

Dual N-Channel 2.5-V (G-S) Input Protected Load Switch

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
20	0.030 at $V_{GS} = 4.5$ V	4.5	7.6
	0.033 at $V_{GS} = 3.0$ V	4.2	
	0.035 at $V_{GS} = 2.5$ V	3.9	

FEATURES

- Halogen-free
- Low $R_{DS(on)}$
- V_{GS} Max Rating: 14 V
- Exceeds 2 kV ESD Protection


RoHS
COMPLIANT

DESCRIPTION

The Si6926AEDQ is a dual N-Channel MOSFET with ESD protection and gate over-voltage protection circuitry incorporated into the MOSFET. The device is designed for use in Lithium Ion battery pack circuits. The 2-stage input protection circuit is a unique design, consisting of two stages of back-to-back zener diodes separated by a resistor. The first stage diode is designed to absorb most of the ESD energy. The second stage diode is designed to protect the gate from any remaining ESD energy and over-voltages

above the gates inherent safe operating range. The series resistor used to limit the current through the second stage diode during over voltage conditions has a maximum value which limits the input current to ≤ 10 mA at 14 V and the maximum t_{off} to 15 μ s. The Si6926AEDQ has been optimized as a battery or load switch in Lithium Ion applications with the advantage of both a 2.5 V $R_{DS(on)}$ rating and a safe 14 V gate-to-source maximum rating.

APPLICATION CIRCUITS

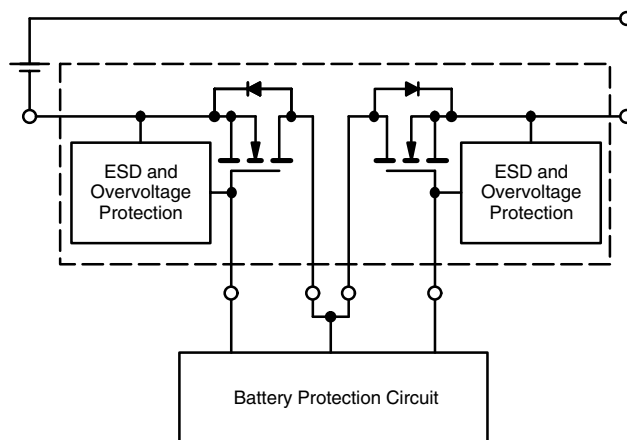
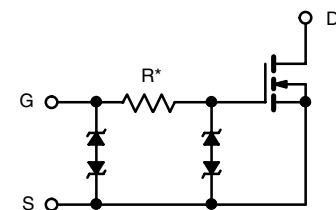


Figure 1. Typical Use In a Lithium Ion Battery Pack

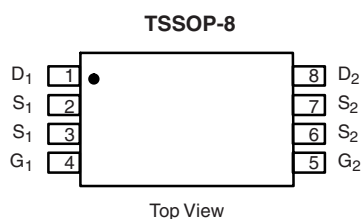


*R typical value is 1.9 k Ω by design.

See Typical Characteristics,
Gate-Current vs. Gate-Source Voltage, Page 3.

Figure 2. Input ESD and Overvoltage Protection Circuit

FUNCTIONAL BLOCK DIAGRAM AND PIN CONFIGURATION



Ordering Information: Si6926AEDQ-T1-GE3 (Lead (Pb)-free and Halogen-free)

Figure 3.

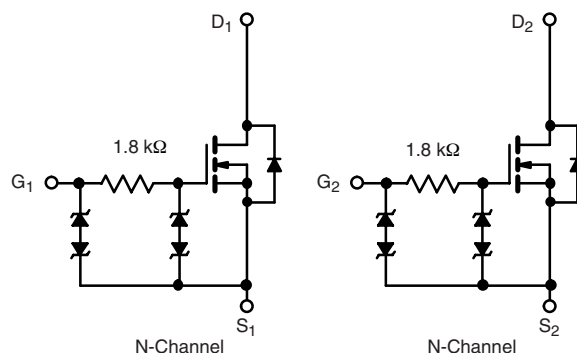


Figure 4.

ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted				
Parameter	Symbol	10 s	Steady State	Unit
Drain-Source Voltage, Source-Drain Voltage	V_{DS}	20		V
Gate-Source Voltage	V_{GS}	± 14		
Continuous Drain-to-Source Current ($T_J = 150\text{ }^{\circ}\text{C}$) ^a	I_D	4.5	4.1	A
		3.6	3.3	
Pulsed Drain-to-Source Current	I_{DM}	20		
Pulsed Source Current (Diode Conduction) ^a	I_S	0.83	0.69	
Maximum Power Dissipation ^a	P_D	1.0	0.83	W
		0.64	0.53	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150		$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10\text{ s}$	R_{thJA}	90	125	$^{\circ}\text{C/W}$
	Steady State		126	150	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	65	80	

Notes:

a. Surface Mounted on FR4 board.

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.4		1.2	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 4.5\text{ V}$			± 1	μA
		$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 12\text{ V}$			± 10	mA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 20\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			5	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 5\text{ V}$	10			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}$, $I_D = 4.5\text{ A}$		0.023	0.030	Ω
		$V_{GS} = 3.0\text{ V}$, $I_D = 4.2\text{ A}$		0.025	0.033	
		$V_{GS} = 2.5\text{ V}$, $I_D = 3.9\text{ A}$		0.027	0.035	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 10\text{ V}$, $I_D = 4.5\text{ A}$		26		S
Diode Forward Voltage ^b	V_{SD}	$I_S = 0.83\text{ A}$, $V_{GS} = 0\text{ V}$		0.65	1.1	V
Dynamic^a						
Total Gate Charge	Q_g	$V_{DS} = 10\text{ V}$, $V_{GS} = 4.5\text{ V}$, $I_D = 4.5\text{ A}$		7.6	12	nC
Gate-Source Charge	Q_{gs}			1.5		
Gate-Drain Charge	Q_{gd}			1.5		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\text{ V}$, $R_L = 10\text{ }\Omega$ $I_D \cong 1\text{ A}$, $V_{GEN} = 4.5\text{ V}$, $R_g = 6\text{ }\Omega$		0.43	0.7	μs
Rise Time	t_r			0.8	1.2	
Turn-Off Delay Time	$t_{d(off)}$			5.0	7.5	
Fall Time	t_f			2.5	4.0	

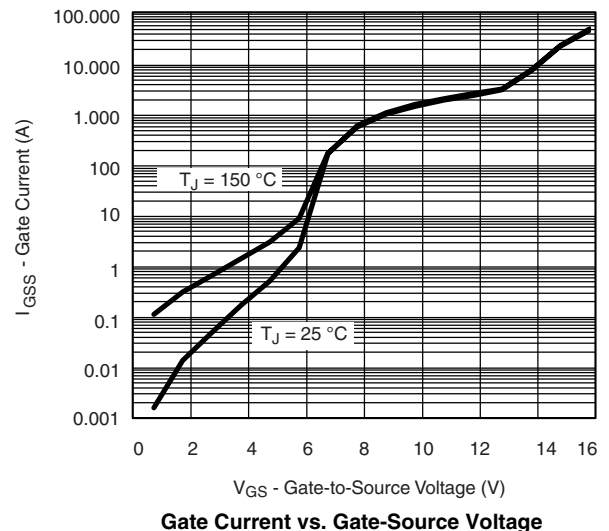
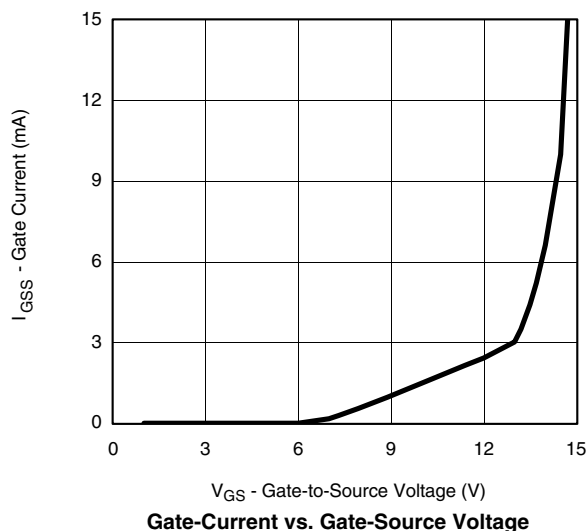
Notes:

