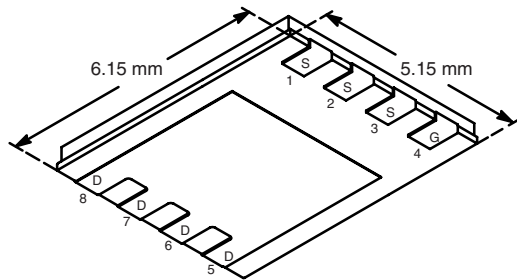




## N-Channel 20 V (D-S) MOSFET

PRODUCT SUMMARY			
$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>a</sup>	$Q_g$ (Typ.)
20	0.0023 at $V_{GS} = 10$ V	50	41 nC
	0.0026 at $V_{GS} = 4.5$ V	50	
	0.0034 at $V_{GS} = 2.5$ V	50	

PowerPAK<sup>®</sup> SO-8

Bottom View

Ordering Information: SiR800DP-T1-GE3 (Lead (Pb)-free and Halogen-free)

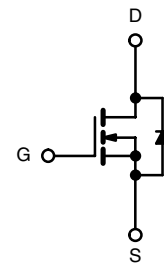
### FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET<sup>®</sup> Gen III Power MOSFET
- 100 %  $R_g$  Tested
- 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC


**RoHS**  
 COMPLIANT  
 HALOGEN  
 FREE

### APPLICATIONS

- DC/DC
- Low Voltage Drive
- POL
- OR-ing
- Fixed Telecom



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	
Continuous Drain Current ( $T_J = 150$ °C)	$I_D$	$T_C = 25$ °C	50 <sup>a</sup>
		$T_C = 70$ °C	50 <sup>a</sup>
		$T_A = 25$ °C	35.4 <sup>b, c</sup>
		$T_A = 70$ °C	28.2 <sup>b, c</sup>
Pulsed Drain Current	$I_{DM}$	80	A
Continuous Source-Drain Diode Current	$I_S$	$T_C = 25$ °C	
		$T_A = 25$ °C	6.2 <sup>b, c</sup>
Single Pulse Avalanche Current	$I_{AS}$	30	mJ
Single Pulse Avalanche Energy	$E_{AS}$	45	
Maximum Power Dissipation	$P_D$	$T_C = 25$ °C	69
		$T_C = 70$ °C	44.4
		$T_A = 25$ °C	5.2 <sup>b, c</sup>
		$T_A = 70$ °C	3.3 <sup>b, c</sup>
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 150	°C
Soldering Recommendations (Peak Temperature) <sup>d, e</sup>		260	

### THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b, f</sup>	$t \leq 10$ s	$R_{thJA}$	19	24	°C/W
Maximum Junction-to-Case (Drain)	Steady State	$R_{thJC}$	1.2	1.8	

Notes:

a. Package limited.

b. Surface Mounted on 1" x 1" FR4 board.

c.  $t = 10$  s.d. See Solder Profile ([www.vishay.com/ppg?73257](http://www.vishay.com/ppg?73257)). The PowerPAK SO-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.

e. Rework Conditions: manual soldering with a soldering iron is not recommended for leadless components.

