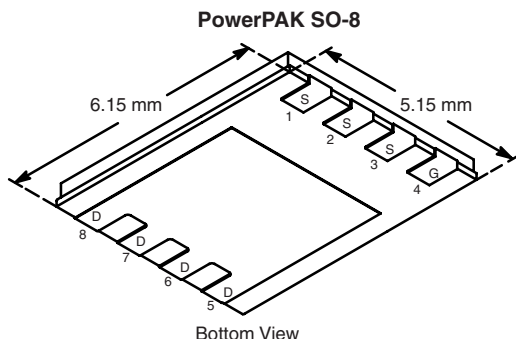




P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 30	0.0026 at $V_{GS} = -10$ V	- 60 ^d	129 nC
	0.00375 at $V_{GS} = -4.5$ V	- 60 ^d	



Bottom View

FEATURES

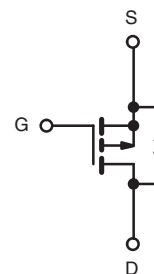
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Adaptor Switch
- Notebook Computers



P-Channel MOSFET

Ordering Information: Si7145DP-T1-GE3 (Lead (Pb)-free and Halogen-free)

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)	T _C = 25 °C	I _D	- 60 ^d	A	
	T _C = 70 °C		- 60 ^d		
	T _A = 25 °C		- 36.5 ^{a, b}		
	T _A = 70 °C		- 29.2 ^{a, b}		
Pulsed Drain Current		I _{DM}	- 100		
Continuous Source-Drain Diode Current	T _C = 25 °C	I _S	- 60 ^d		
	T _A = 25 °C		- 5.6 ^{a, b}		
Avalanche Current	L = 0.1 mH	I _{AS}	- 50		
Single-Pulse Avalanche Energy		E _{AS}	125	mJ	
Maximum Power Dissipation	T _C = 25 °C	P _D	104	W	
	T _C = 70 °C		66.6		
	T _A = 25 °C		6.25 ^{a, b}		
	T _A = 70 °C		4.0 ^{a, b}		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150	°C	
Soldering Recommendations (Peak Temperature) ^{e, f}			260		

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{a, c}	R_{thJA}	15	20	°C/W
Maximum Junction-to-Case	R_{thJC}	0.9	1.2	

Notes:

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

b. $t = 10$ s.

c. Maximum under Steady State conditions is 54 °C/W.

d. Package limited.

e. See Solder Profile (www.vishay.com/doc?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.