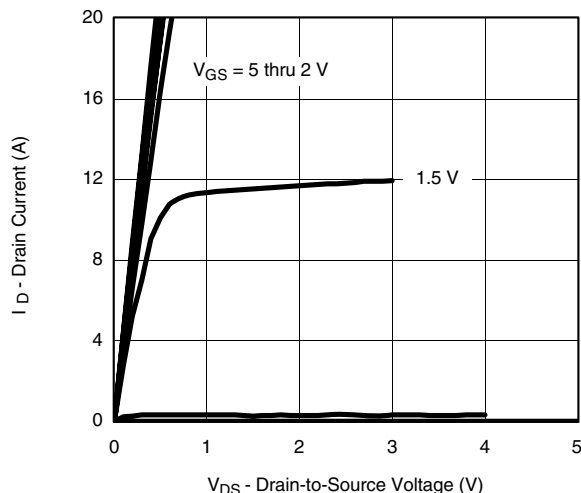
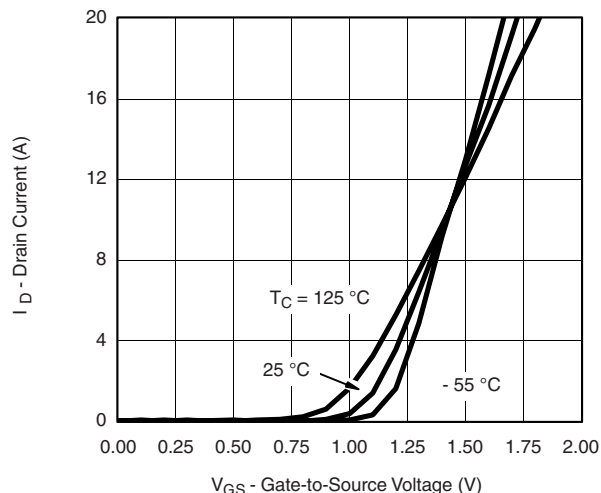
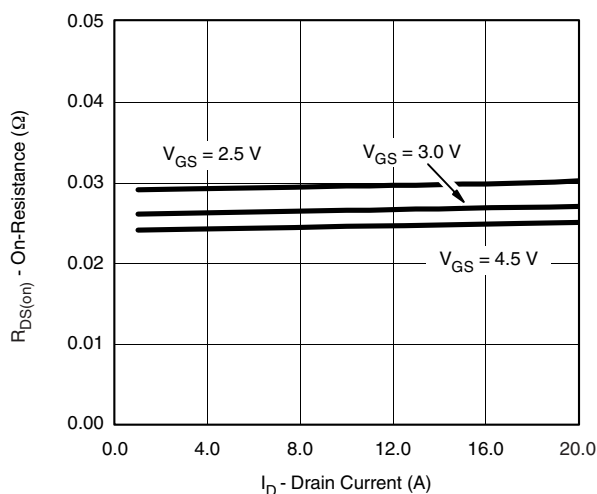
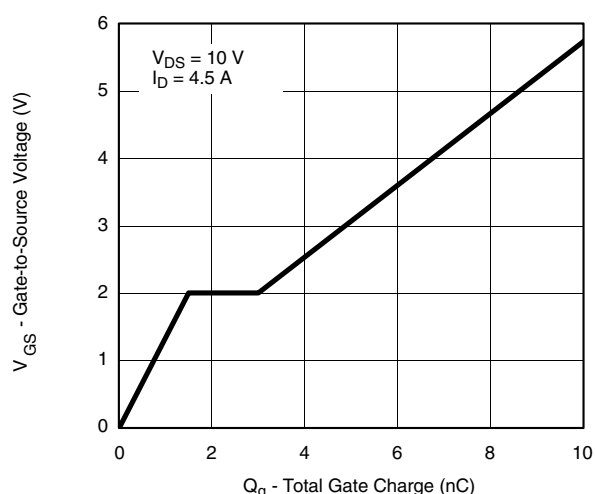
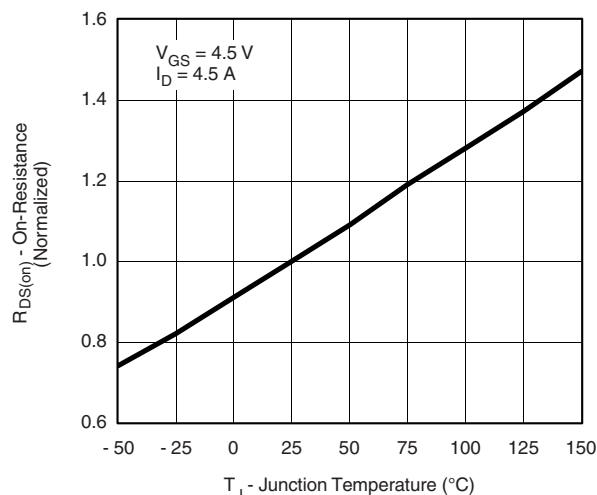
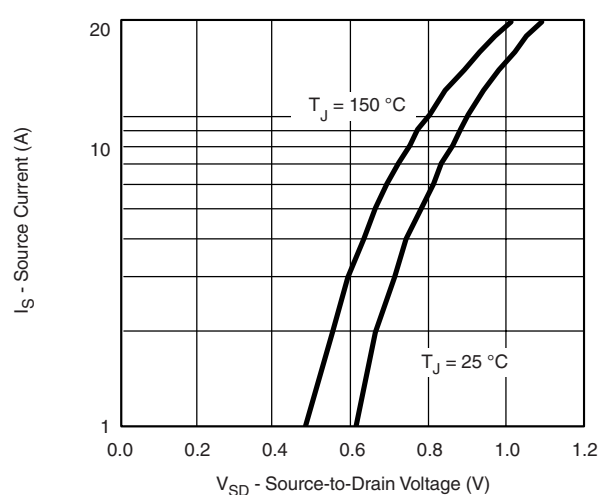
a. Guaranteed by design, not subject to production testing.

