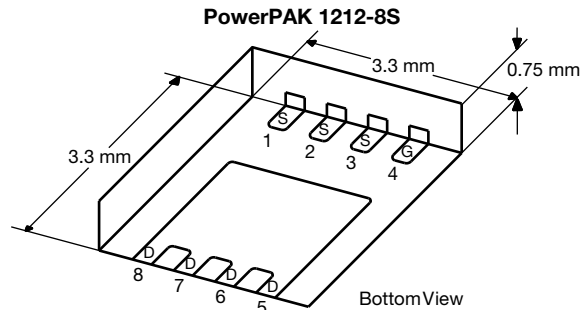


N-Channel 150 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) (MAX.)	I_D (A) ^f	Q_g (TYP.)
150	0.058 at $V_{GS} = 10$ V	20.2	7.6 nC
	0.085 at $V_{GS} = 7.5$ V	16.6	



Ordering Information:
SiS888DN-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

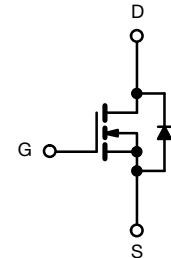
- ThunderFET® technology optimizes balance of $R_{DS(on)}$, Q_g , Q_{sw} and Q_{oss}
- 100 % R_g and UIS tested
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Primary side switch
- Synchronous rectification
- DC/DC conversion
- Load switching
- Boost converters
- DC/AC inverters



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25$ °C, unless otherwise noted)				
PARAMETER		SYMBOL	LIMIT	UNIT
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150$ °C)	$T_C = 25$ °C	I_D	20.2	A
	$T_C = 70$ °C		16	
	$T_A = 25$ °C		5.3 ^{a,b}	
	$T_A = 70$ °C		4.3 ^{a,b}	
Pulsed Drain Current ($t = 300$ μ s)		I_{DM}	50	
Continuous Source-Drain Diode Current	$T_C = 25$ °C	I_S	40 ^g	
	$T_A = 25$ °C		3.1 ^{a,b}	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	10	
Single Pulse Avalanche Energy		E_{AS}	5	mJ
Maximum Power Dissipation	$T_C = 25$ °C	P_D	52	W
	$T_C = 70$ °C		33	
	$T_A = 25$ °C		3.7 ^{a,b}	
	$T_A = 70$ °C		2.4 ^{a,b}	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C
Soldering Recommendations (Peak Temperature) ^{c,d}			260	

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient ^{a,e}	$t \leq 10$ s	R_{thJA}	26	33	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R_{thJC}	1.9	2.4	

Notes

- Surface mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- See solder profile (www.vishay.com/doc?73257). The PowerPAK 1212-8S 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.
- Rework conditions: Manual soldering with a soldering iron is not recommended for leadless components.
- Maximum under steady state conditions is 81 °C/W.
- Based on $T_C = 25$ °C.
- 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}	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	150			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$		97		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			-6.9		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	3		4.2	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}	$V_{DS} = 150\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 150\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$		0.048	0.058	Ω
		$V_{GS} = 7.5\text{ V}$, $I_D = 7\text{ A}$		0.066	0.085	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 10\text{ A}$		11		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 75\text{ V}$, $V_{GS} = 0\text{ V}$, $f = 1\text{ MHz}$		420		pF
Output Capacitance	C_{oss}			130		
Reverse Transfer Capacitance	C_{rss}			16		
Total Gate Charge	Q_g	$V_{DS} = 75\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 10\text{ A}$		9.5	14.5	nC
Gate-Source Charge	Q_{gs}	$V_{DS} = 75\text{ V}$, $V_{GS} = 7.5\text{ V}$, $I_D = 10\text{ A}$		7.6	11.5	
Gate-Drain Charge	Q_{gd}			2.5		
Output Charge	Q_{oss}			3.6		
Gate Resistance	R_g	$V_{DS} = 75\text{ V}$, $V_{GS} = 0\text{ V}$		23.6	36	Ω
Turn-On Delay Time	$t_{d(on)}$	$f = 1\text{ MHz}$	0.4	1.3	2	
Rise Time	t_r	$V_{DD} = 75\text{ V}$, $R_L = 7.5\text{ }\Omega$ $I_D \equiv 10\text{ A}$, $V_{GEN} = 7.5\text{ V}$, $R_g = 1\text{ }\Omega$		13	26	ns
Turn-Off Delay Time	$t_{d(off)}$			11	22	
Fall Time	t_f			14	28	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 75\text{ V}$, $R_L = 7.5\text{ }\Omega$ $I_D \equiv 10\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_g = 1\text{ }\Omega$		9	18	
Rise Time	t_r			12	24	
Turn-Off Delay Time	$t_{d(off)}$			8	16	
Fall Time	t_f			13	26	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			40	A
Pulse Diode Forward Current ^a	I_{SM}				50	
Body Diode Voltage	V_{SD}	$I_S = 4\text{ A}$, $V_{GS} = 0\text{ V}$		0.85	1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$, $T_J = 25\text{ }^\circ\text{C}$		94	180	ns
Body Diode Reverse Recovery Charge	Q_{rr}			190	380	nC
Reverse Recovery Fall Time	t_a			35		ns
Reverse Recovery Rise Time	t_b			59		

