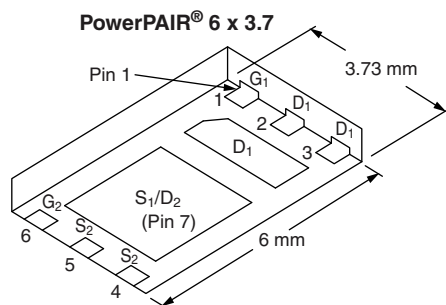


N-Channel 20-V (D-S) MOSFETs

PRODUCT SUMMARY

	V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)
Channel-1	20	0.0087 at V _{GS} = 10 V	16 ^a	7.3 nC
		0.0115 at V _{GS} = 4.5 V	16 ^a	
Channel-2	20	0.0062 at V _{GS} = 10 V	16 ^a	21 nC
		0.0080 at V _{GS} = 4.5 V	16 ^a	



Ordering Information:
SiZ720DT-T1-GE3 (Lead (Pb)-free and Halogen-free)

FEATURES

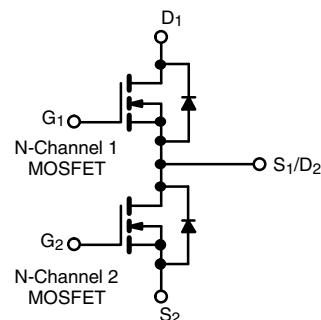
- Halogen-free According to IEC 61249-2-21 Definition
- TrenchFET[®] Power MOSFETs
- 100 % R_g and UIS Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Notebook System Power
- POL
- Low Current DC/DC



ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C, unless otherwise noted)

Parameter	Symbol	Channel-1	Channel-2	Unit
Drain-Source Voltage	V _{DS}	20		V
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	T _C = 25 °C	16 ^a		A
	T _C = 70 °C	16 ^a		
	T _A = 25 °C	16 ^{a, b, c}		
	T _A = 70 °C	16 ^{a, b, c}		
Pulsed Drain Current	I _{DM}	70	70	
Source Drain Current Diode Current	T _C = 25 °C	16 ^a	16 ^a	
	T _A = 25 °C	3.2 ^{b, c}	3.8 ^{b, c}	
Single Pulse Avalanche Current	L = 0.1 mH	18	20	
Single Pulse Avalanche Energy	E _{AS}	16	20	mJ
Maximum Power Dissipation	T _C = 25 °C	27	48	W
	T _C = 70 °C	17	31	
	T _A = 25 °C	3.9 ^{b, c}	4.6 ^{b, c}	
	T _A = 70 °C	2.5 ^{b, c}	3 ^{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	Channel-1		Channel-2		Unit
			Typ.	Max.	Typ.	Max.	
Maximum Junction-to-Ambient ^{b, f}	t ≤ 10 s	R _{thJA}	24	32	20	27	°C/W
Maximum Junction-to-Case (Drain)	Steady State	R _{thJC}	3.5	4.6	2	2.6	

Notes:

- Package limited.
- Surface mounted on 1" x 1" FR4 board.
- t = 10 s.
- See solder profile (www.vishay.com/doc?73257). The PowerPAIR 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 67 °C/W for channel-1 and 65 °C/W for channel-2.

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	Ch-1	20			V	
		V _{GS} = 0 V, I _D = 250 μA	Ch-2	20				
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA	Ch-1		21		mV/°C	
		I _D = 250 μA	Ch-2		20			
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J	I _D = 250 μA	Ch-1		- 5.2			
		I _D = 250 μA	Ch-2		- 5.5			
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	Ch-1	1		2	V	
		V _{DS} = V _{GS} , I _D = 250 μA	Ch-2	1		2		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V	Ch-1			± 100	nA	
			Ch-2			± 100		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V	Ch-1			1	μA	
		V _{DS} = 20 V, V _{GS} = 0 V	Ch-2			1		
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55 °C	Ch-1			5		
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55 °C	Ch-2			5		
On-State Drain Current ^b	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	Ch-1	20			A	
		V _{DS} ≥ 5 V, V _{GS} = 10 V	Ch-2	20				
Drain-Source On-State Resistance ^b	R _{DS(on)}	V _{GS} = 10 V, I _D = 16.8 A	Ch-1		0.0070	0.0087	Ω	
		V _{GS} = 10 V, I _D = 20 A	Ch-2		0.0050	0.0062		
		V _{GS} = 4.5 V, I _D = 14.6 A	Ch-1		0.0091	0.0115		
		V _{GS} = 4.5 V, I _D = 20 A	Ch-2		0.0065	0.0080		
Forward Transconductance ^b	g _{fs}	V _{DS} = 10 V, I _D = 16.8 A	Ch-1		60		S	
		V _{DS} = 10 V, I _D = 20 A	Ch-2		60			
Dynamic ^a								
Input Capacitance	C _{iss}	Channel-1 V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	Ch-1		825		pF	
			Ch-2		2350			
Output Capacitance	C _{oss}	Channel-2 V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	Ch-1		295			
			Ch-2		800			
Reverse Transfer Capacitance	C _{rss}	Channel-1 V _{DS} = 10 V, V _{GS} = 0 V, f = 1 MHz	Ch-1		130			
			Ch-2		350			
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 10 V, I _D = 16.8 A	Ch-1		14.8	23	nC	
		V _{DS} = 10 V, V _{GS} = 10 V, I _D = 20 A	Ch-2		44	66		
		Channel-1 V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 16.8 A	Ch-1		7.3	11		
			Ch-2		21	32		
Gate-Source Charge	Q _{gs}	Channel-2 V _{DS} = 10 V, V _{GS} = 4.5 V, I _D = 20 A	Ch-1		2.5			
			Ch-2		6.8			
Gate-Drain Charge	Q _{gd}		Ch-1		2.3			
			Ch-2		5.9			
Gate Resistance	R _g	f = 1 MHz	Ch-1	0.4	2	4	Ω	
			Ch-2	0.3	1.5	3		

Notes:

a. Guaranteed by design, not subject to production testing.

b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.