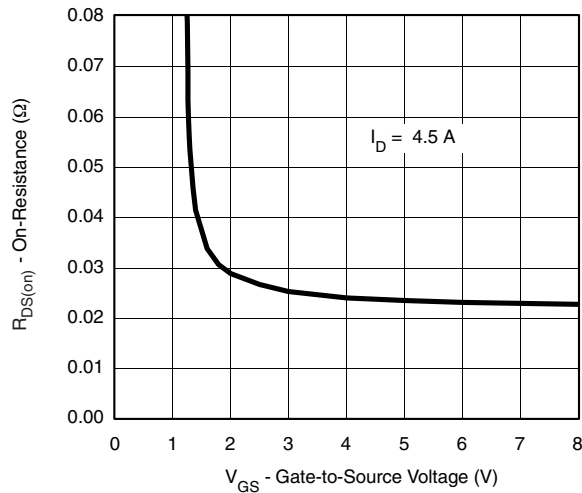
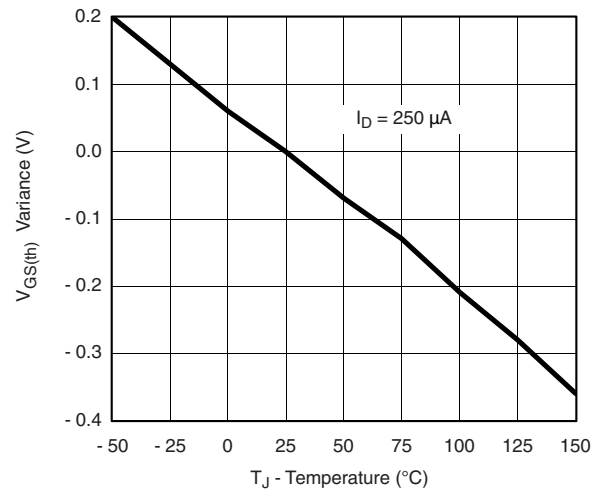
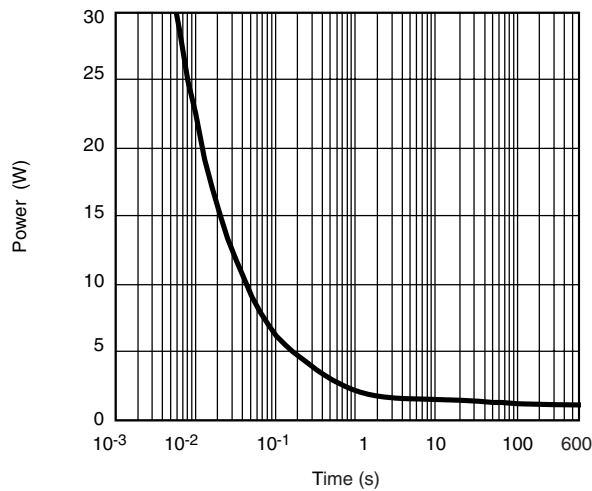
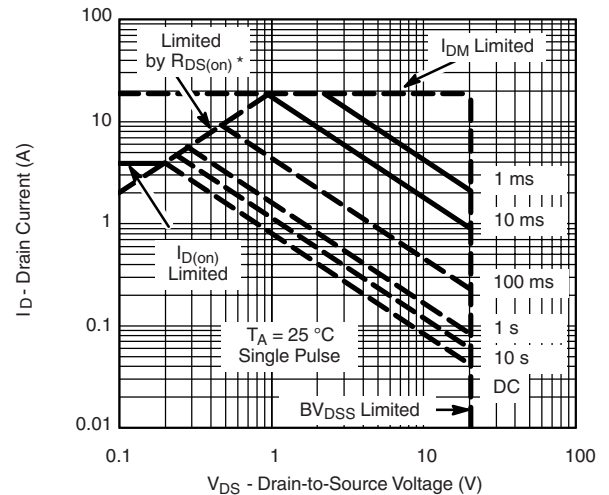
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