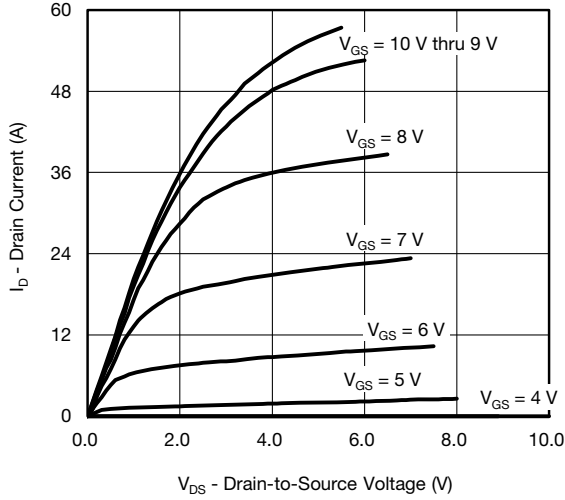
Notes

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

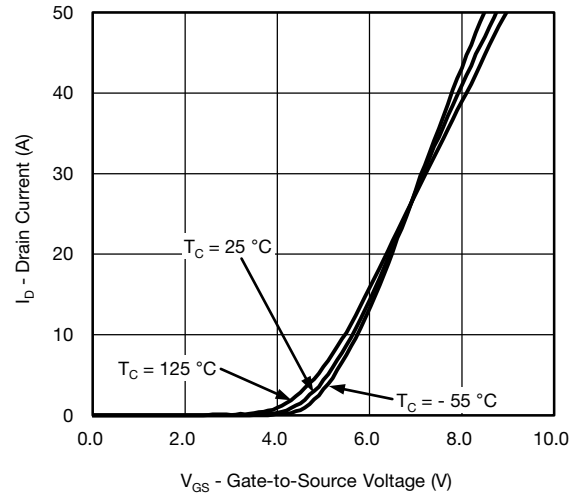
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



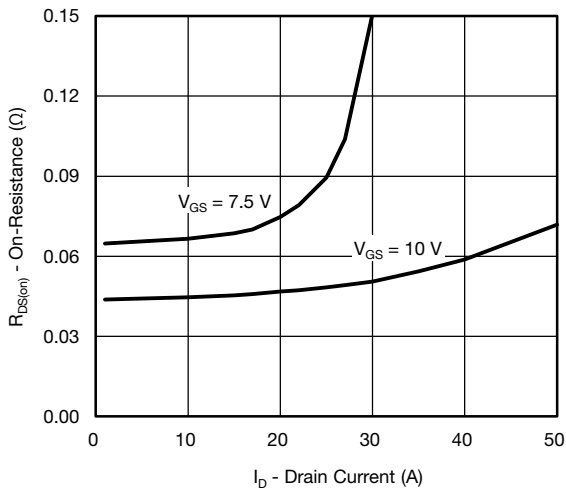
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



