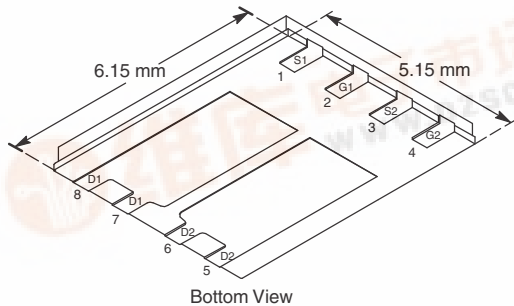


Dual P-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^a	Q_g (Typ.)
- 30	0.0055 at $V_{GS} = -10$ V	- 60	51 nC
	0.0078 at $V_{GS} = -4.5$ V	- 60	

PowerPAK® SO-8



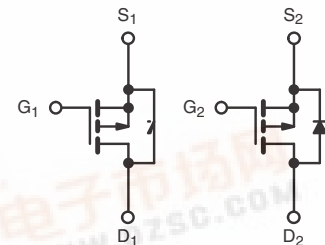
Ordering Information: Si7997DP-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

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



RoHS
COMPLIANT
HALOGEN
FREE



P-Channel MOSFET 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	- 60 ^a
		$T_C = 70$ °C	- 60 ^a
		$T_A = 25$ °C	- 20.8 ^{b, c}
		$T_A = 70$ °C	- 16.6 ^{b, c}
Pulsed Drain Current	I_{DM}	- 100	A
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	
		$T_A = 25$ °C	- 2.9 ^{b, c}
Single Pulse Avalanche Current	I_{AS}	- 30	mJ
Single Pulse Avalanche Energy			
Maximum Power Dissipation	P_D	$T_C = 25$ °C	46
		$T_C = 70$ °C	29
		$T_A = 25$ °C	3.5 ^{b, c}
		$T_A = 70$ °C	2.2 ^{b, c}
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C
Soldering Recommendations (Peak Temperature) ^{d, e}		260	

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{b, f}	R_{thJA}	26	35	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	2.2	2.7	

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). 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 85 °C/W.

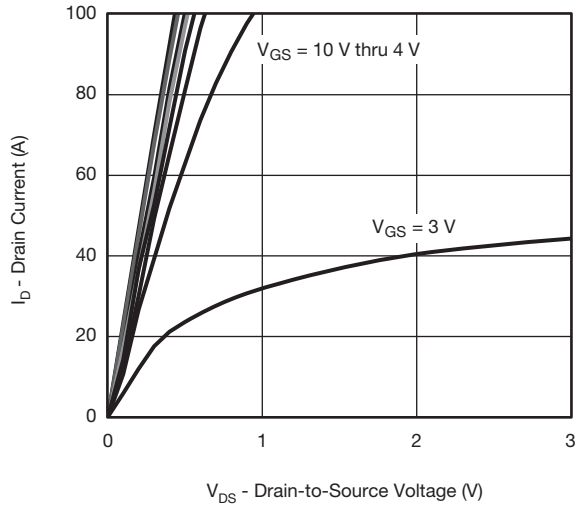
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 30			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		- 23		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		5			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1.0		- 2.2	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}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			- 10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -10\text{ V}$	- 20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		0.0045	0.0055	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		0.0063	0.0078	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$		71		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		6200		pF
Output Capacitance	C_{oss}		615			
Reverse Transfer Capacitance	C_{rss}		560			
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		106	160	nC
		$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		51	77	
Q_{gs}	17					
Q_{gd}	16.5					
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.9	4.6	9.2	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 1.5\text{ }\Omega$ $I_D \cong -10\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ }\Omega$		60	90	ns
Rise Time	t_r		50	75		
Turn-Off Delay Time	$t_{d(off)}$		80	120		
Fall Time	t_f		40	60		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 1.5\text{ }\Omega$ $I_D \cong -10\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		15	25	
Rise Time	t_r		10	15		
Turn-Off Delay Time	$t_{d(off)}$		115	175		
Fall Time	t_f		40	60		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			- 38	A
Pulse Diode Forward Current ^a	I_{SM}				- 100	
Body Diode Voltage	V_{SD}	$I_S = -10\text{ A}$		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -10\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		35	55	ns
Body Diode Reverse Recovery Charge	Q_{rr}		30	45	nC	
Reverse Recovery Fall Time	t_a		15		ns	
Reverse Recovery Rise Time	t_b		20			

