Characteristics



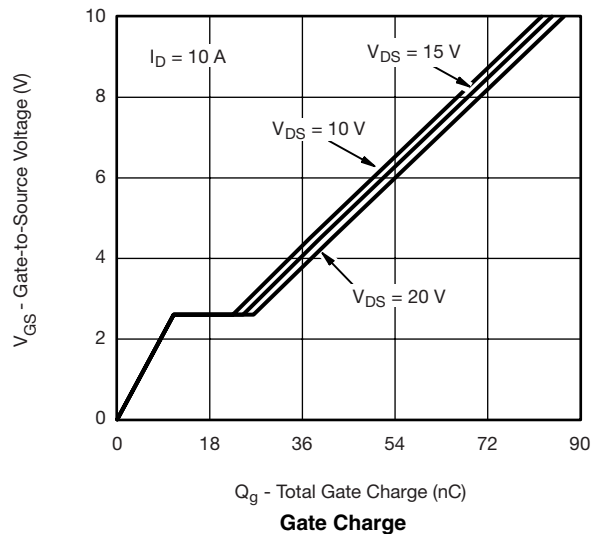
Transfer Characteristics



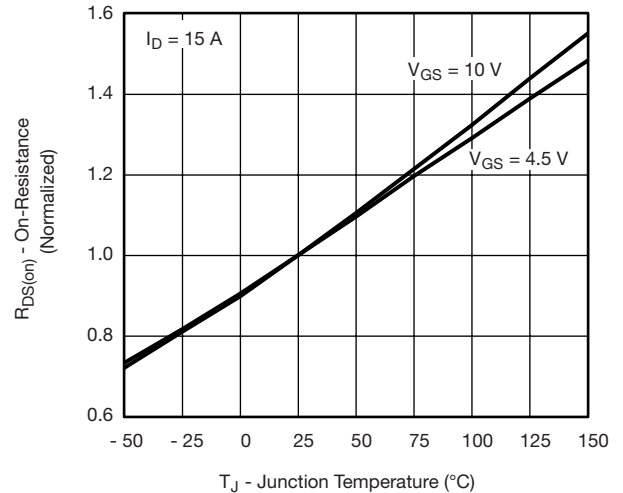
On-Resistance vs. Drain Current



Capacitance

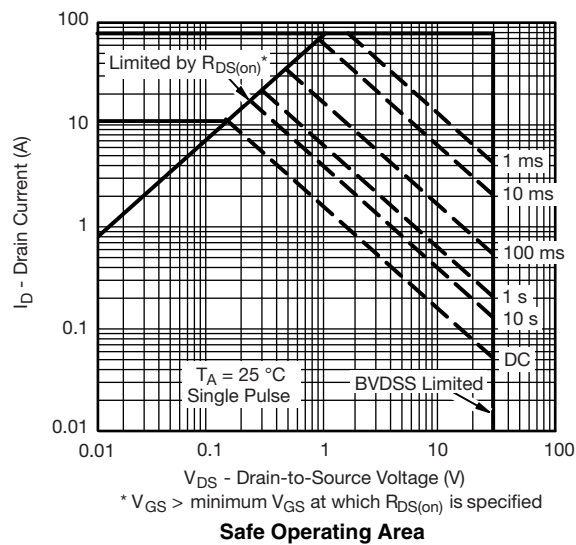
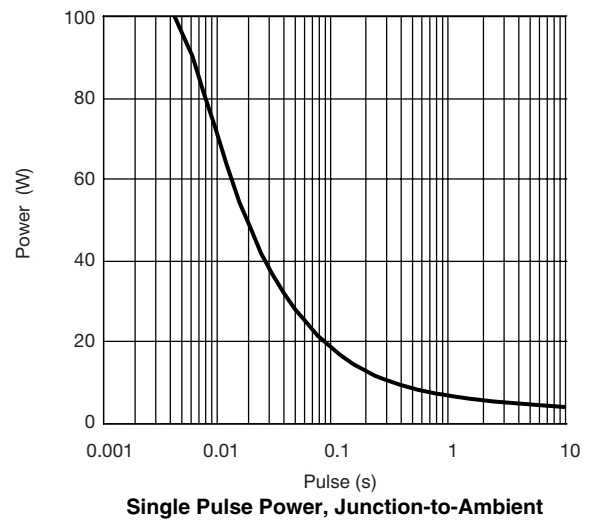
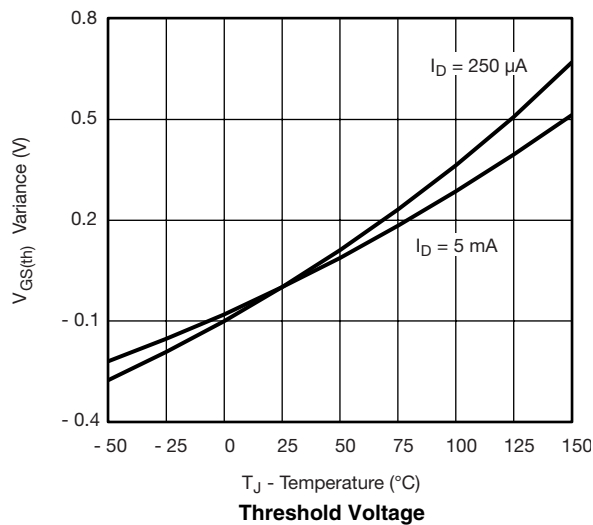