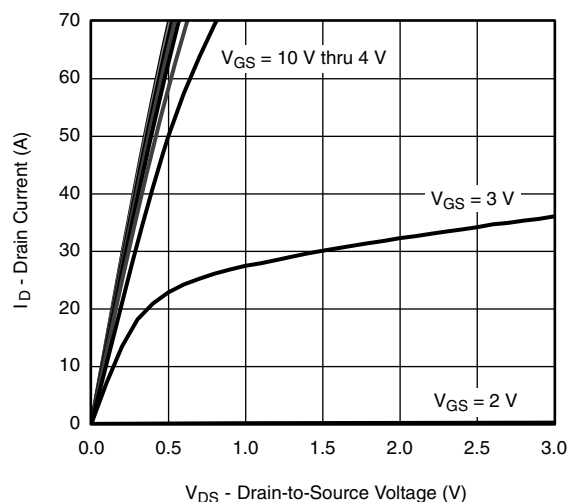
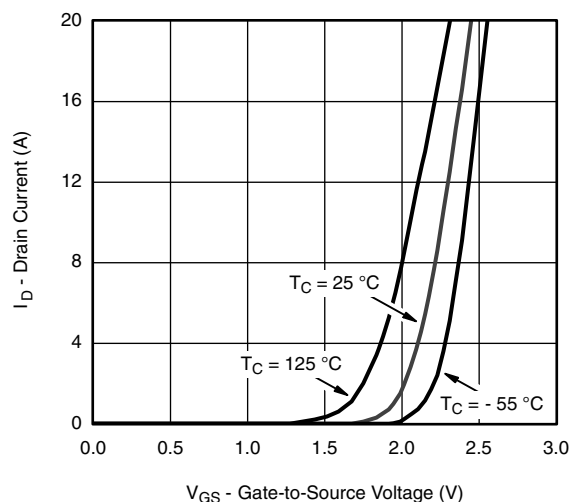
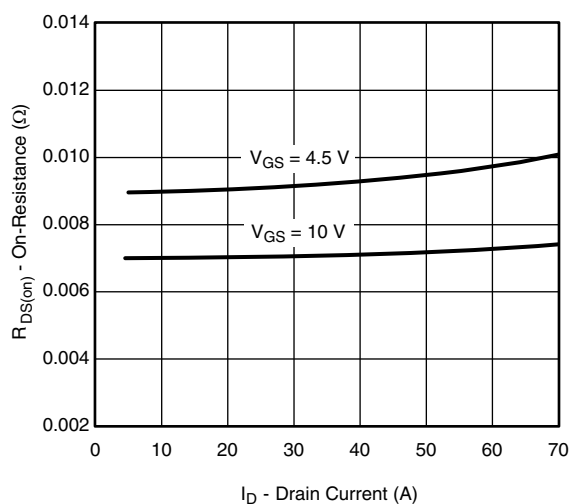
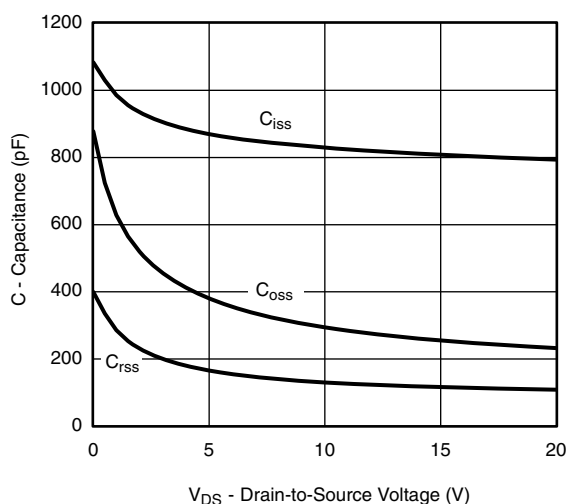
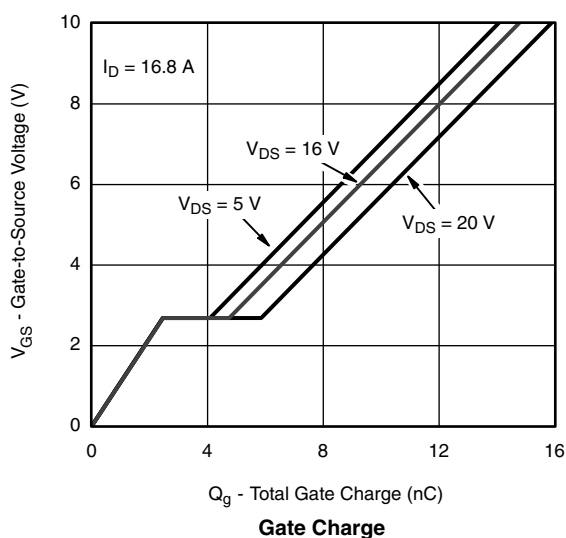
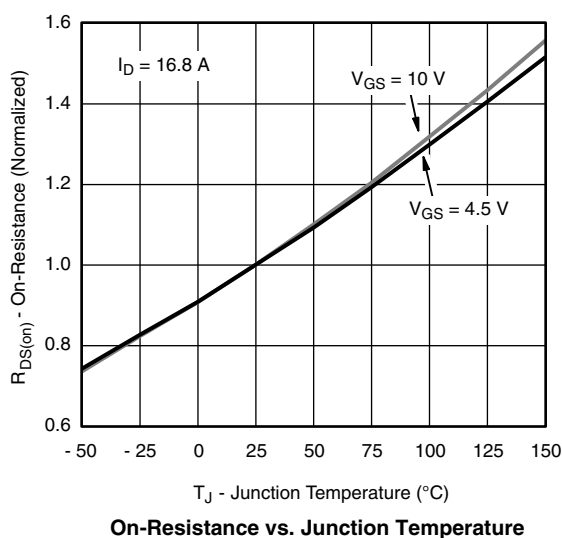
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Dynamic ^a							
Turn-On Delay Time	t _{d(on)}	Channel-1 V _{DD} = 10 V, R _L = 1 Ω I _D ≅ 10 A, V _{GEN} = 4.5 V, R _g = 1 Ω Channel-2 V _{DD} = 10 V, R _L = 1 Ω I _D ≅ 10 A, V _{GEN} = 4.5 V, R _g = 1 Ω	Ch-1		15	25	ns
			Ch-2		25	40	
Rise Time	t _r		Ch-1		15	25	
			Ch-2		17	30	
Turn-Off Delay Time	t _{d(off)}		Ch-1		18	30	
			Ch-2		35	55	
Fall Time	t _f		Ch-1		12	20	
			Ch-2		15	25	
Turn-On Delay Time	t _{d(on)}	Channel-1 V _{DD} = 10 V, R _L = 1 Ω I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω Channel-2 V _{DD} = 10 V, R _L = 1 Ω I _D ≅ 10 A, V _{GEN} = 10 V, R _g = 1 Ω	Ch-1		10	15	
			Ch-2		15	25	
Rise Time	t _r		Ch-1		10	20	
			Ch-2		9	15	
Turn-Off Delay Time	t _{d(off)}		Ch-1		20	30	
			Ch-2		32	50	
Fall Time	t _f		Ch-1		10	20	
			Ch-2		10	15	
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	Ch-1			16	A
			Ch-2			16	
Pulse Diode Forward Current ^a	I _{SM}		Ch-1			70	
			Ch-2			70	
Body Diode Voltage	V _{SD}	I _S = 10 A, V _{GS} = 0 V	Ch-1		0.8	1.2	V
		I _S = 10 A, V _{GS} = 0 V	Ch-2		0.78	1.2	
Body Diode Reverse Recovery Time	t _{rr}	Channel-1 I _F = 10 A, dI/dt = 100 A/μs, T _J = 25 °C Channel-2 I _F = 10 A, dI/dt = 100 A/μs, T _J = 25 °C	Ch-1		10	20	ns
			Ch-2		22	40	
Body Diode Reverse Recovery Charge	Q _{rr}		Ch-1		2.5	5	nC
			Ch-2		11	20	
Reverse Recovery Fall Time	t _a		Ch-1		5.5		ns
			Ch-2		11		
Reverse Recovery Rise Time	t _b		Ch-1		4.5		
			Ch-2		11		

