



Dual N-Channel 30-V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.022 @ $V_{GS} = 10$ V	7.5
	0.030 @ $V_{GS} = 4.5$ V	6.5

SCHOTTKY PRODUCT SUMMARY

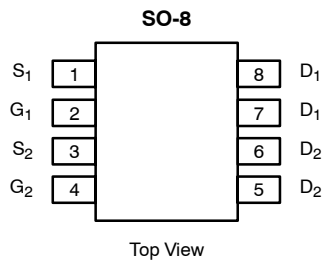
V_{DS} (V)	V_{SD} (V) Diode Forward Voltage	I_F (A)
30	0.50 V @ 1.0 A	2.0

FEATURES

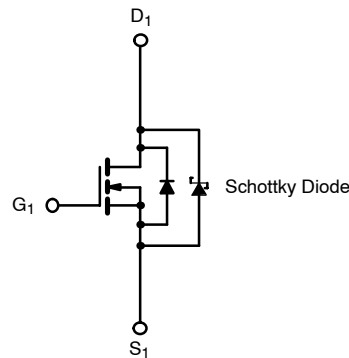
- TrenchFET® Power MOSFET
- PWM Optimized
- 100% R_g Tested

APPLICATIONS

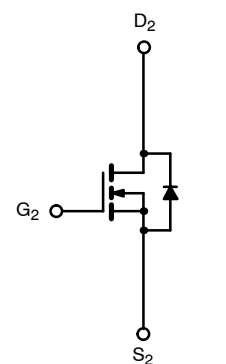
- Symmetrical Buck-Boost DC/DC Converter



Ordering Information: Si4834BDY—E3 (Lead Free)
Si4834BDY:T1—E3 (Lead Free with Tape and Reel)



N-Channel MOSFET



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	10 secs	Steady State	Unit
Drain-Source Voltage	V_{DS}	30		V
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	I_D	7.5	5.7	A
		6.0	4.6	
Pulsed Drain Current	I_{DM}	30		
Continuous Source Current (Diode Conduction) ^a	I_S	1.7	0.9	W
Maximum Power Dissipation ^a	P_D	2.0	1.1	
		1.3	0.7	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	MOSFET		Schottky		Unit
			Typ	Max	Typ	Max	
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	52	62.5	53	62.5	$^\circ\text{C/W}$
	Steady-State		93	110	93	110	
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	35	40	35	40	

Notes

a. Surface Mounted on 1" x 1" FR4 Board.

MOSFET SPECIFICATIONS (T _J = 25° C UNLESS OTHERWISE NOTED).							
Parameter	Symbol	Test Condition		Min	Typ ^a	Max	Unit
Static							
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		0.8		3.0	V
Gate-Body 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	Ch-1			100	μA
			Ch-2			1	
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 85°C	Ch-1			2000	
			Ch-2			15	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V		20			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 7.5 A			0.017	0.022	Ω
		V _{GS} = 4.5 V, I _D = 6.5 A			0.024	0.030	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 7.5 A			19		S
Diode Forward Voltage ^b	V _{SD}	I _S = 1 A, V _{GS} = 0 V	Ch-1		0.47	0.5	V
			Ch-2		0.75	1.2	
Dynamic ^a							
Total Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 7.5 A			7	11	nC
Gate-Source Charge	Q _{gs}				2.9		
Gate-Drain Charge	Q _{gd}				2.5		
Gate Resistance	R _g			0.5	1.5	2.6	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _g = 6 Ω			9	15	ns
Rise Time	t _r				10	17	
Turn-Off Delay Time	t _{d(off)}				19	30	
Fall Time	t _f				9	15	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 1.7 A, di/dt = 100 A/μs	Ch-1		32	55	
			Ch-2		35	55	