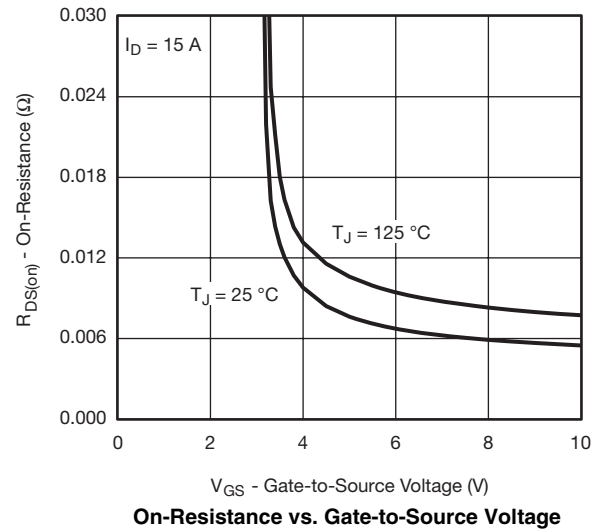
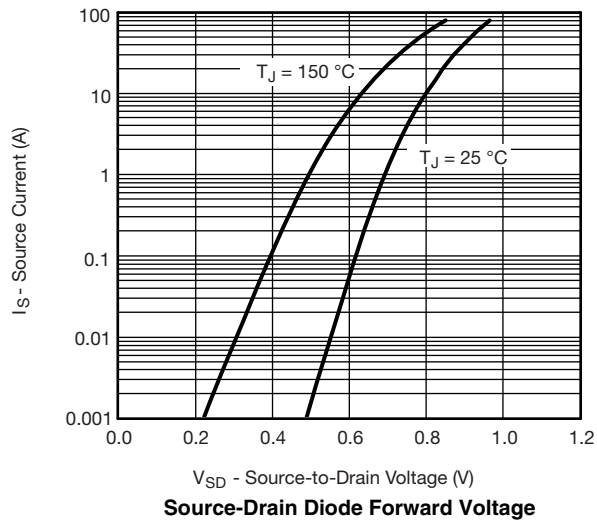


Gate Charge

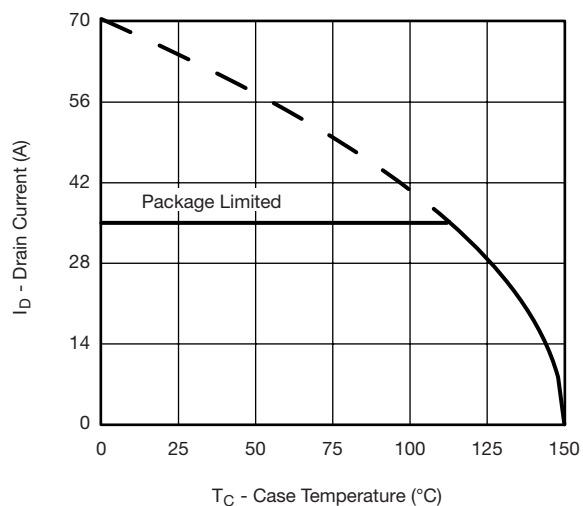


On-Resistance vs. Junction Temperature

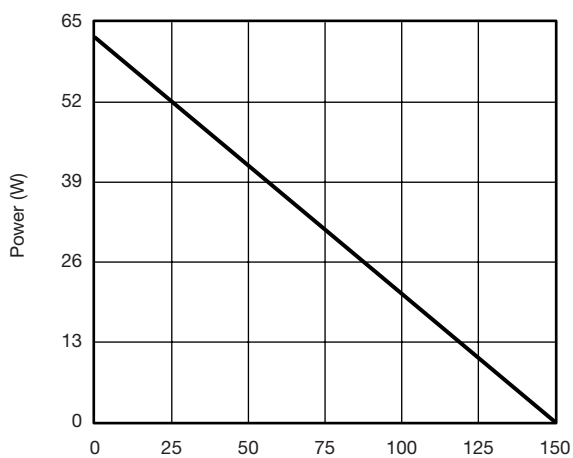
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