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.

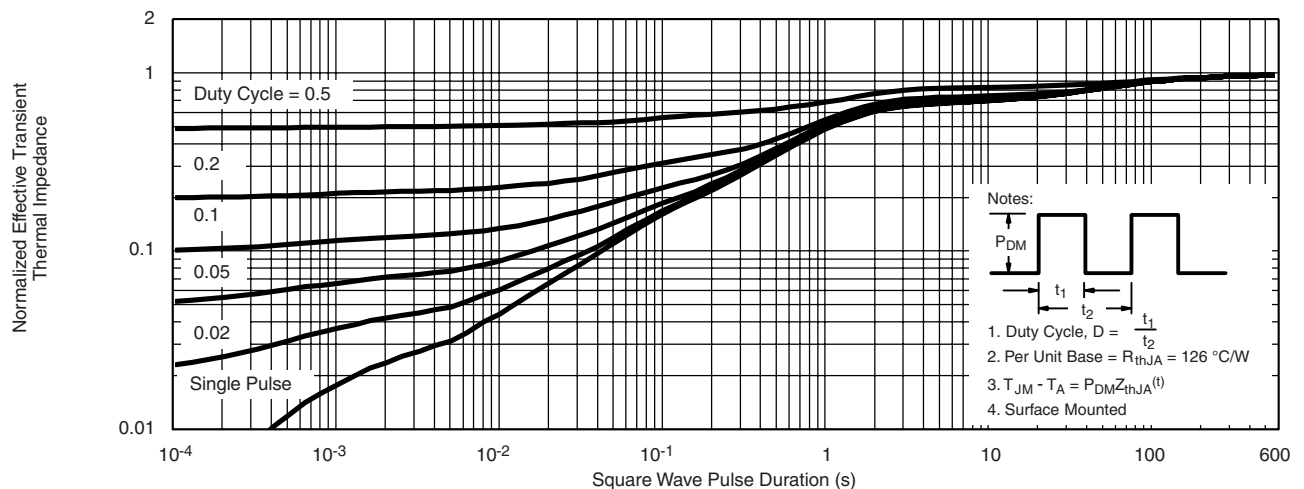
TYPICAL CHARACTERISTICS $25\text{ }^{\circ}\text{C}$, unless otherwise noted