Notes

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

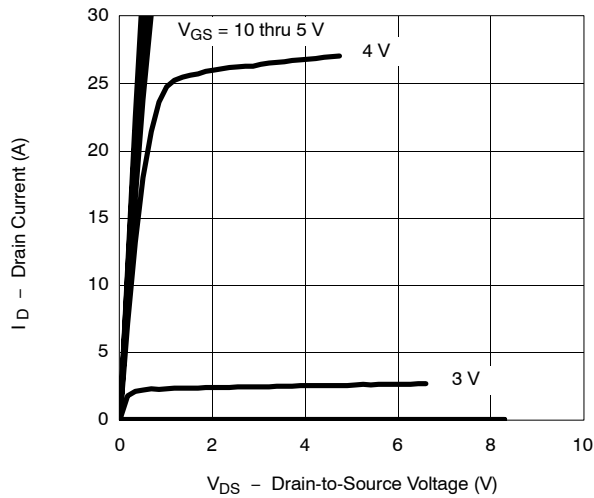
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0\ \text{A}$		0.47	0.50	V
		$I_F = 1.0\ \text{A}, T_J = 125^\circ\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 30\ \text{V}$		0.004	0.100	mA
		$V_r = 30\ \text{V}, T_J = 100^\circ\text{C}$		0.7	10	
		$V_r = -30\ \text{V}, T_J = 125^\circ\text{C}$		3.0	20	
Junction Capacitance	C_T	$V_r = 10\ \text{V}$		50		pF



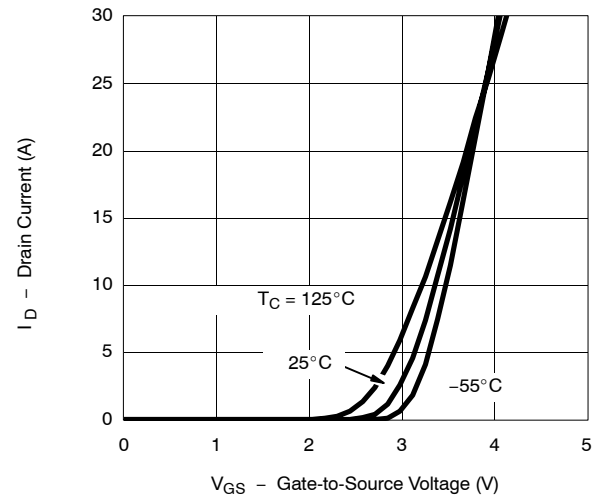
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET