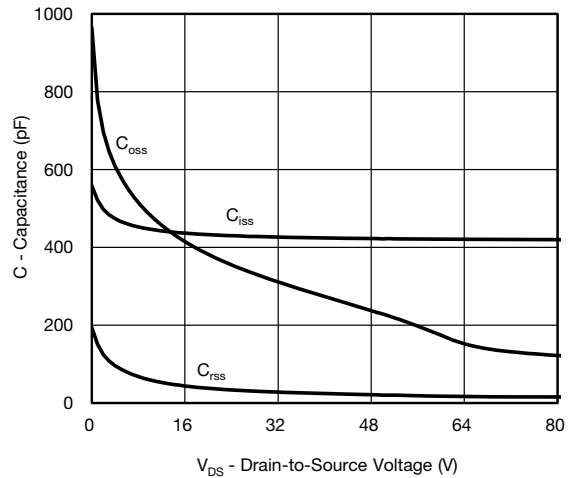
Output Characteristics



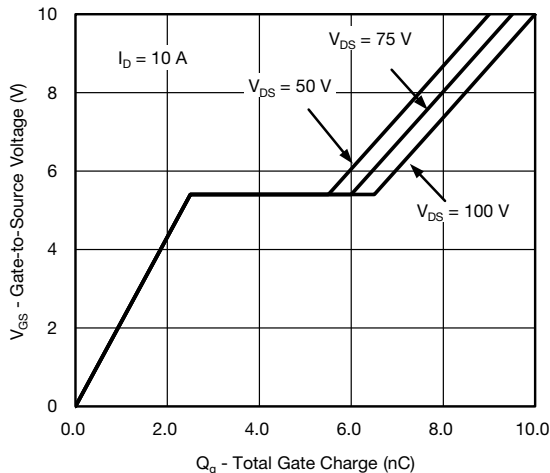
Transfer Characteristics



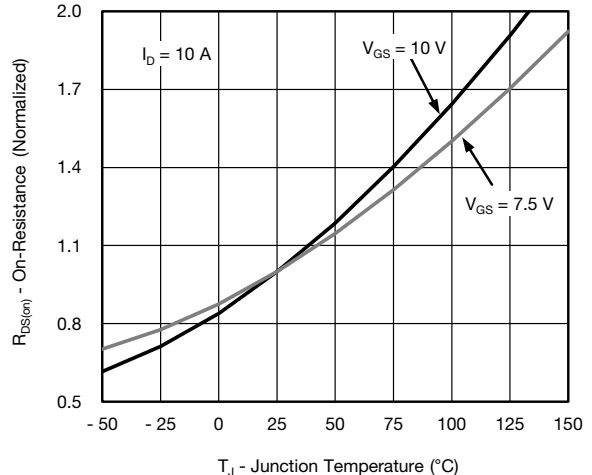
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