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

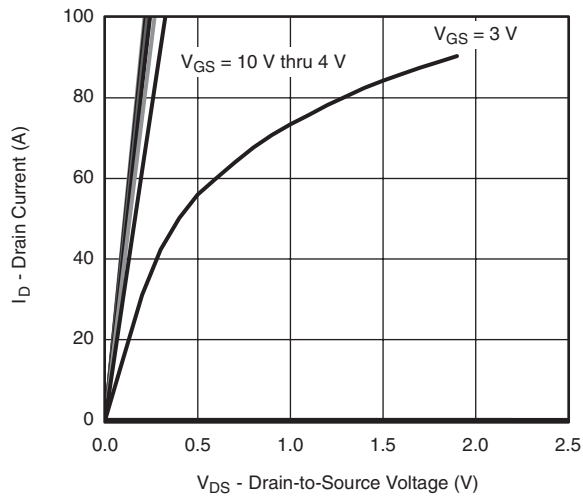
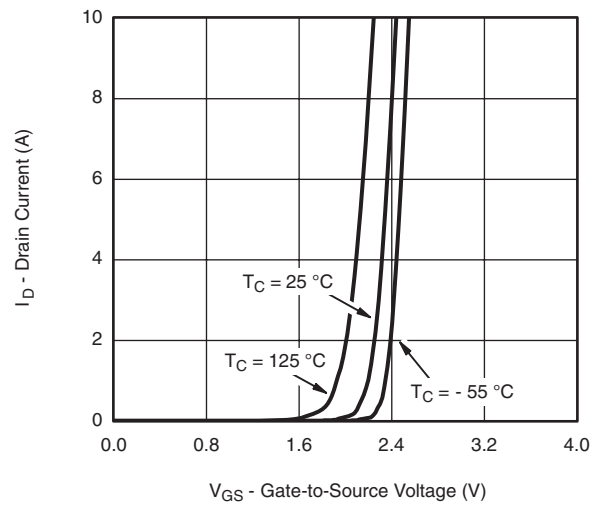
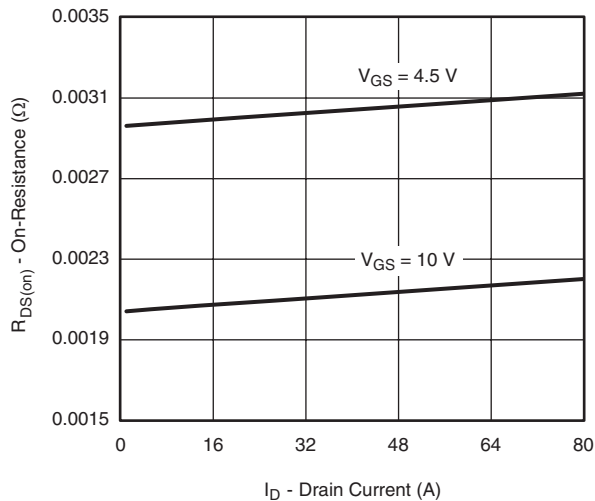
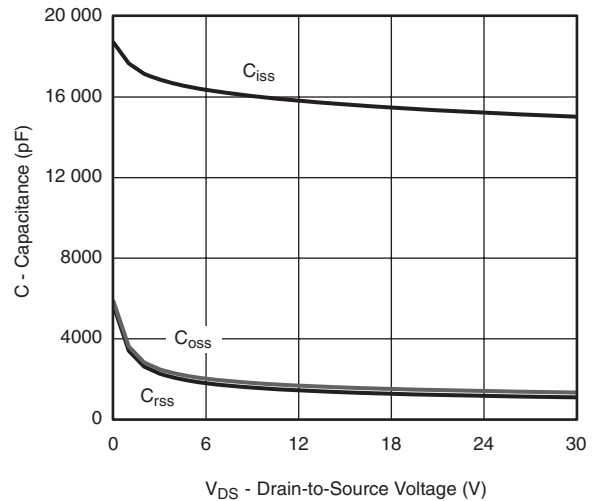
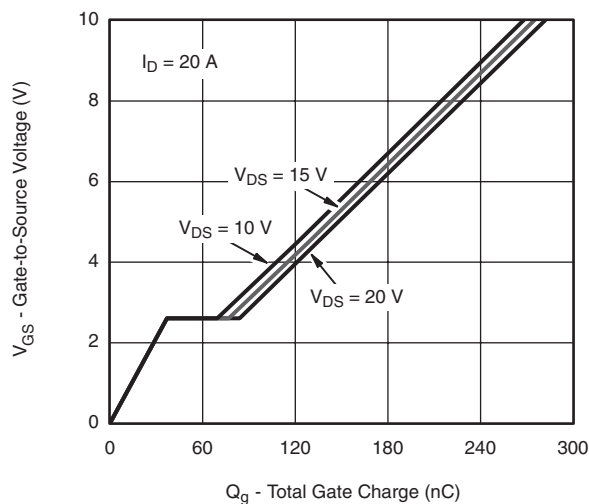
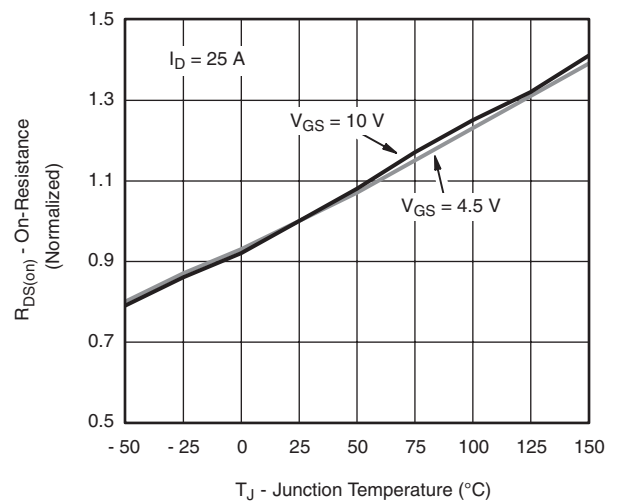
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 30			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 18		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			5.1		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 1.0		- 2.3	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	- 40			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 10 V, I _D = - 25 A		0.0021	0.0026	Ω
		V _{GS} = - 4.5 V, I _D = - 20 A		0.0030	0.00375	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 10 V, I _D = - 25 A		110		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 15 V, V _{GS} = 0 V, f = 1 MHz		15 660		pF
Output Capacitance	C _{oss}			1335		
Reverse Transfer Capacitance	C _{rss}			1570		