Notes:

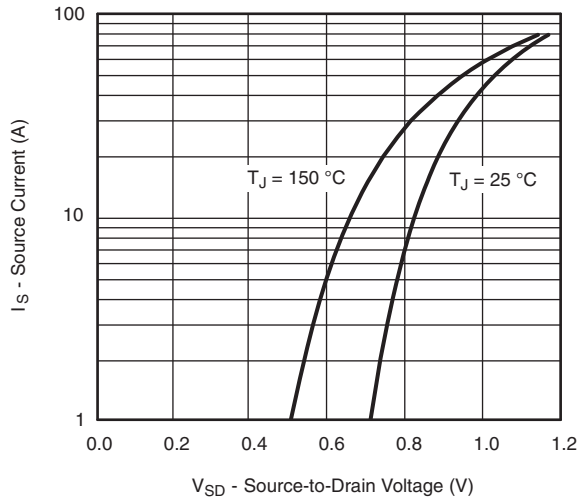
a. Guaranteed by design, not subject to production testing.

b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

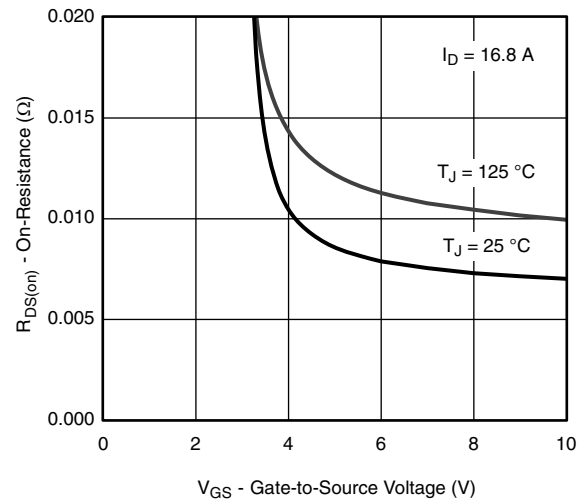
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Capacitance****Gate Charge****On-Resistance vs. Junction Temperature**

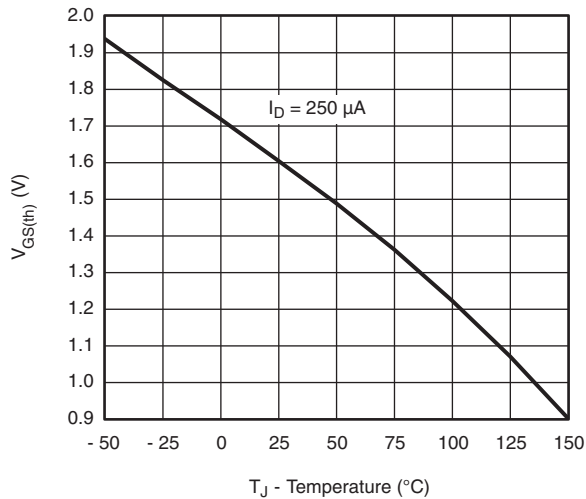
CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