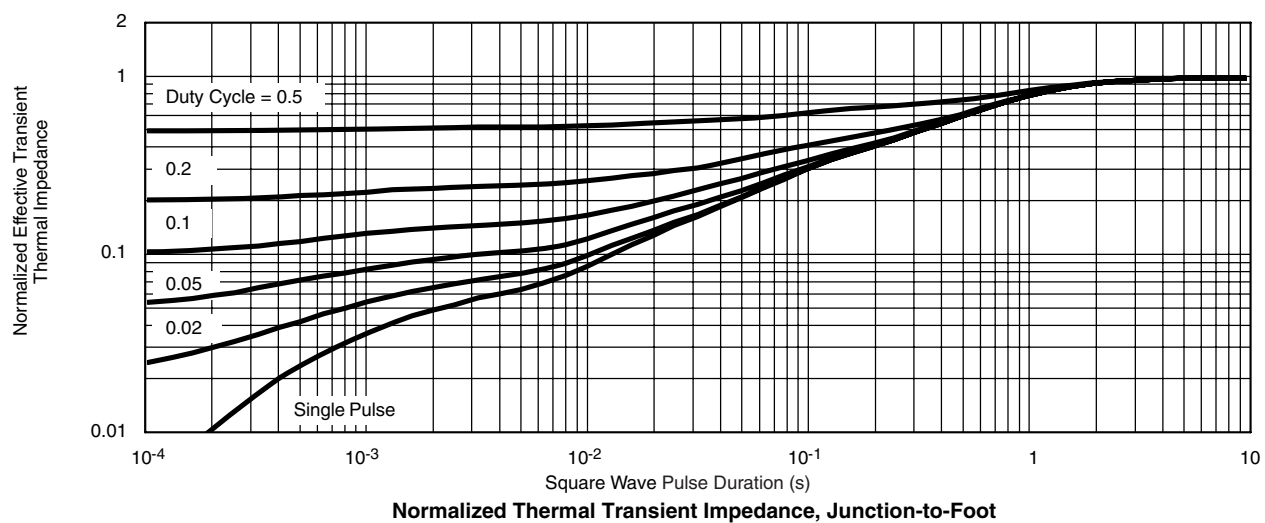
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Gate Charge****On-Resistance vs. Junction Temperature****Source-Drain Diode Forward Voltage**

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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, Junction-to-Case

Normalized Thermal Transient Impedance, Junction-to-Ambient
Notes:

1. Duty Cycle, $D = \frac{t_1}{t_2}$
2. Per Unit Base = $R_{thJA} = 126$ °C/W
3. $T_{JM} - T_A = P_{DM} Z_{thJA}(t)$
4. Surface Mounted

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 <http://www.vishay.com/ppg?73090>.



Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Vishay makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Vishay disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Vishay's knowledge of typical requirements that are often placed on Vishay products in generic applications. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time. All operating parameters, including typical parameters, must be validated for each customer application by the customer's technical experts. Product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein.

Except as expressly indicated in writing, Vishay products are not designed for use in medical, life-saving, or life-sustaining applications or for any other application in which the failure of the Vishay product could result in personal injury or death. Customers using or selling Vishay products not expressly indicated for use in such applications do so at their own risk. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay. Product names and markings noted herein may be trademarks of their respective owners.

Material Category Policy

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.

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

Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:

moschip.ru

moschip.ru_4

moschip.ru_6

moschip.ru_9