Notes:

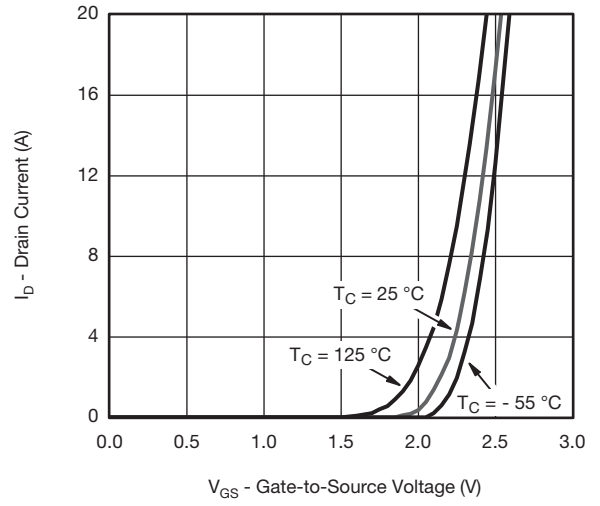
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing.

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.

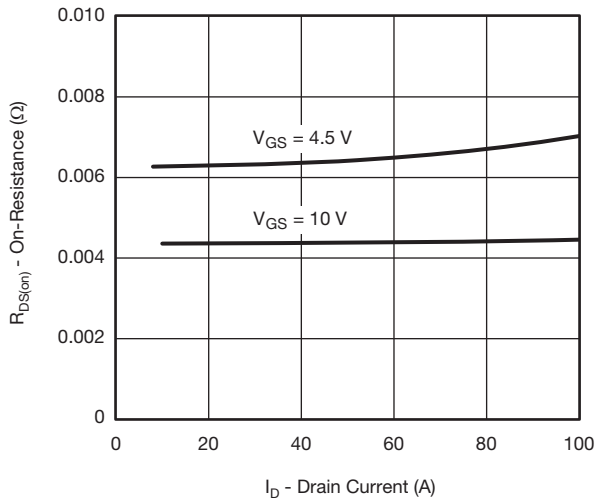
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