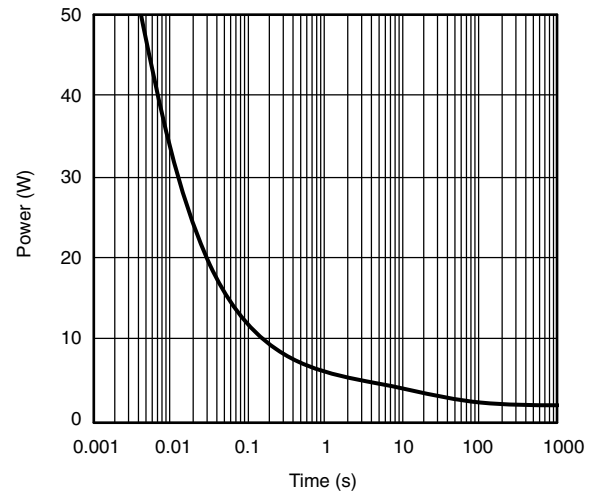
Source-Drain Diode Forward Voltage



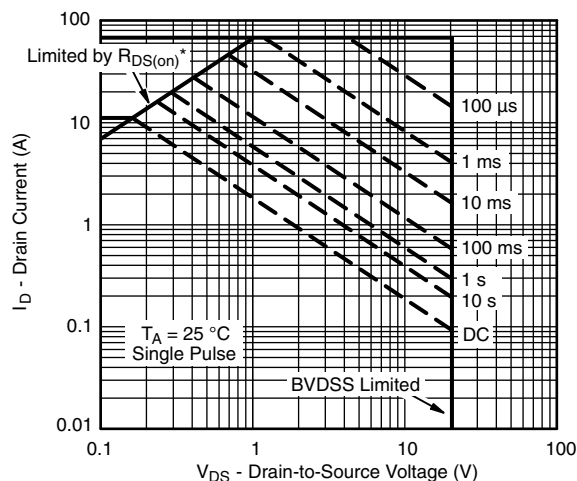
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

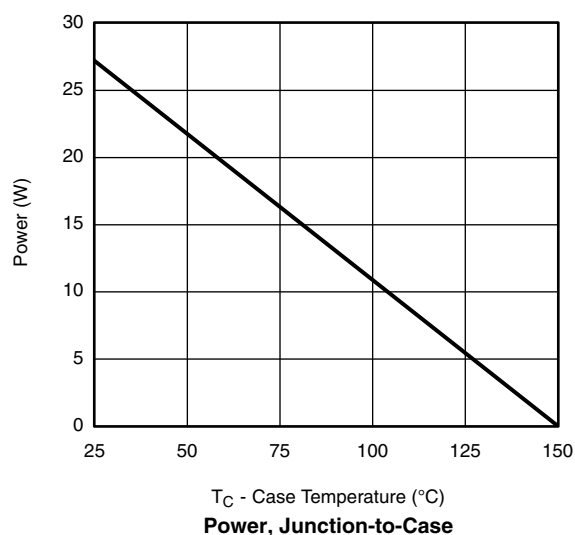
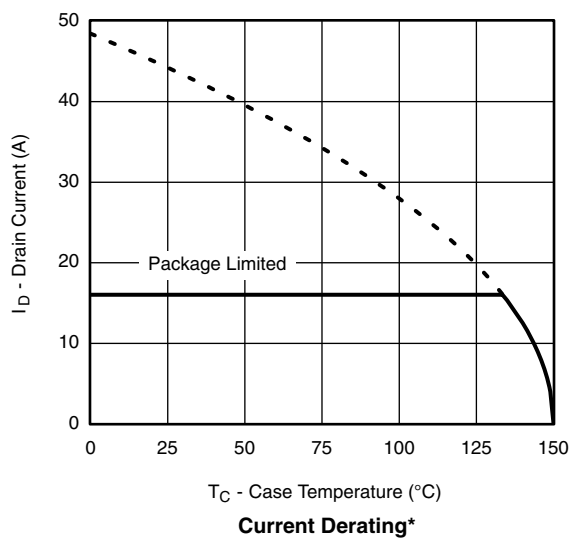


Single Pulse Power



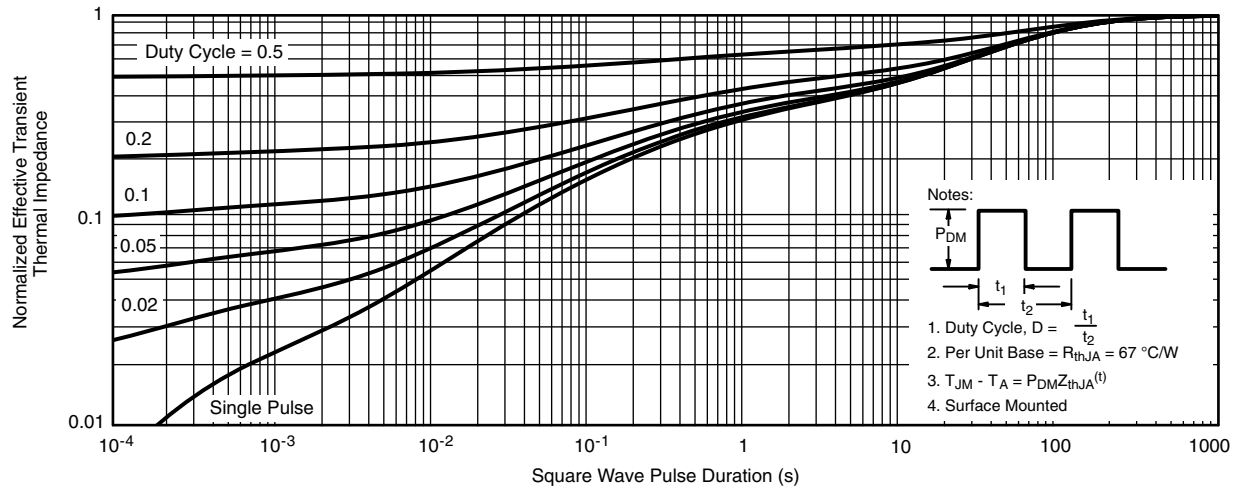
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