Total Gate Charge	Q _g	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 20 A		275	413	nC
		V _{DS} = - 15 V, V _{GS} = - 4.5 V, I _D = - 20 A		129	194	
Gate-Source Charge	Q _{gs}			37		
Gate-Drain Charge	Q _{gd}			40		
Gate Resistance	R _g	f = 1 MHz	0.4	1.6	3.2	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		27	50	ns
Rise Time	t _r			13	26	
Turn-Off DelayTime	t _{d(off)}			130	220	
Fall Time	t _f			27	50	
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		125	210	
Rise Time	t _r			110	190	
Turn-Off DelayTime	t _{d(off)}			107	180	
Fall Time	t _f			43	80	
Drain-Source Body Diode Characteristics						
Continous Source-Drain Diode Current	I _S	T _C = 25 °C			- 60	A
Pulse Diode Forward Current	I _{SM}				- 100	
Body Diode Voltage	V _{SD}	I _S = - 5 A, V _{GS} = 0 V		- 0.69	- 1.1	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 10 A, dI/dt = 100 A/μs, T _J = 25 °C		42	80	ns
Body Diode Reverse Recovery Charge	Q _{rr}			44	84	nC
Reverse Recovery Fall Time	t _a			20		ns
Reverse Recovery Rise Time	t _b			22		