f. Maximum under Steady State conditions is 65 °C/W.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	20			V
$V_{DS}$ Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$		18		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 4.1		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	0.6		1.5	V
Gate-Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 12\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 20\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	40			A
Drain-Source On-State Resistance <sup>a</sup>	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		0.0019	0.0023	$\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 12\text{ A}$		0.0021	0.0026	
		$V_{GS} = 2.5\text{ V}, I_D = 10\text{ A}$		0.0028	0.0034	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = 10\text{ V}, I_D = 15\text{ A}$		96		S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		5125		pF
Output Capacitance	$C_{oss}$			1050		
Reverse Transfer Capacitance	$C_{rss}$			510		
Total Gate Charge	$Q_g$	$V_{DS} = 10\text{ V}, V_{GS} = 10\text{ V}, I_D = 10\text{ A}$		89	133	nC
		$V_{DS} = 15\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		41	62	
$Q_{gs}$			7.4			
$Q_{gd}$			7.6			
Gate Resistance	$R_g$	$f = 1\text{ MHz}$	0.4	1.2	2.4	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 1\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		13	25	ns
Rise Time	$t_r$			8	16	
Turn-Off Delay Time	$t_{d(off)}$			54	100	
Fall Time	$t_f$			10	20	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}, R_L = 1\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 4.5\text{ V}, R_g = 1\text{ }\Omega$		27	50	
Rise Time	$t_r$			15	30	
Turn-Off Delay Time	$t_{d(off)}$			70	120	
Fall Time	$t_f$			27	50	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Source-Drain Diode Current	$I_S$	$T_C = 25\text{ }^\circ\text{C}$			50	A
Pulse Diode Forward Current <sup>a</sup>	$I_{SM}$				80	
Body Diode Voltage	$V_{SD}$	$I_S = 5\text{ A}$		0.65	1.1	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		30	60	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$			17	34	nC
Reverse Recovery Fall Time	$t_a$			16		ns
Reverse Recovery Rise Time	$t_b$			14		