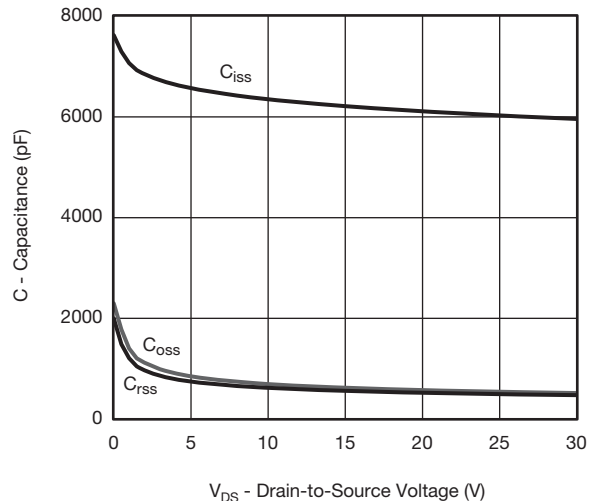
Output Characteristics



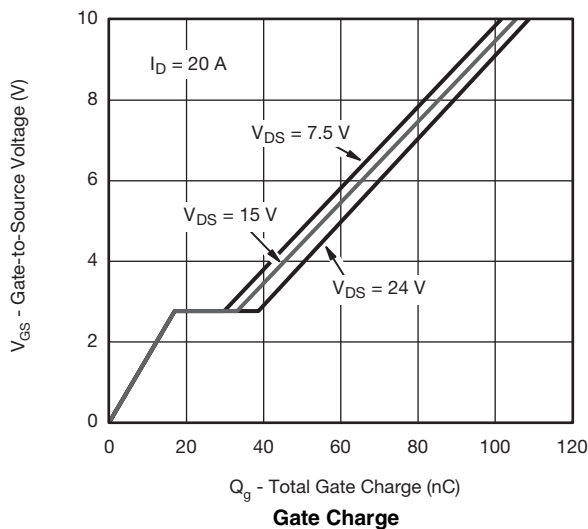
Transfer Characteristics



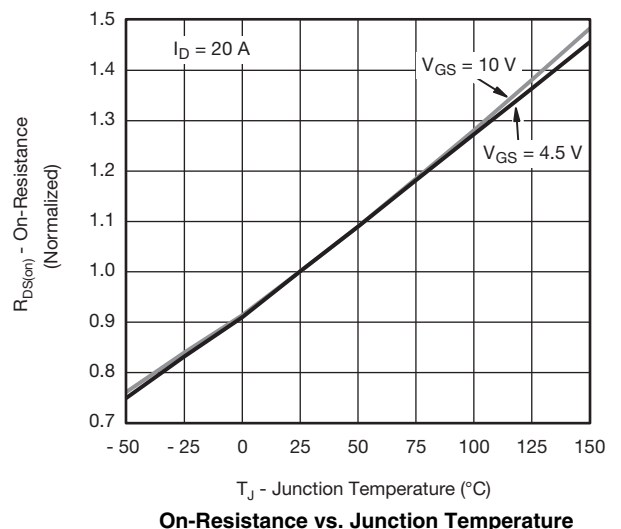
On-Resistance vs. Drain Current and Gate Voltage



Capacitance



Gate Charge



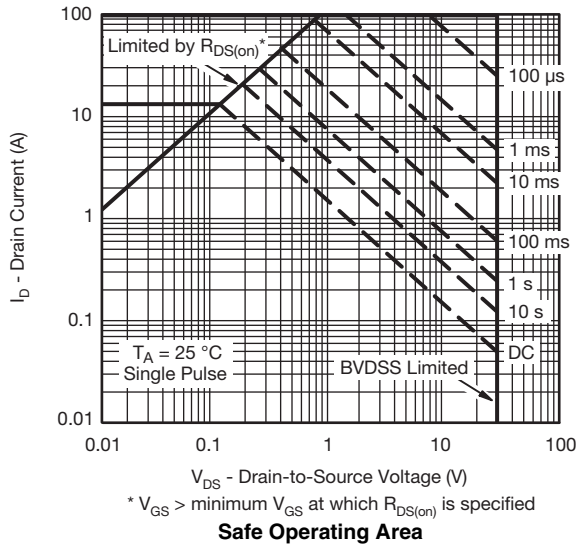
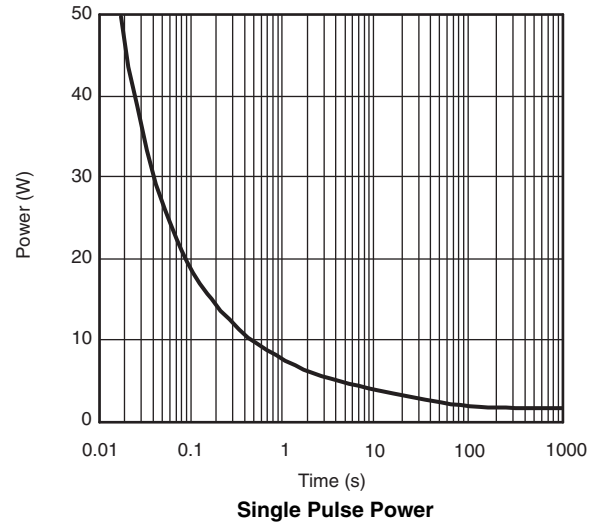
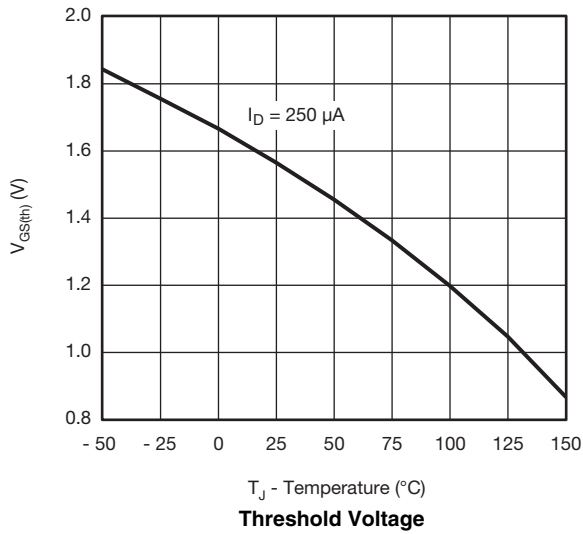
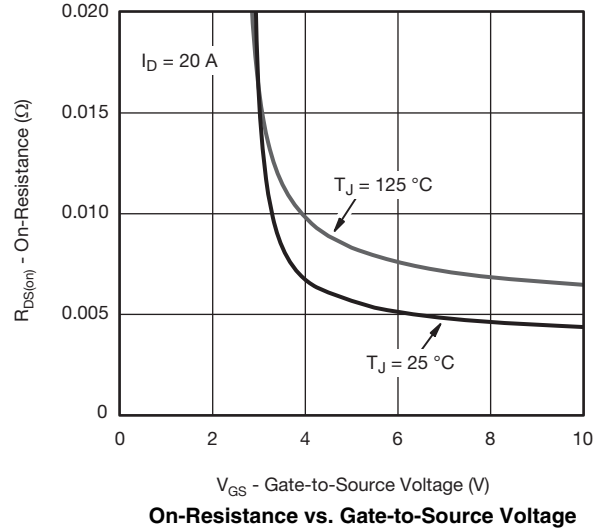
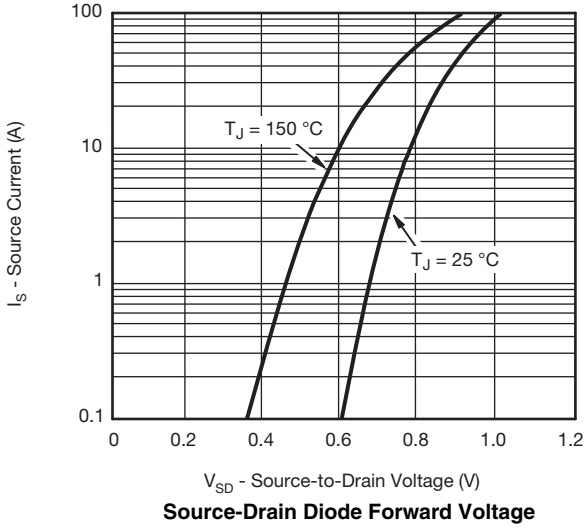
On-Resistance vs. Junction Temperature