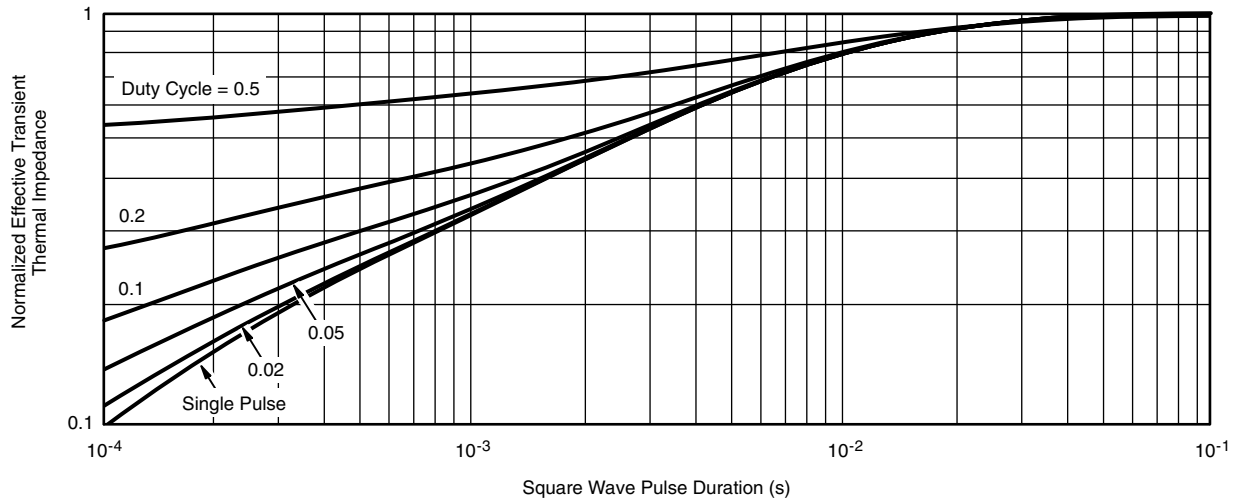
CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

* 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.

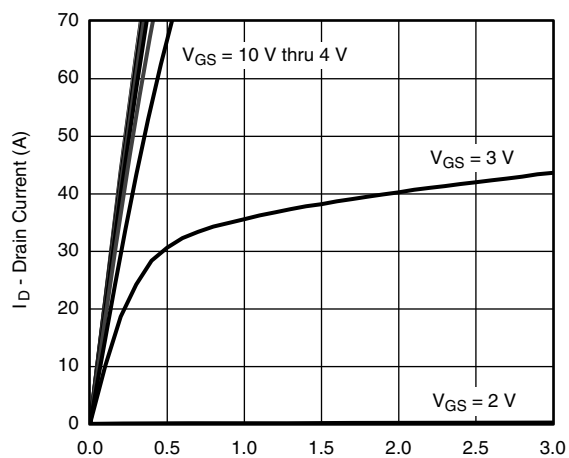
CHANNEL-1 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



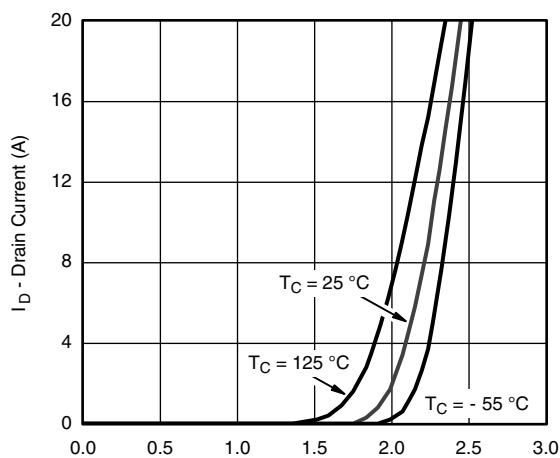
Normalized Thermal Transient Impedance, Junction-to-Ambient



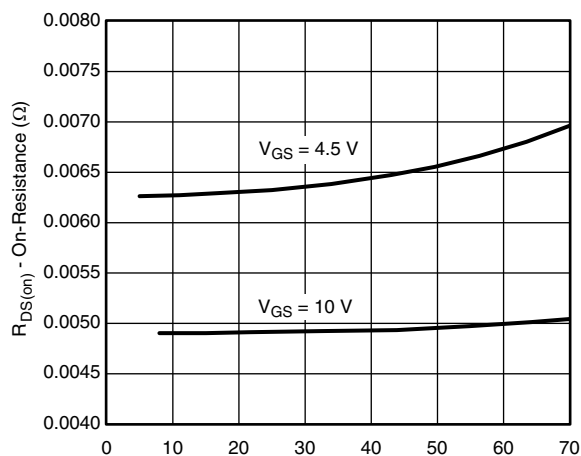
Normalized Thermal Transient Impedance, Junction-to-Case

CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

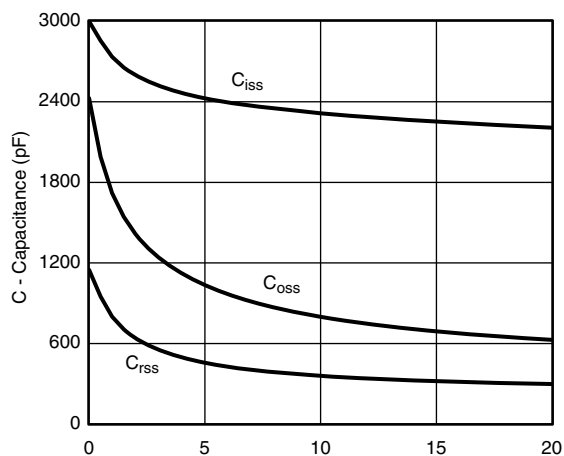
Output Characteristics



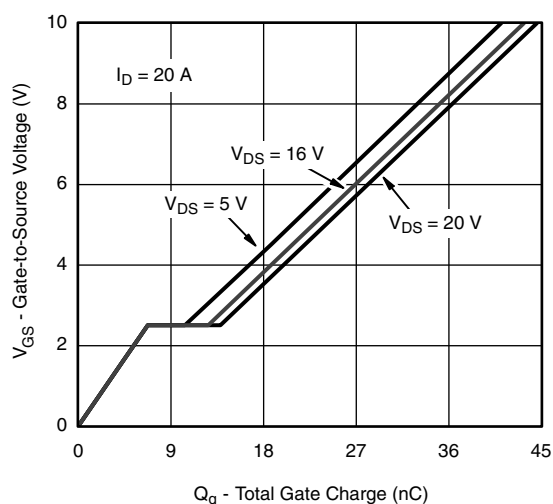
Transfer Characteristics



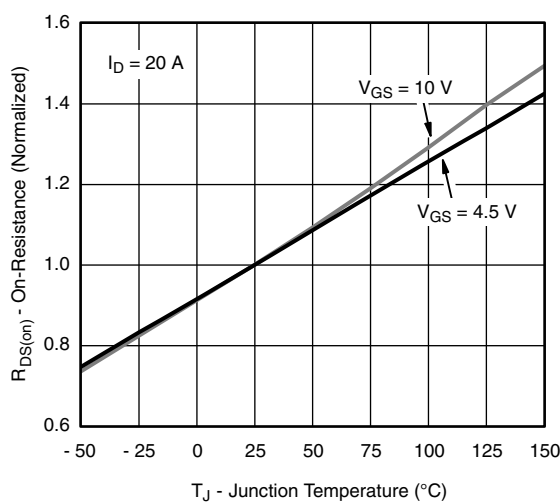
On-Resistance vs. Drain Current



Capacitance

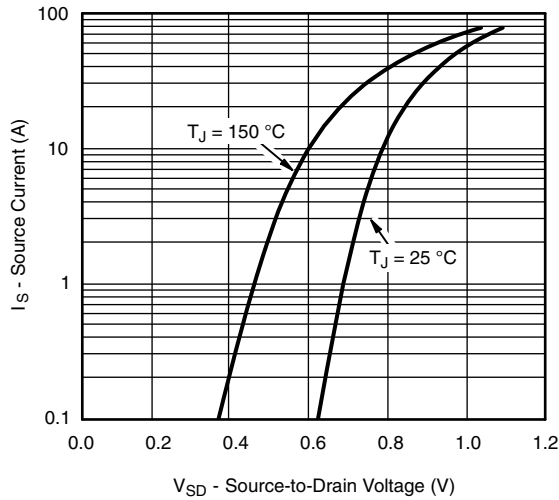


Gate Charge

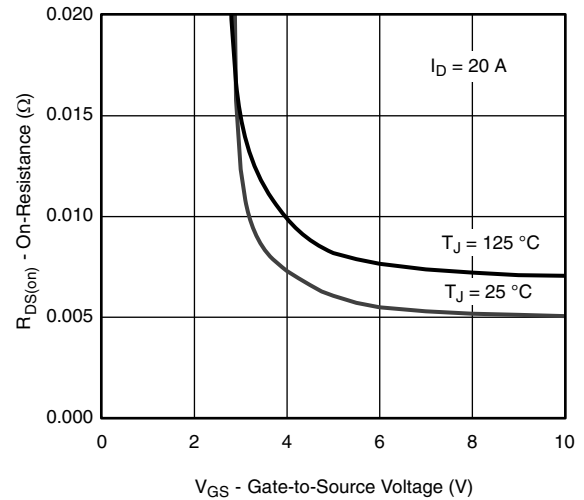


On-Resistance vs. Junction Temperature

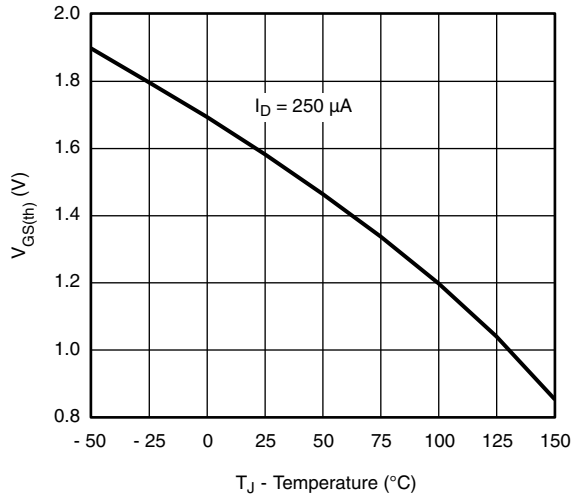
CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



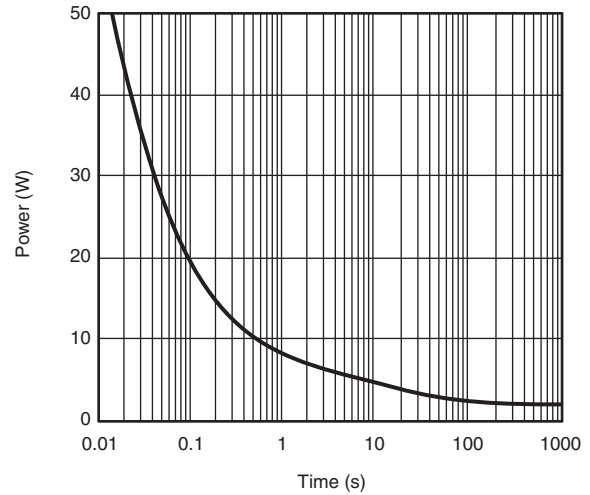
Source-Drain Diode Forward Voltage



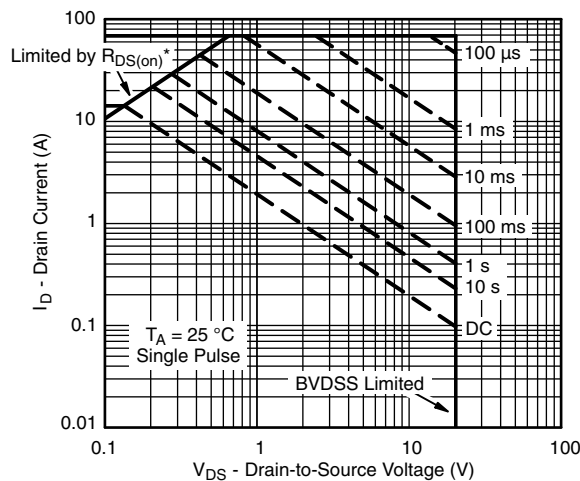
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