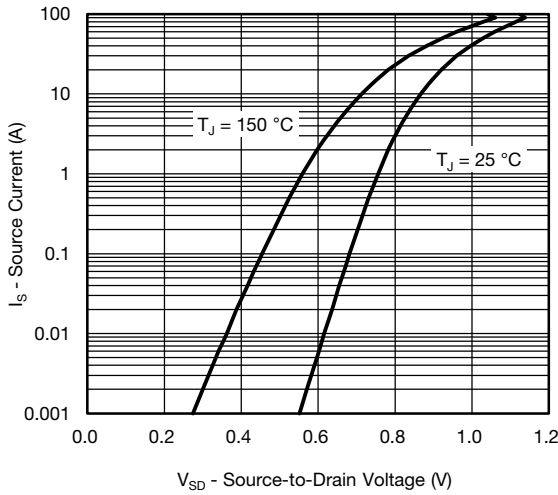
Gate Charge



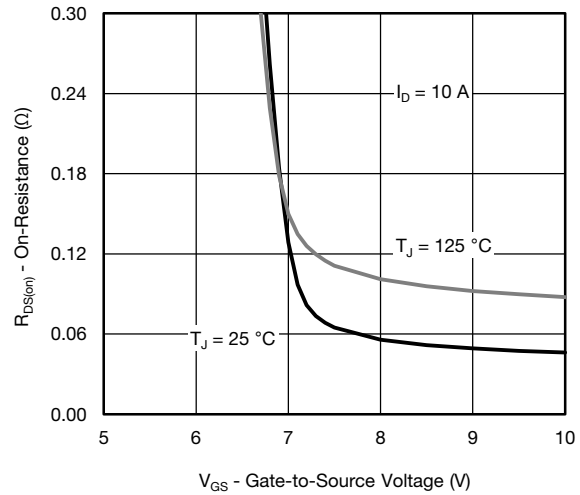
On-Resistance vs. Junction Temperature



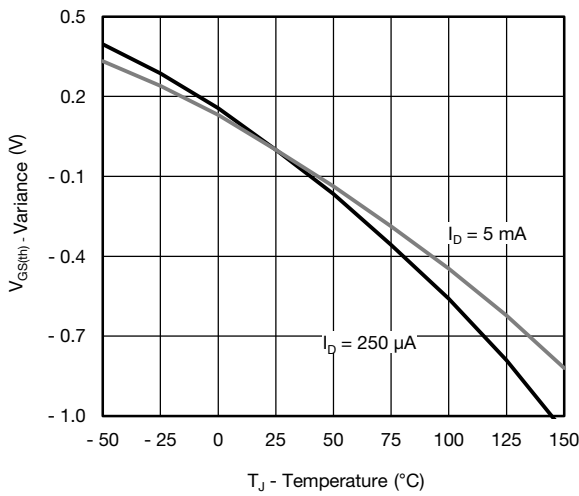
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



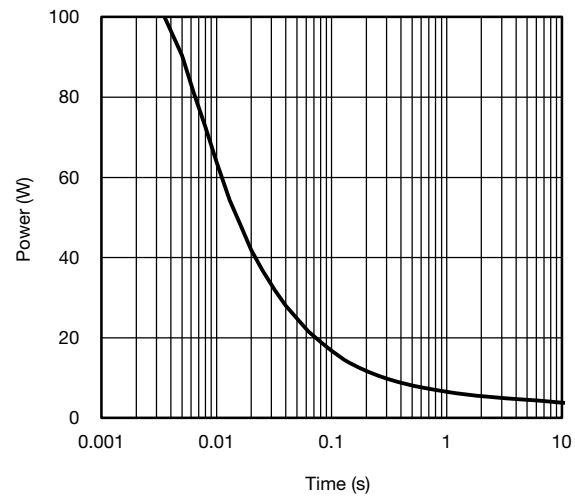
Source-Drain Diode Forward Voltage



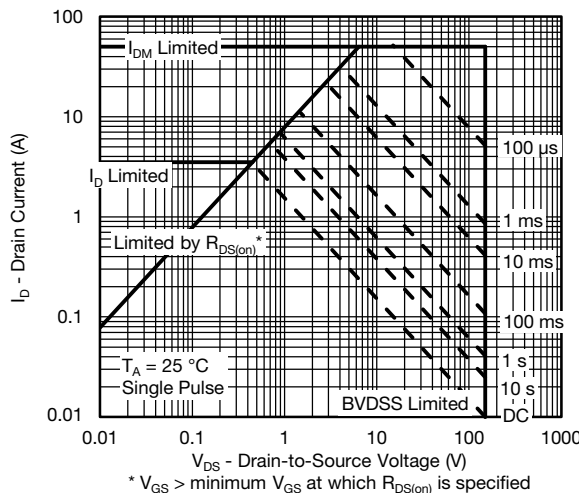
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