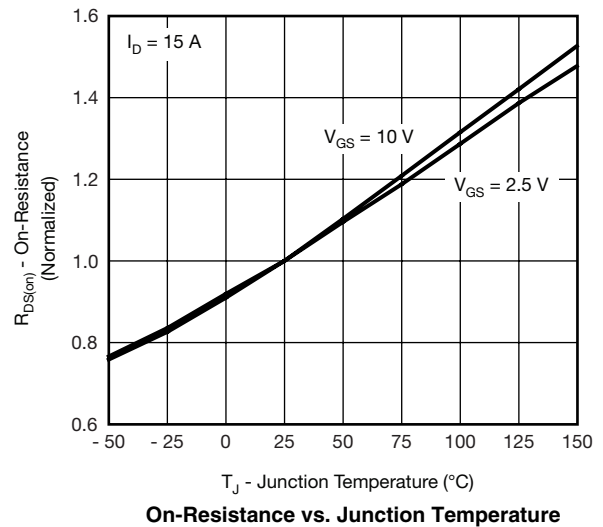
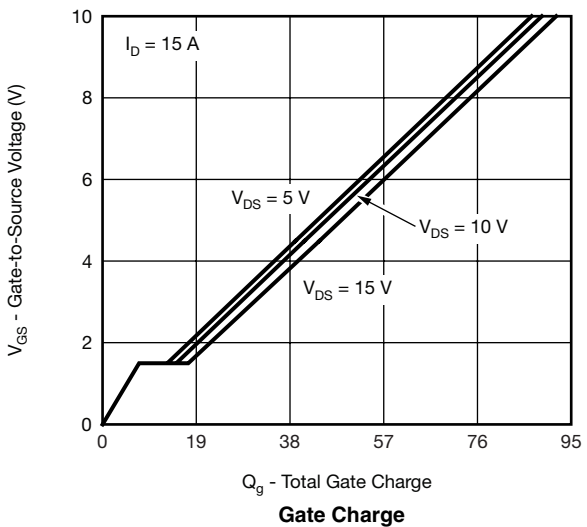
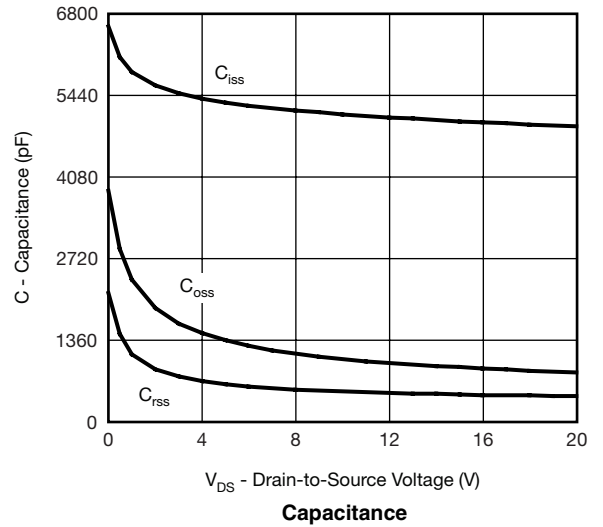
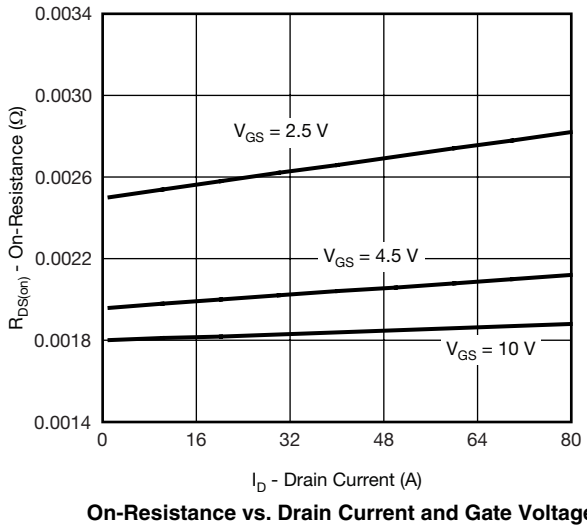
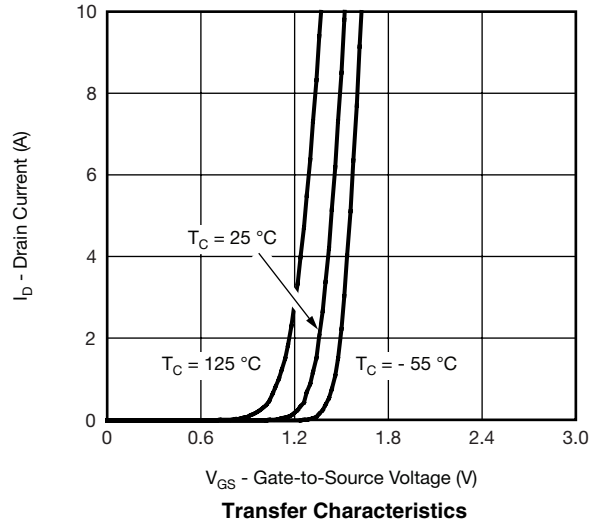
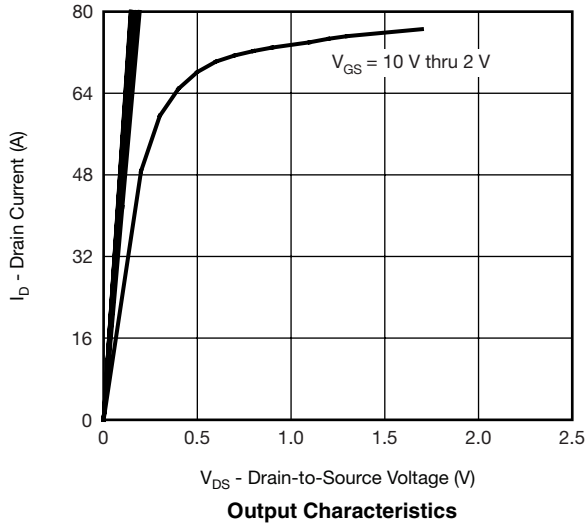
## Notes:

- 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

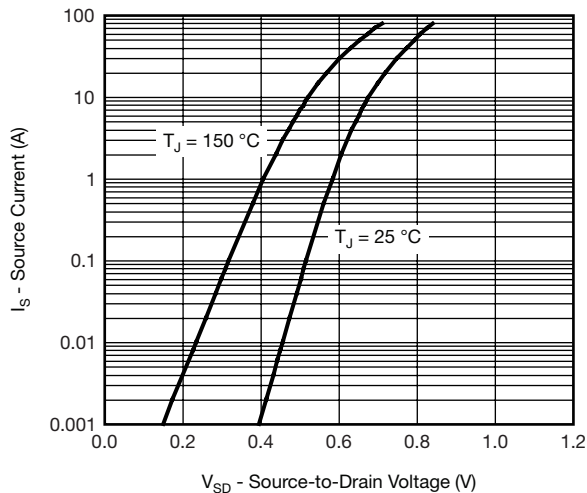


# SiR800DP

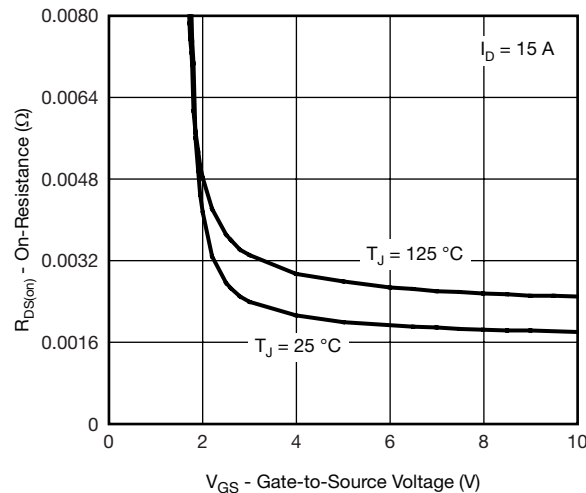
Vishay Siliconix



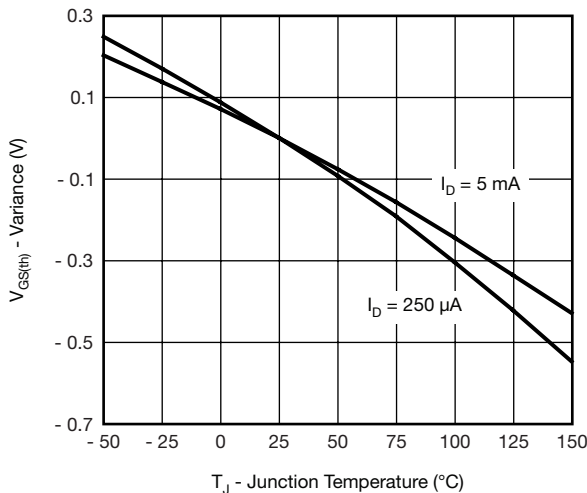
## TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



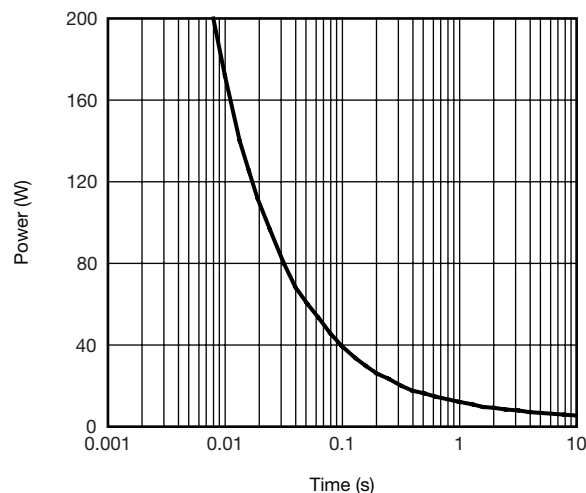
Source-Drain Diode Forward Voltage



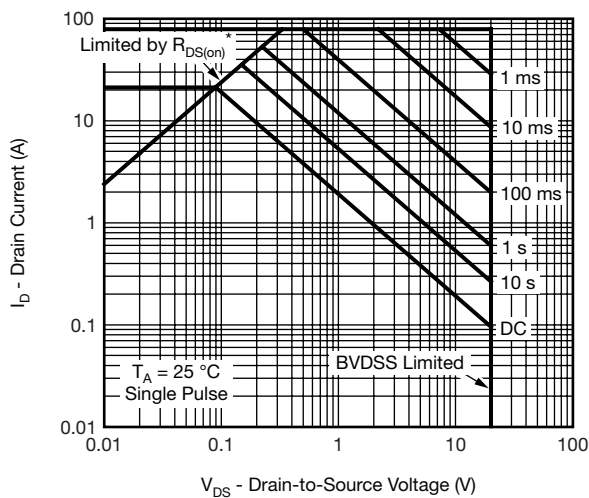
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