Notes:

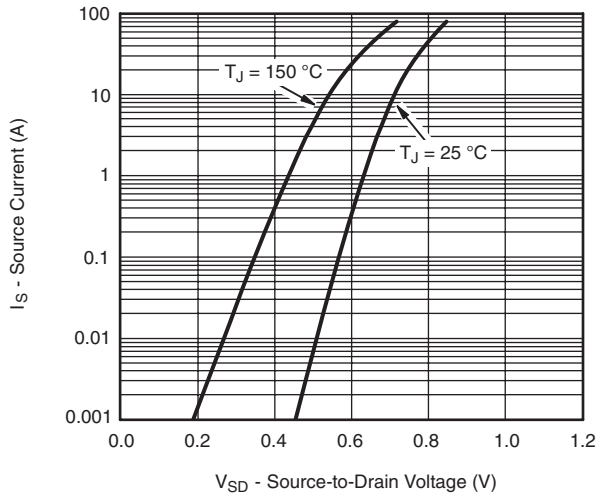
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

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.

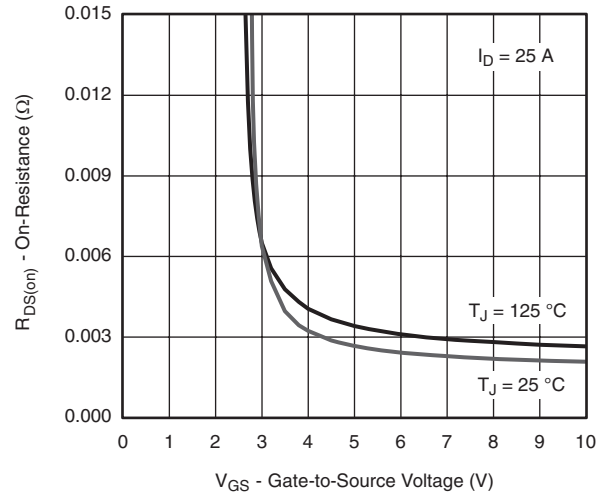

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

Capacitance

Gate Charge

On-Resistance vs. Junction Temperature

Si7145DP

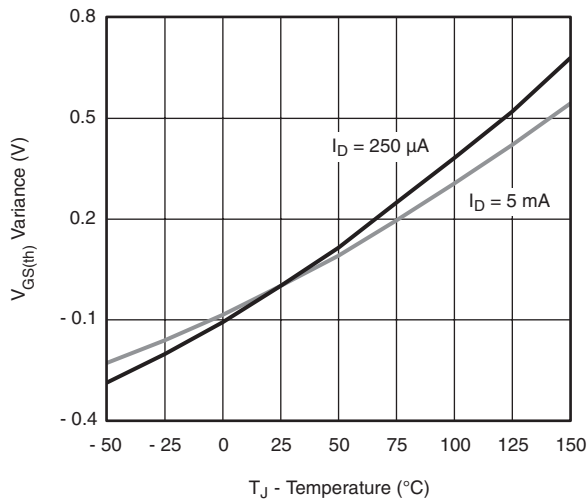
Vishay Siliconix

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

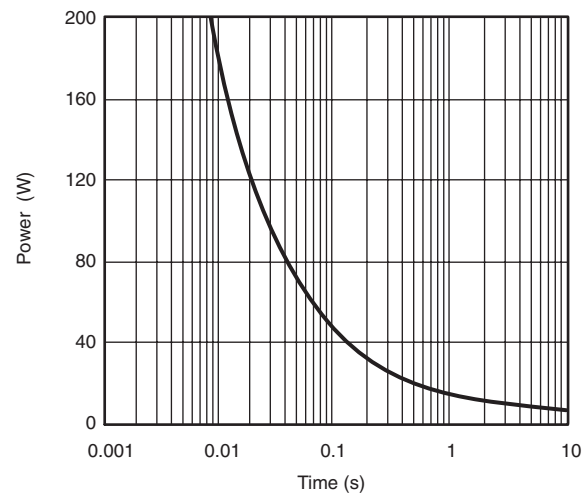
Source-Drain Diode Forward Voltage



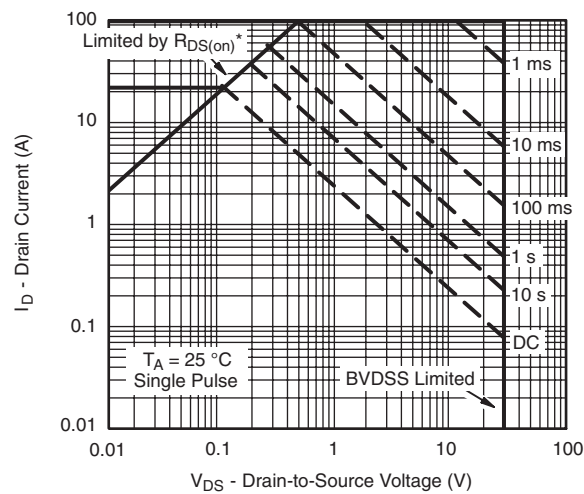
On-Resistance vs. Gate-to-Source Voltage