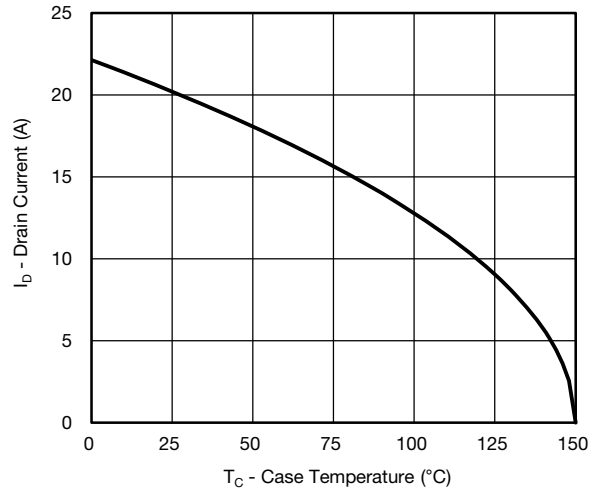
Single Pulse Power, Junction-to-Ambient



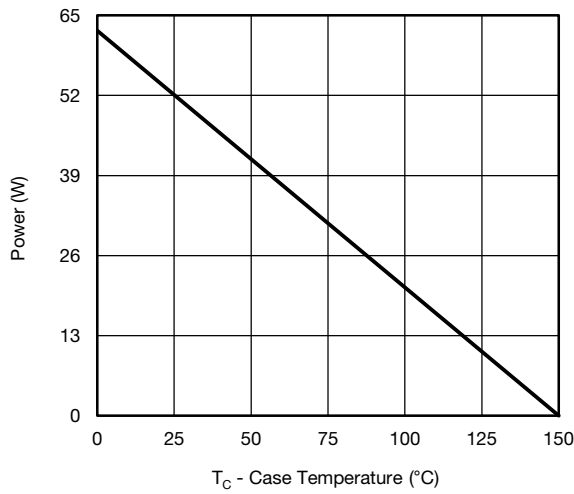
Safe Operating Area, Junction-to-Ambient



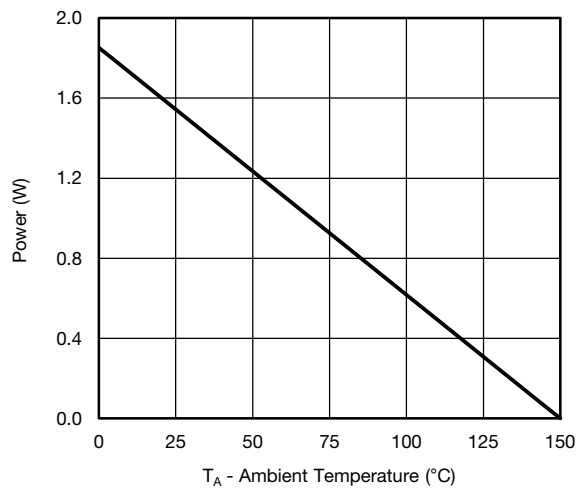
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating*