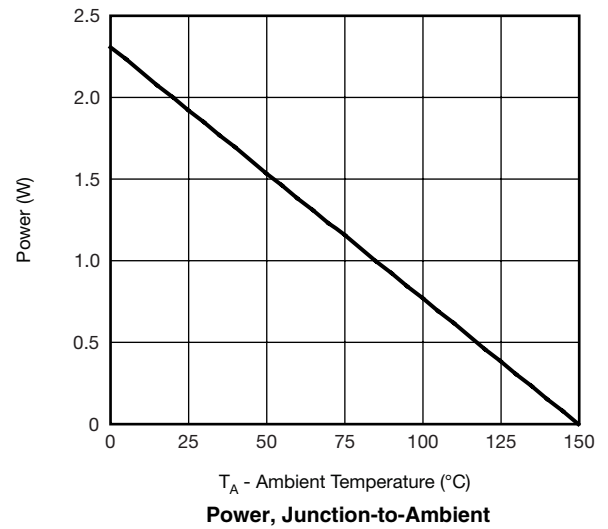
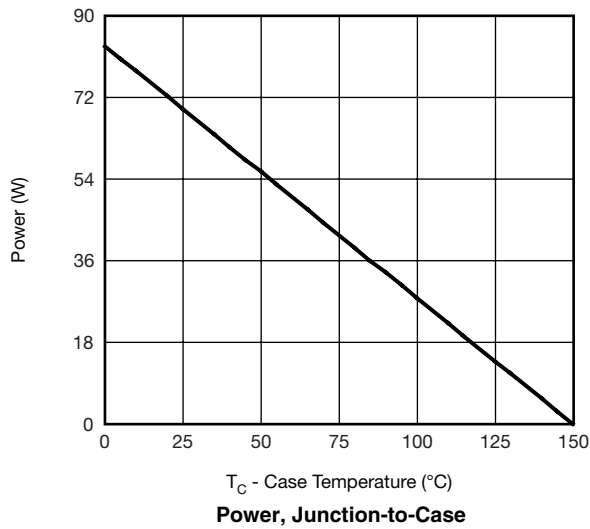
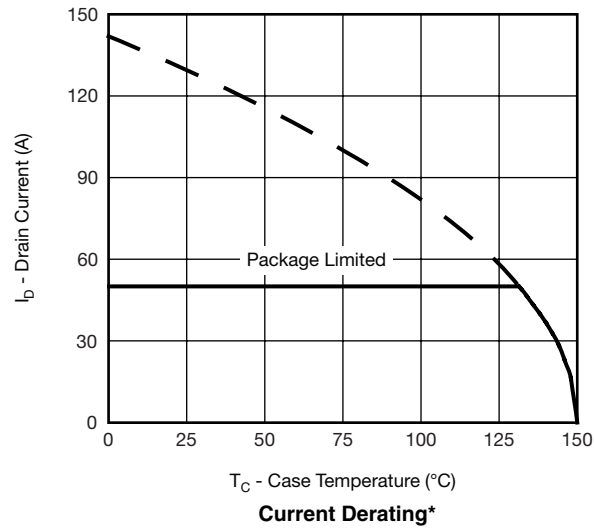
Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Ambient