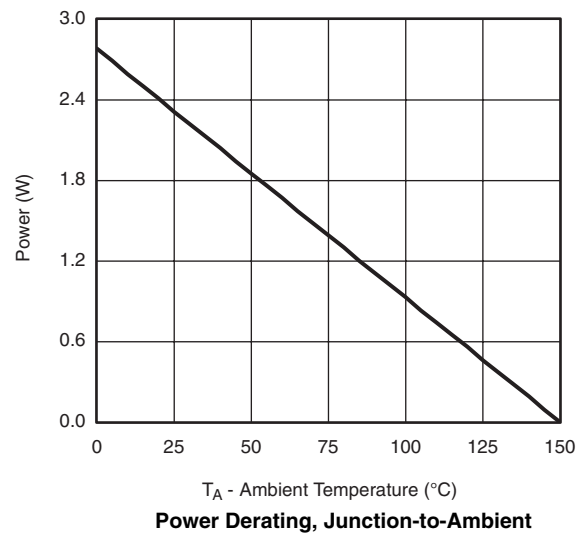
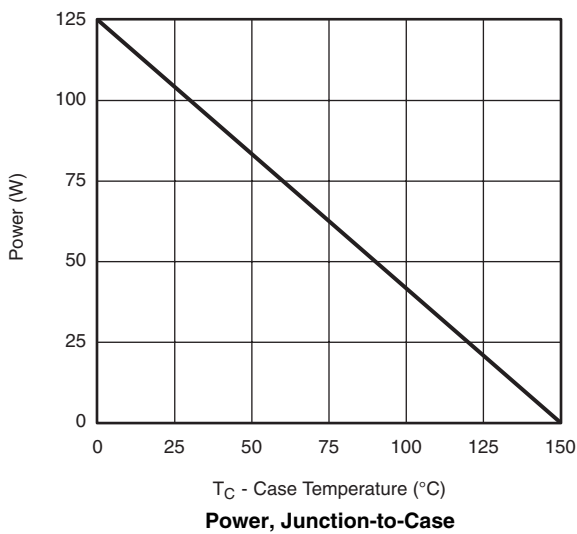
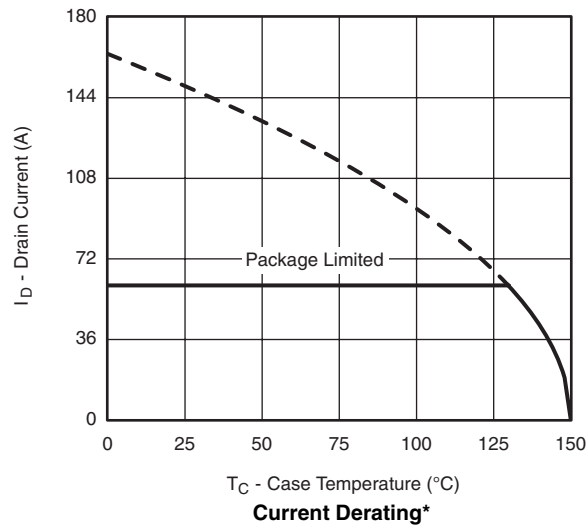
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

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

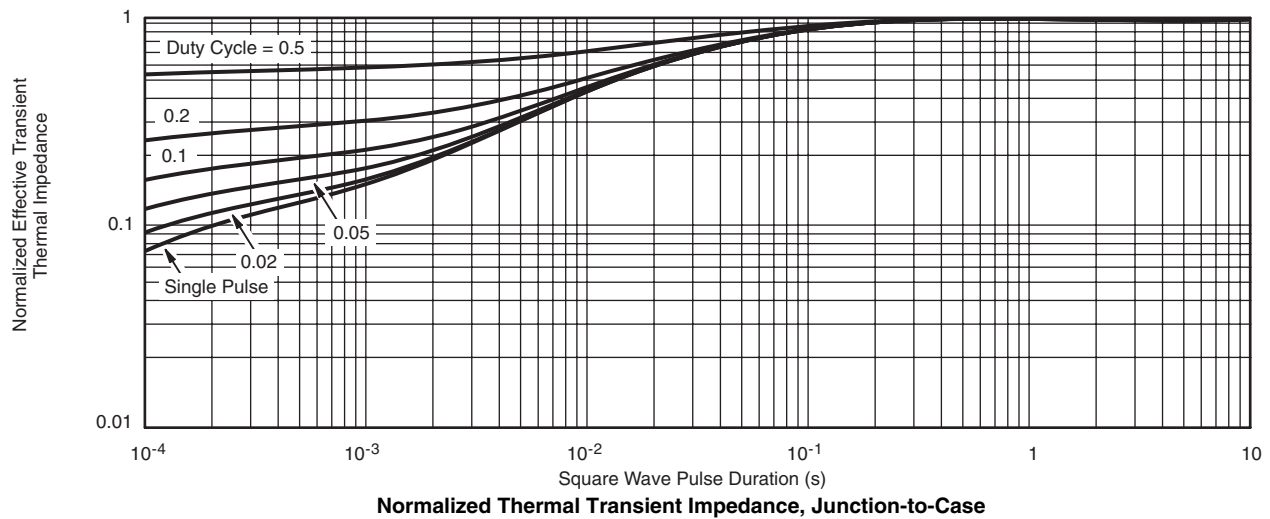
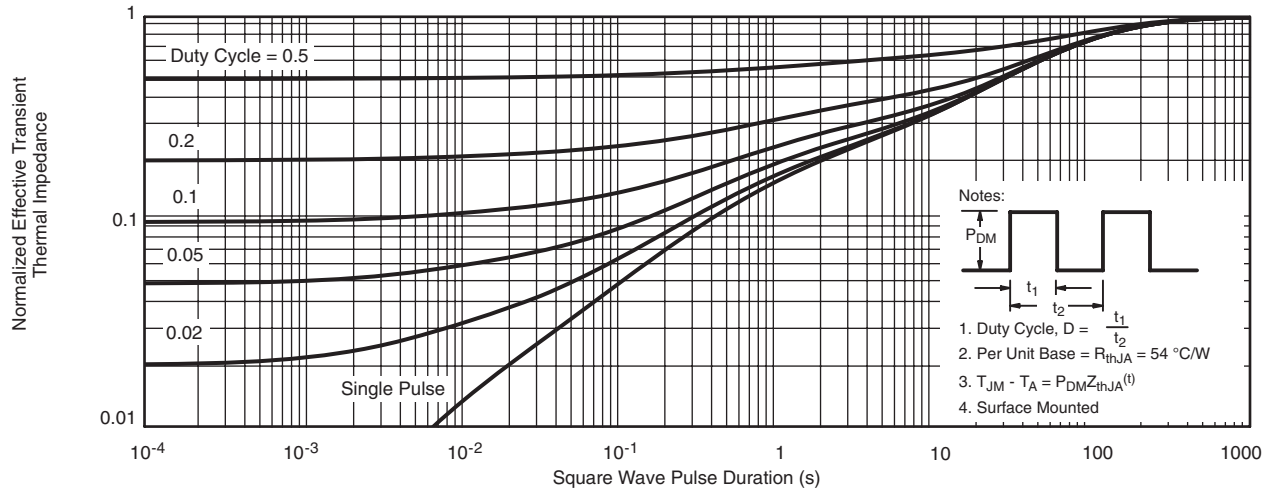
Safe Operating Area