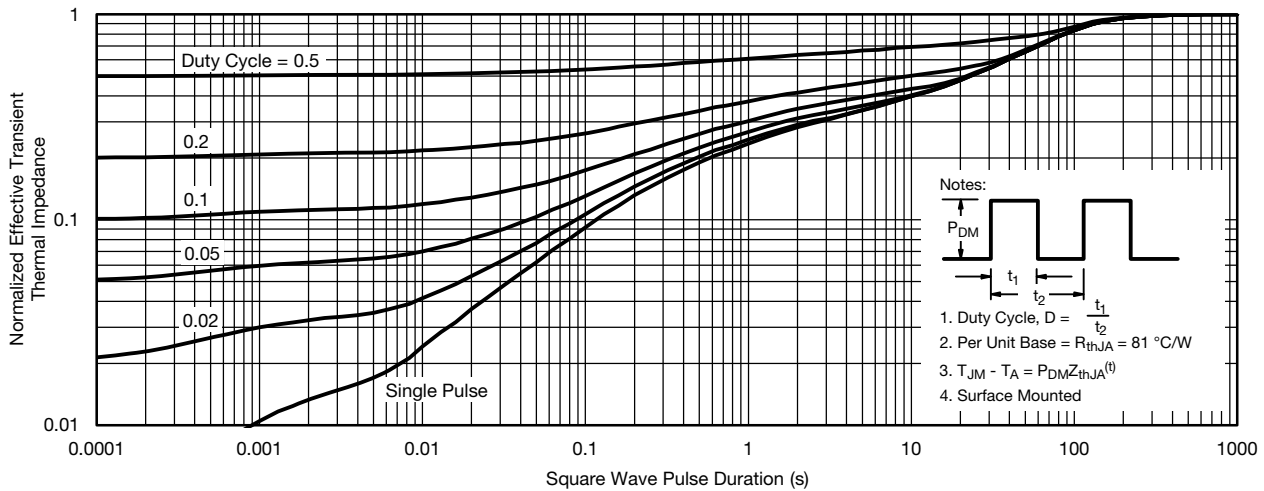
Power, Junction-to-Case



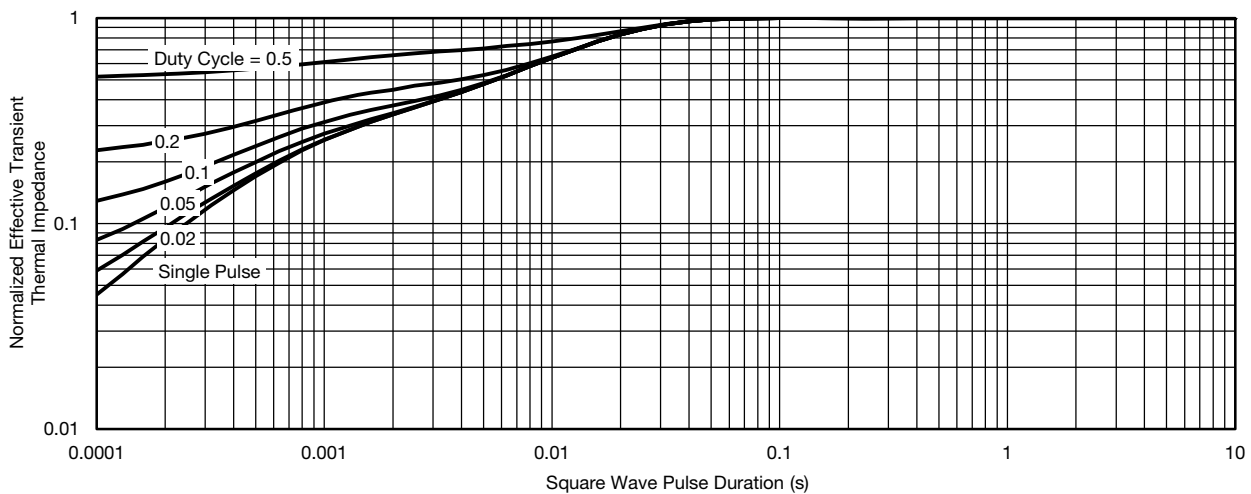
Power, Junction-to-Ambient

* 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)