**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



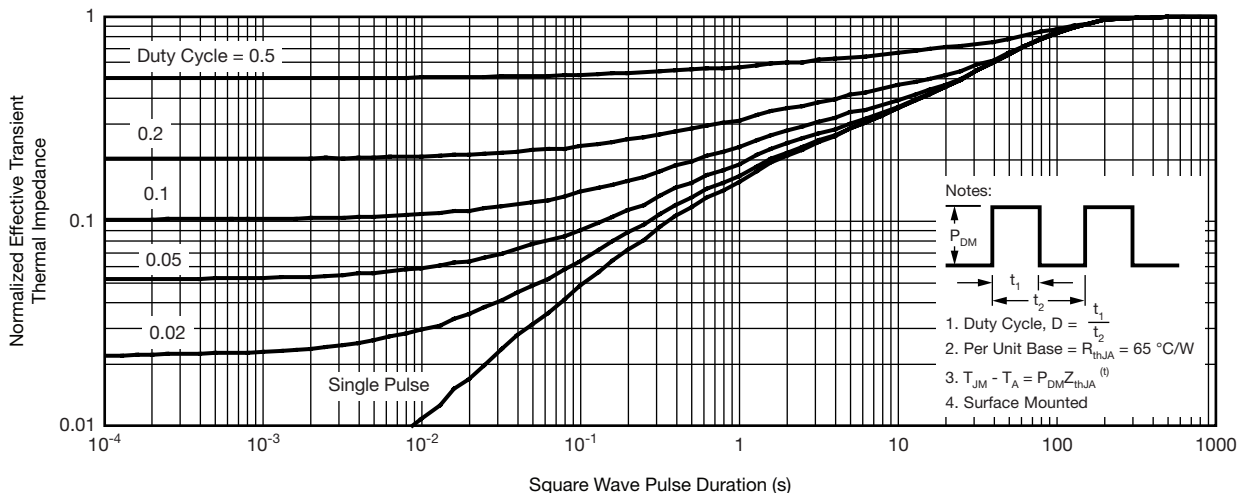
\* The power dissipation  $P_D$  is based on  $T_{J(max)} = 150$  °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

# SiR800DP

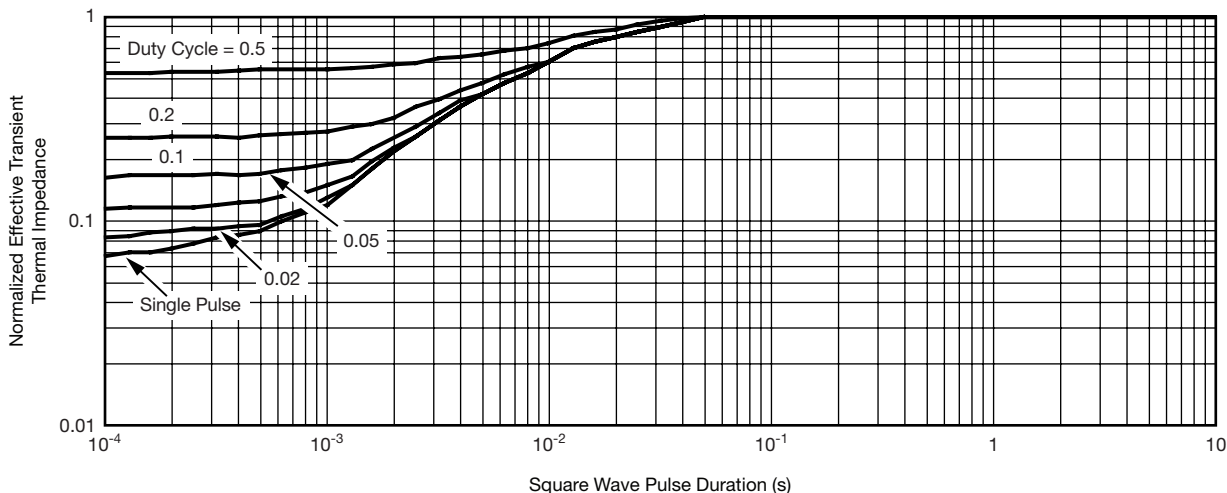
Vishay Siliconix



## 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/ppq?65738](http://www.vishay.com/ppq?65738).



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- Консультации по применению компонента;
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- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

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