Si7997DP

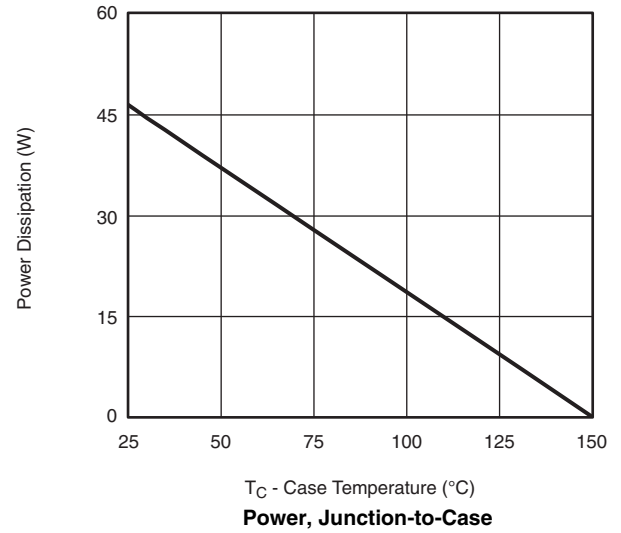
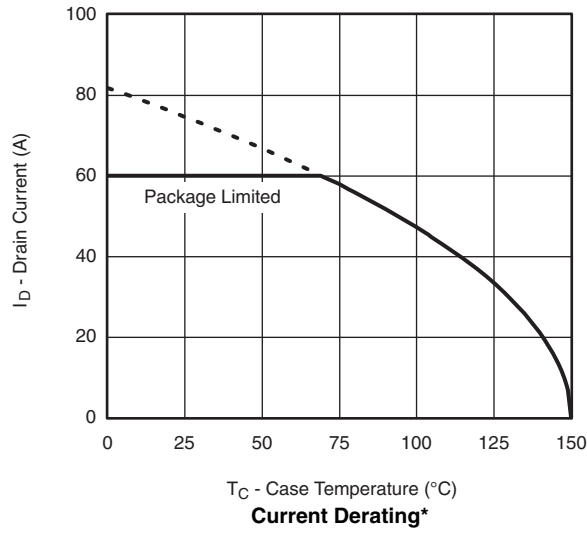