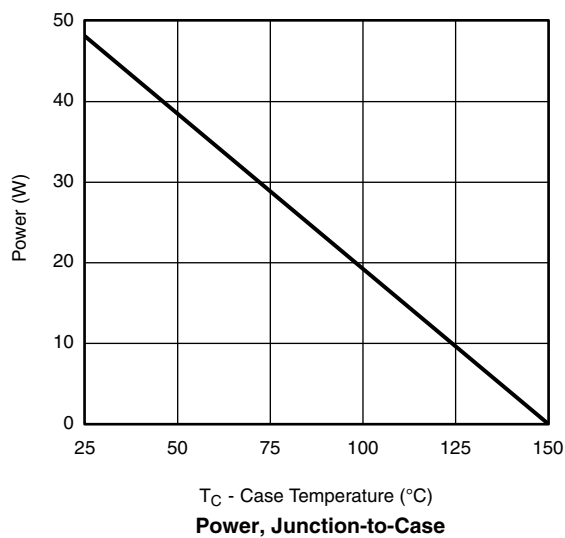
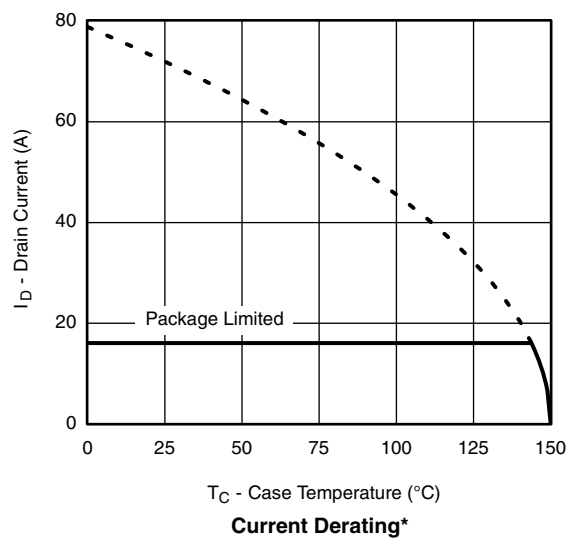


Single Pulse Power



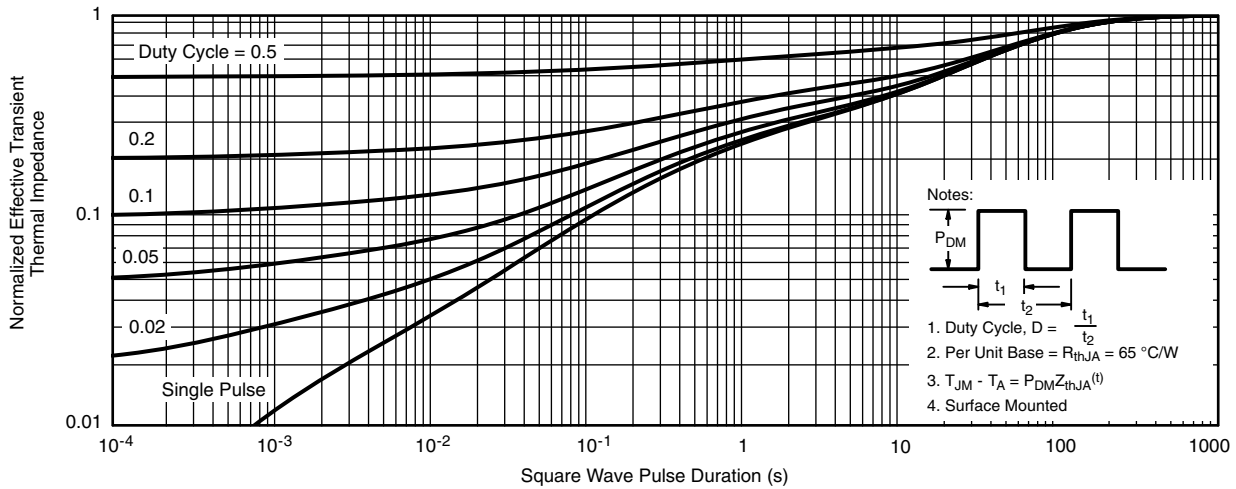
* $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient

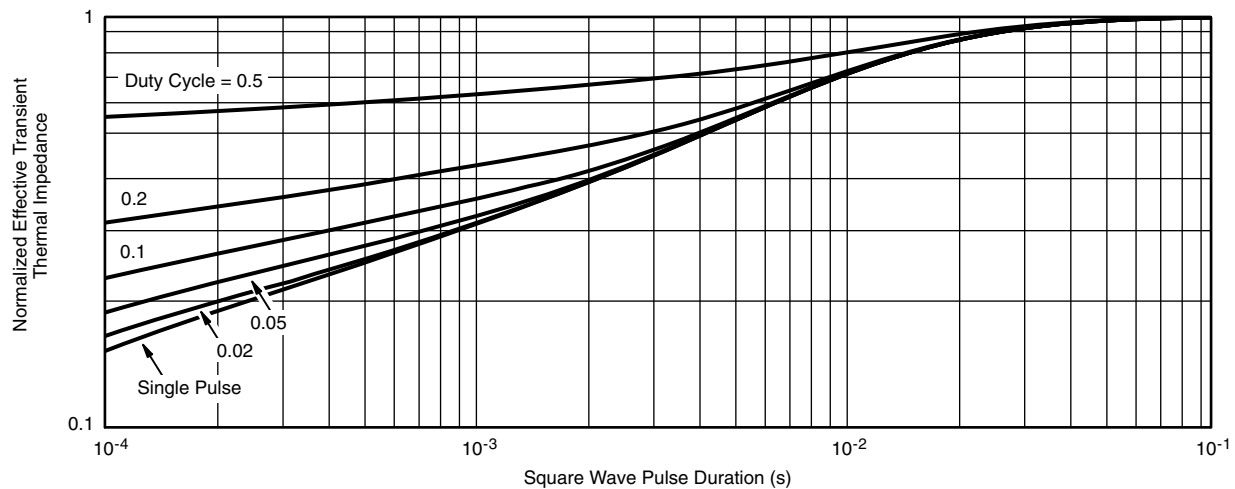
CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


* 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.