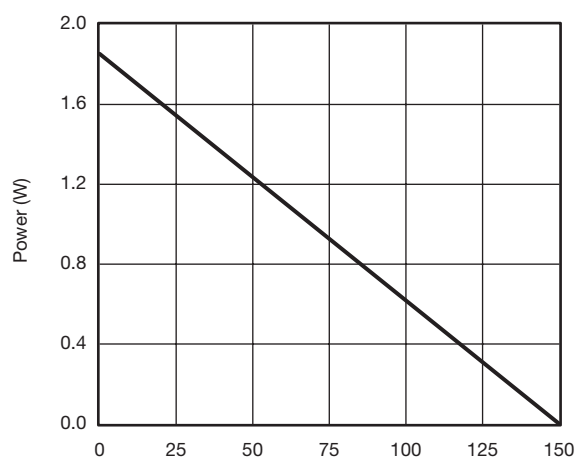
MOSFET TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Current Derating*



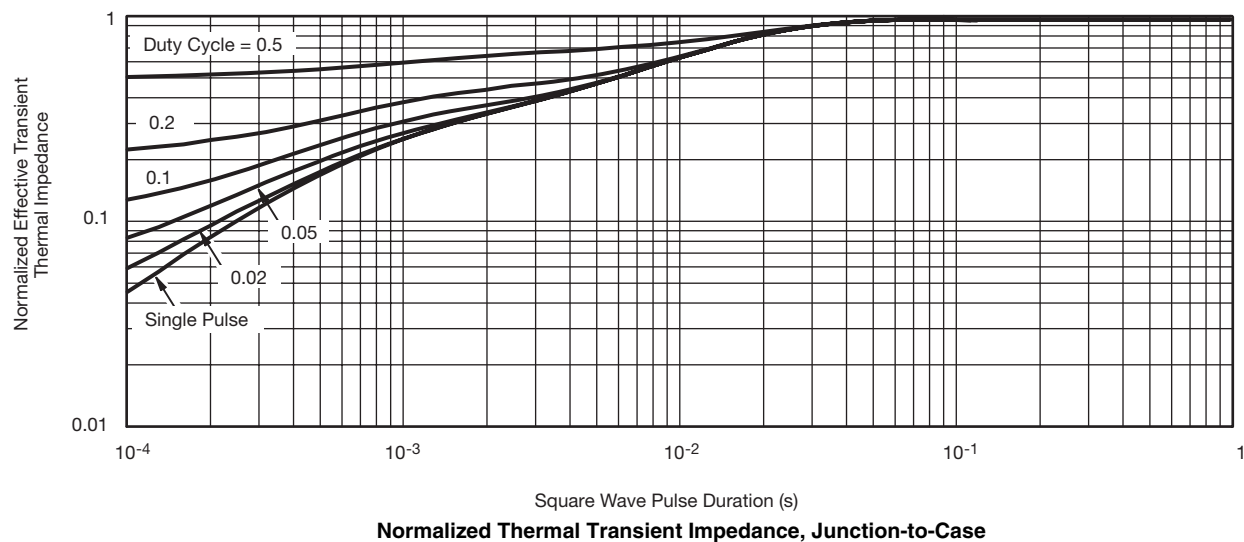
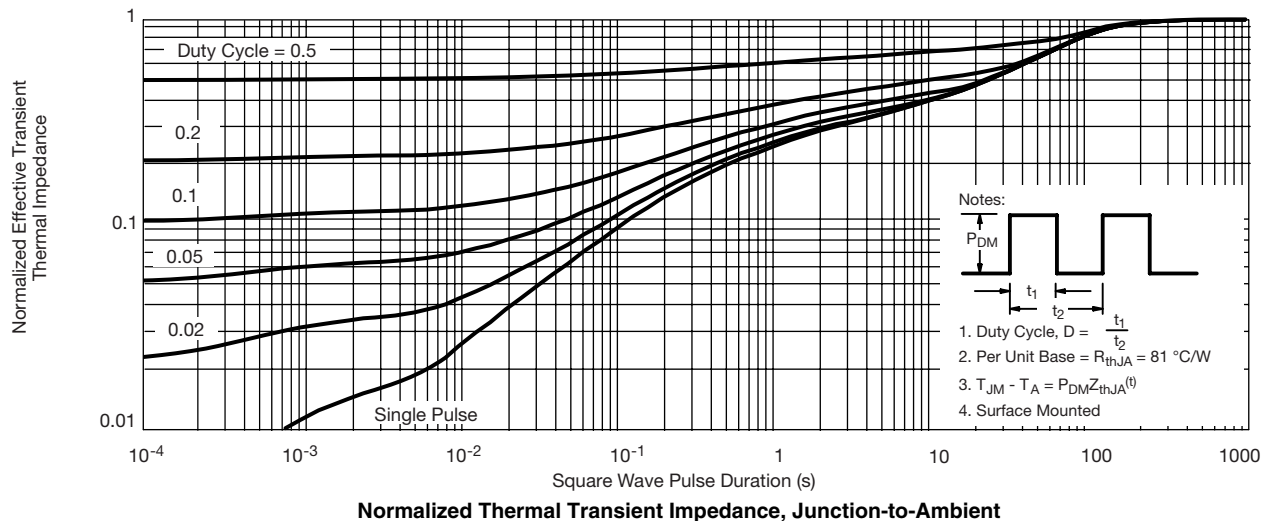
Power, Junction-to-Case