MOSFET 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.

Si7145DP

Vishay Siliconix

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

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?64814.

PowerPAK® SO-8, (Single/Dual)



DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.97	1.04	1.12	0.038	0.041	0.044
A1		-	0.05	0	-	0.002
b	0.33	0.41	0.51	0.013	0.016	0.020
c	0.23	0.28	0.33	0.009	0.011	0.013
D	5.05	5.15	5.26	0.199	0.203	0.207
D1	4.80	4.90	5.00	0.189	0.193	0.197
D2	3.56	3.76	3.91	0.140	0.148	0.154
D3	1.32	1.50	1.68	0.052	0.059	0.066
D4	0.57 typ.			0.0225 typ.		
D5	3.98 typ.			0.157 typ.		
E	6.05	6.15	6.25	0.238	0.242	0.246
E1	5.79	5.89	5.99	0.228	0.232	0.236
E2 (for AL product)	3.30	3.48	3.66	0.130	0.137	0.144
E2 (for other product)	3.48	3.66	3.84	0.137	0.144	0.151
E3	3.68	3.78	3.91	0.145	0.149	0.154
E4 (for AL product)	0.58 typ.			0.023 typ.		
E4 (for other product)	0.75 typ.			0.030 typ.		
e	1.27 BSC			0.050 BSC		
K (for AL product)	1.45 typ.			0.057 typ.		
K (for other product)	1.27 typ.			0.050 typ.		
K1	0.56	-	-	0.022	-	-
H	0.51	0.61	0.71	0.020	0.024	0.028
L	0.51	0.61	0.71	0.020	0.024	0.028
L1	0.06	0.13	0.20	0.002	0.005	0.008
θ	0°	-	12°	0°	-	12°
W	0.15	0.25	0.36	0.006	0.010	0.014
M	0.125 typ.			0.005 typ.		
ECN: C13-0702-Rev. K, 20-May-13						
DWG: 5881						

RECOMMENDED MINIMUM PADS FOR PowerPAK® SO-8 Single



Recommended Minimum Pads
Dimensions in Inches/(mm)

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