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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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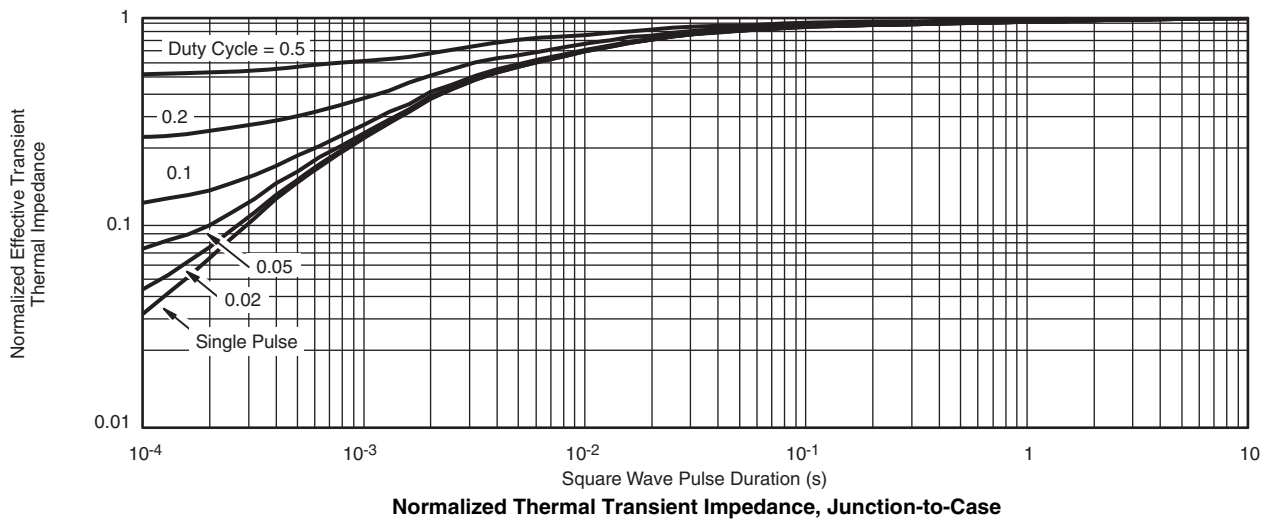
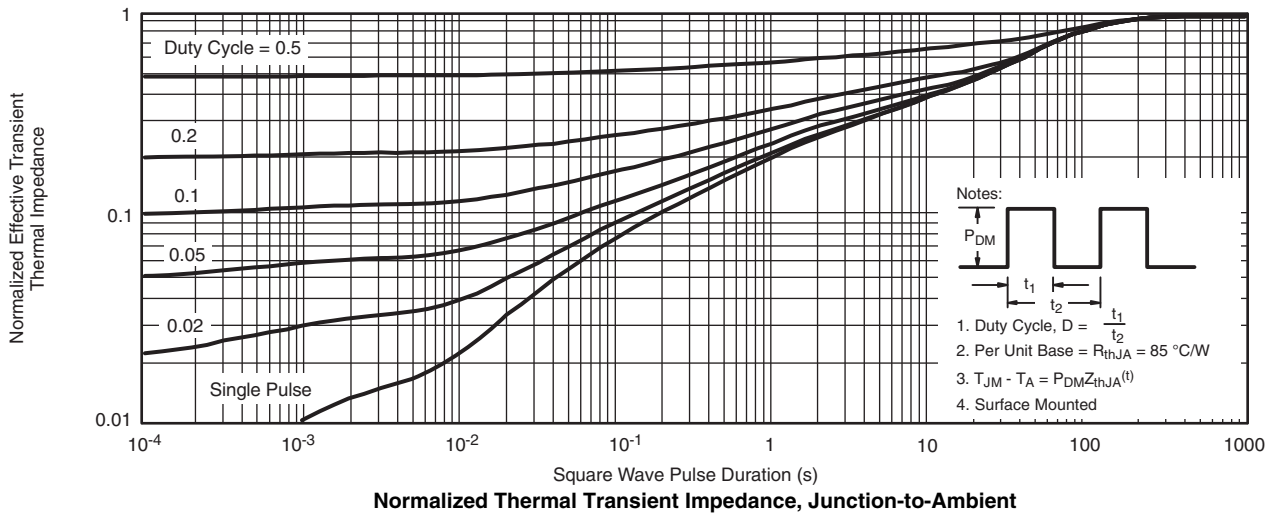
* The power dissipation P_D is based on $T_{J(max)} = 150\text{ °C}$, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package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

Si7997DP



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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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