CHANNEL-2 TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



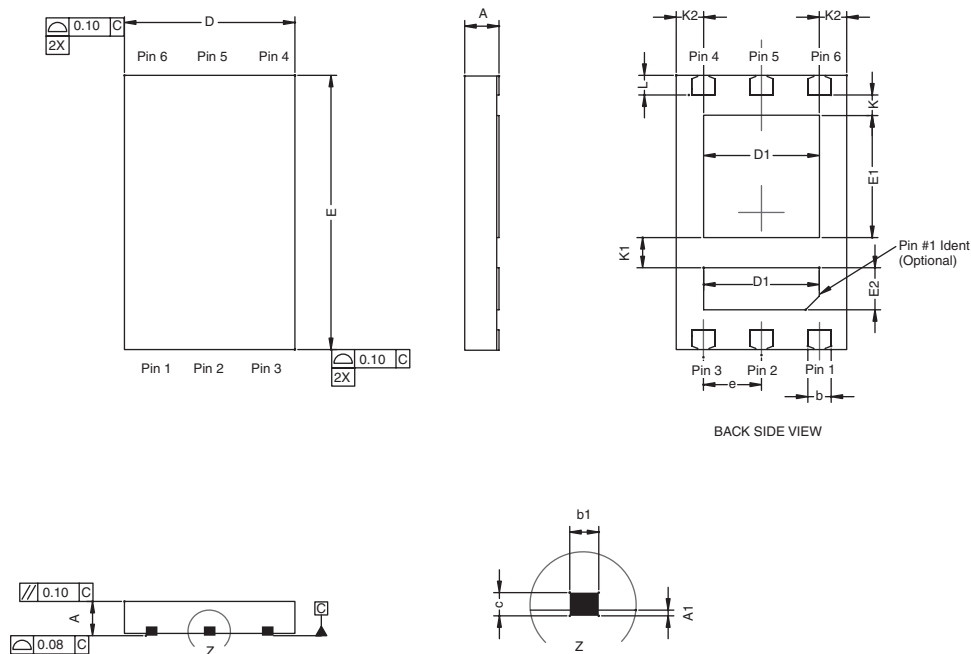
Normalized Thermal Transient Impedance, Junction-to-Ambient



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?65579.

PowerPAIR™ 6 x 3.7 CASE OUTLINE



DIM.	MILLIMETERS			INCHES		
	MIN.	NOM.	MAX.	MIN.	NOM.	MAX.
A	0.70	0.75	0.80	0.028	0.030	0.032
A1	0.00	-	0.05	0.000	-	0.002
b	0.46	0.51	0.56	0.018	0.020	0.022
b1	0.20	0.25	0.38	0.008	0.010	0.015
C	0.18	0.20	0.23	0.007	0.008	0.009
D	3.65	3.73	3.81	0.144	0.147	0.150
D1	2.41	2.53	2.65	0.095	0.100	0.104
E	5.92	6.00	6.08	0.233	0.236	0.239
E1	2.62	2.67	2.72	0.103	0.105	0.107
E2	0.87	0.92	0.97	0.034	0.036	0.038
e	1.27 BSC			0.05 BSC		
K	0.45 TYP.			0.018 TYP.		
K1	0.66 TYP.			0.026 TYP.		
K2	0.60 TYP.			0.024 TYP.		
L	0.38	0.43	0.48	0.015	0.017	0.019
ECN: S-82772-Rev. B, 17-Nov-08 DWG: 5979						

Technical drawing of a mechanical part, showing dimensions in inches and millimeters. The drawing includes a central rectangular feature with a width of 0.1040 (2.642) and a height of 0.1070 (2.718). The central feature has a center point labeled 0, 0.03. The overall width of the part is 0.3520 (8.941). The overall height is 0.4390 (11.151). The drawing also shows several smaller rectangular features and their dimensions, including a top feature with a width of 0.0220 (0.559) and a height of 0.0190 (0.483), and a bottom feature with a width of 0.0500 (1.27) and a height of 0.0380 (0.965). The drawing is labeled with a large '1' in the bottom left corner.

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1



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Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.

Данный компонент на территории Российской Федерации

Вы можете приобрести в компании MosChip.

Для оперативного оформления запроса Вам необходимо перейти по данной ссылке:

<http://moschip.ru/get-element>

Вы можете разместить у нас заказ для любого Вашего проекта, будь то серийное производство или разработка единичного прибора.

В нашем ассортименте представлены ведущие мировые производители активных и пассивных электронных компонентов.

Нашей специализацией является поставка электронной компонентной базы двойного назначения, продукции таких производителей как XILINX, Intel (ex.ALTERA), Vicor, Microchip, Texas Instruments, Analog Devices, Mini-Circuits, Amphenol, Glenair.

Сотрудничество с глобальными дистрибьюторами электронных компонентов, предоставляет возможность заказывать и получать с международных складов практически любой перечень компонентов в оптимальные для Вас сроки.

На всех этапах разработки и производства наши партнеры могут получить квалифицированную поддержку опытных инженеров.

Система менеджмента качества компании отвечает требованиям в соответствии с ГОСТ Р ИСО 9001, ГОСТ РВ 0015-002 и ЭС РД 009

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