Normalized Thermal Transient Impedance, Junction-to-Ambient

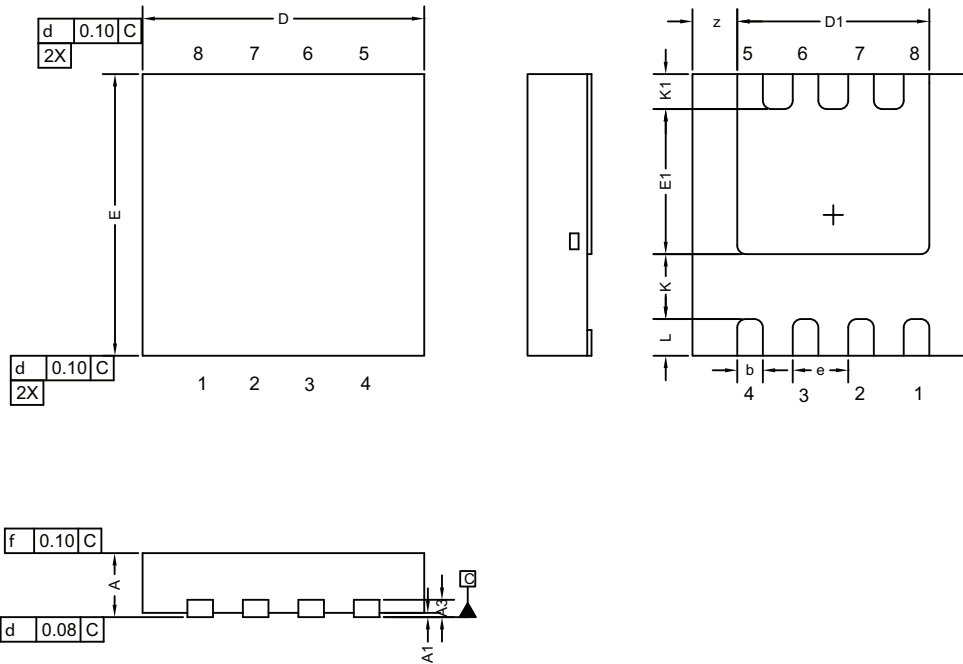


Normalized Thermal Transient Impedance, Junction-to-Case

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?63548.



Case Outline for PowerPAK® 1212-8S



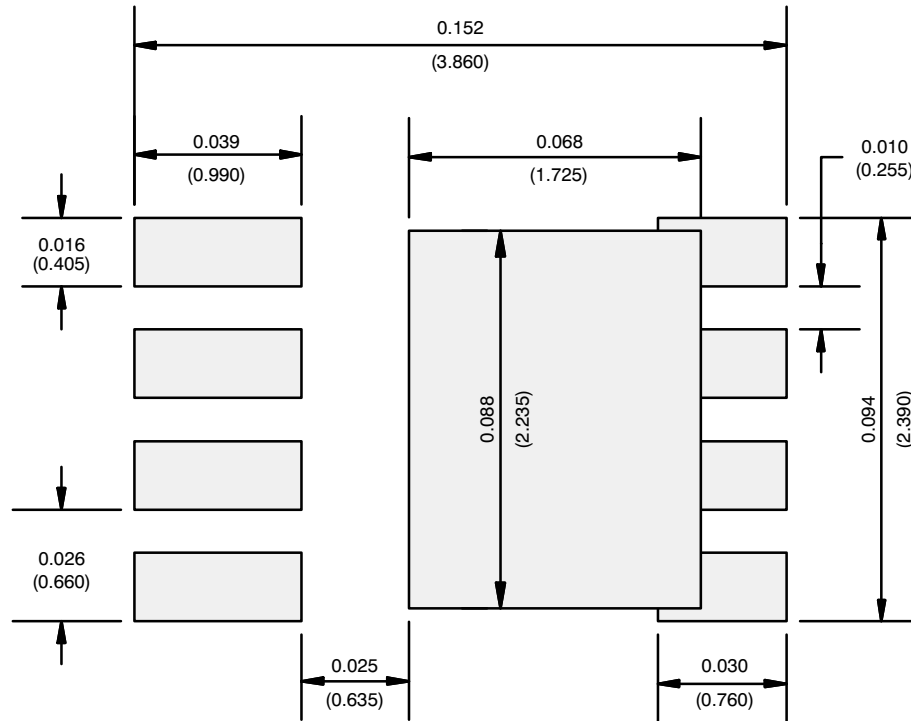
DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.67	0.75	0.83	0.027	0.030	0.033
A1	0	-	0.05	0	-	0.002
A3	0.20 REF			0.008 REF		
b	0.30 BSC			0.012 BSC		
D	3.30 BSC			0.130 BSC		
D1	2.15	2.25	2.35	0.084	0.088	0.092
E	3.30 BSC			0.130 BSC		
E1	1.60	1.70	1.80	0.063	0.067	0.071
e	0.65 BSC			0.026 BSC		
K	0.76 TYP			0.030 TYP		
K1	0.41 TYP			0.016 TYP		
L	0.43 BSC			0.017 BSC		
z	0.525 TYP			0.021 TYP		

ECN: C12-0200-Rev. A, 12-Mar-12
DWG: 6008

Note

- Millimeters will govern.

RECOMMENDED MINIMUM PADS FOR PowerPAK® 1212-8 Single



Recommended Minimum Pads
Dimensions in Inches/(mm)

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