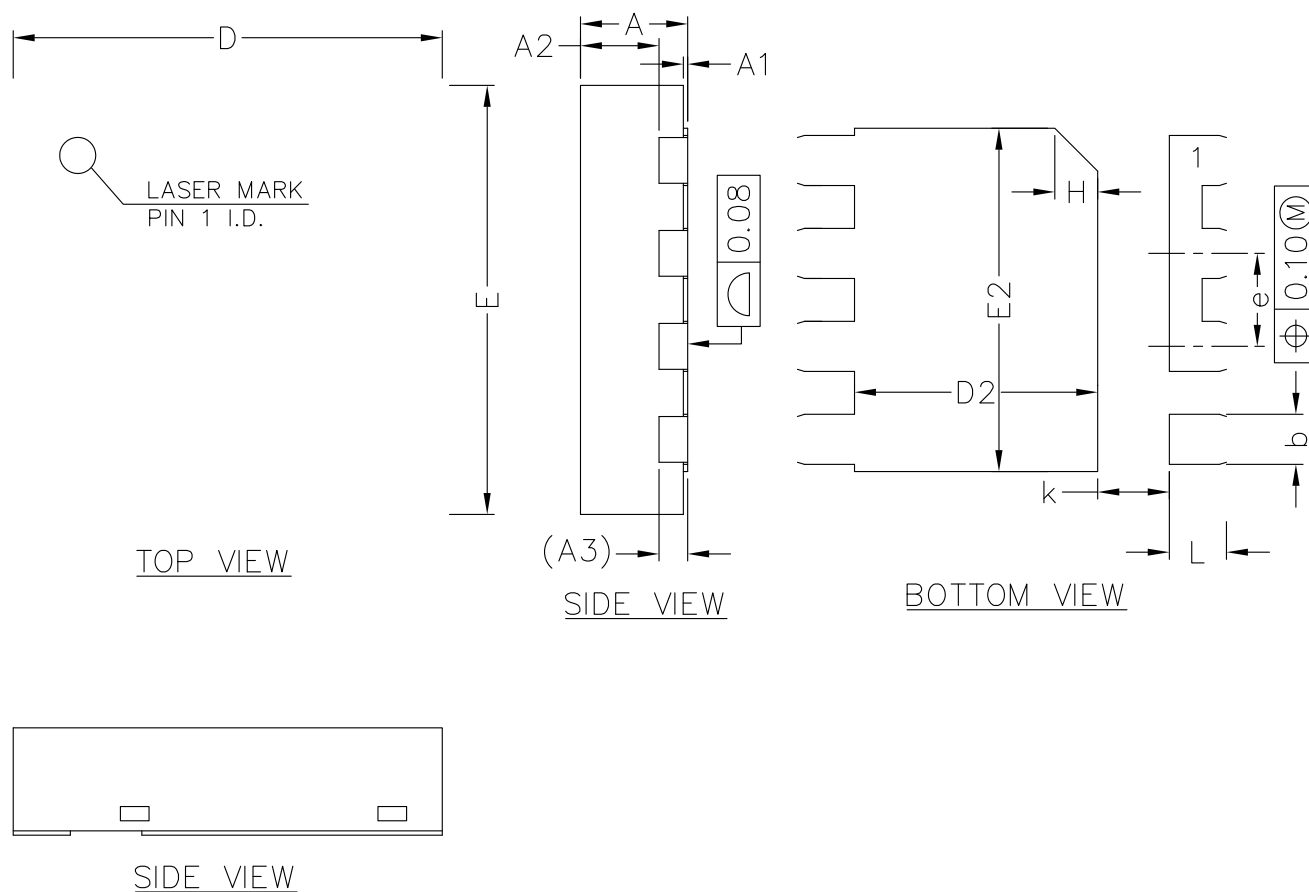


Power, Junction-to-Ambient

* 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





COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	0.00	0.02	0.05
A2	0.50	0.55	0.60
A3	0.20REF		
b	0.30	0.35	0.40
D	2.90	3.00	3.10
E	2.90	3.00	3.10
D2	1.60	1.70	1.80
E2	2.30	2.40	2.50
e	0.55	0.65	0.75
K	0.40	0.50	0.60
L	0.35	0.40	0.45

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