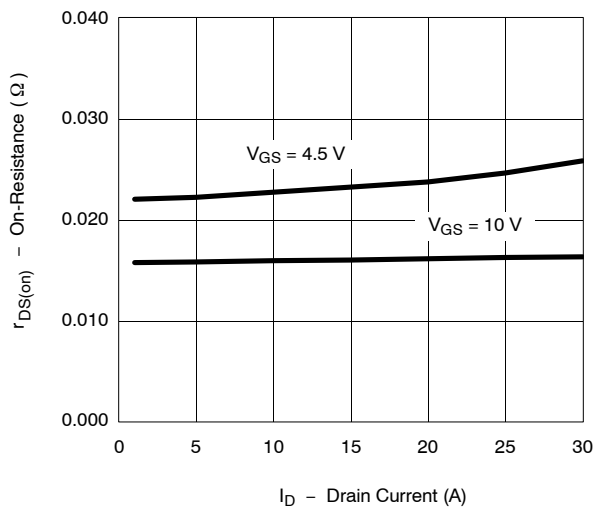
Output Characteristics



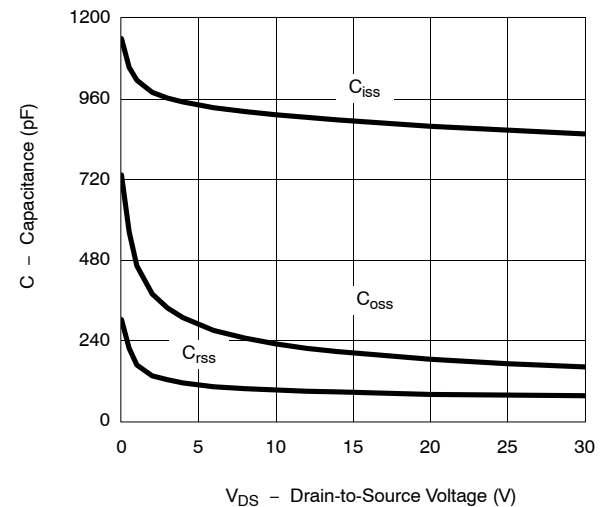
Transfer Characteristics



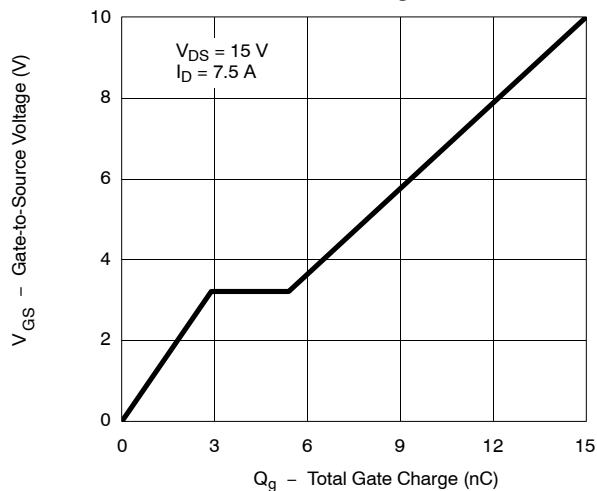
On-Resistance vs. Drain Current



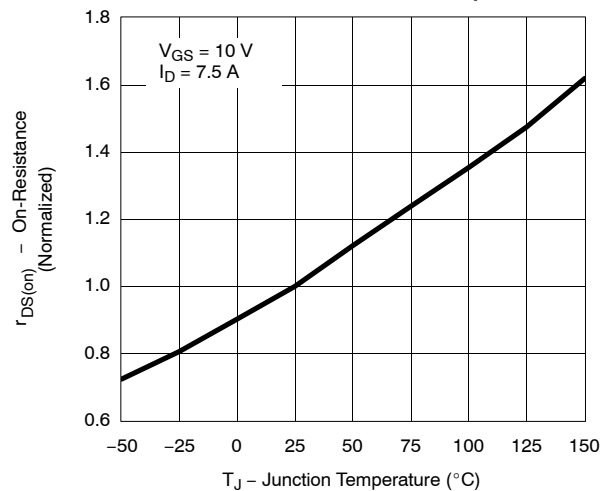
Capacitance



Gate Charge



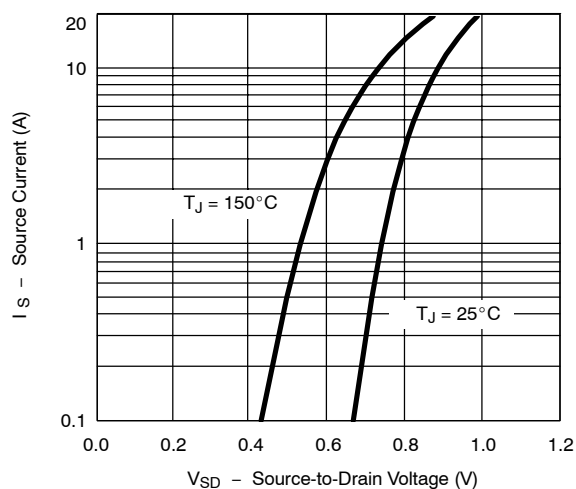
On-Resistance vs. Junction Temperature



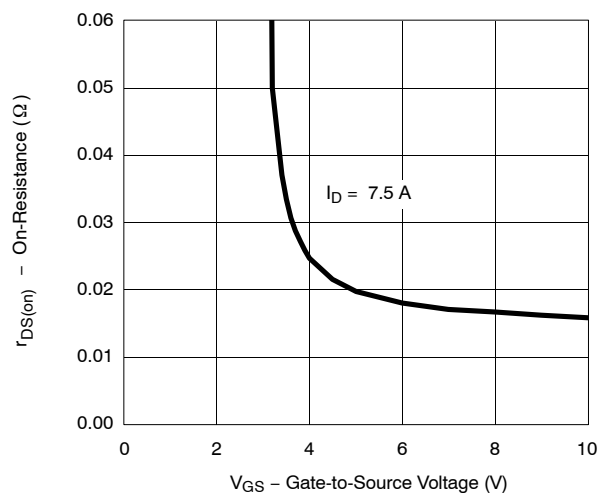
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET

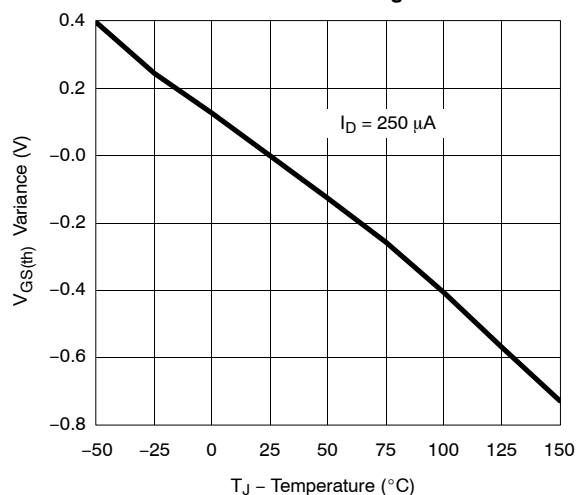
Source-Drain Diode Forward Voltage



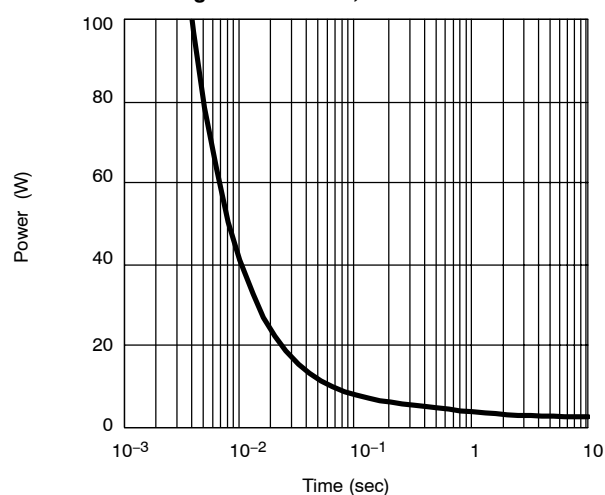
On-Resistance vs. Gate-to-Source Voltage



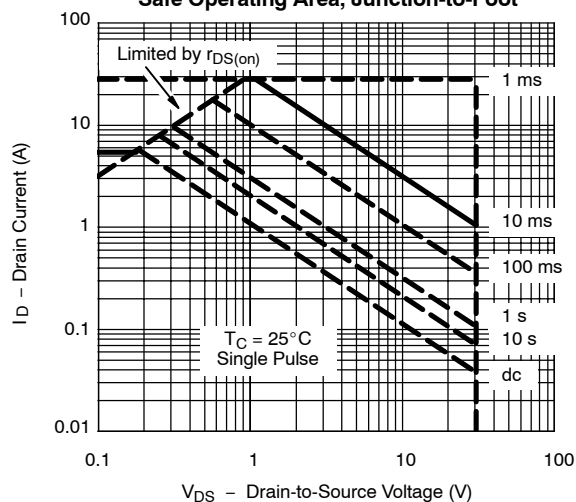
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Foot

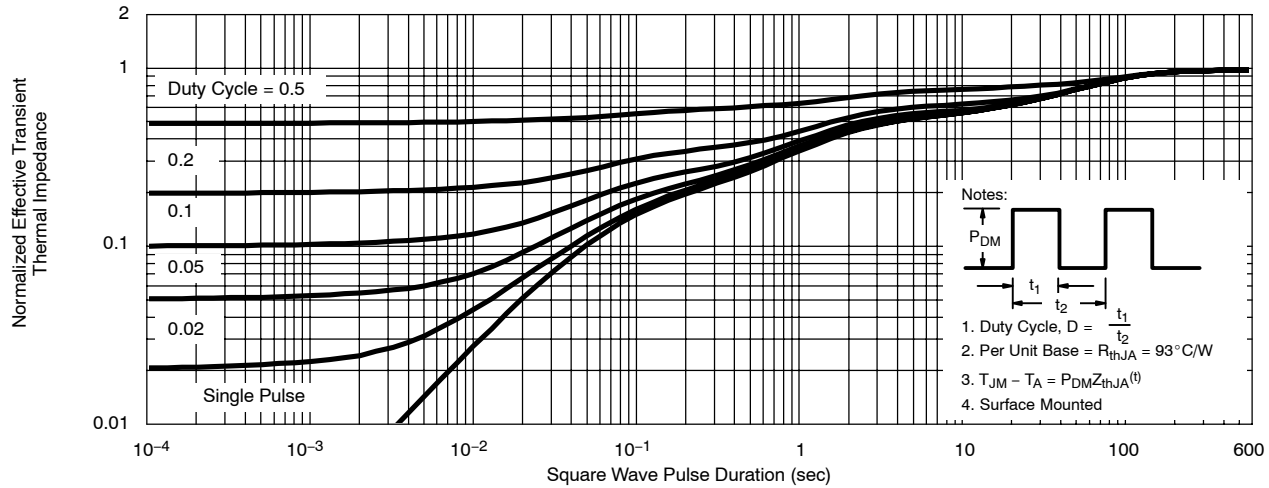




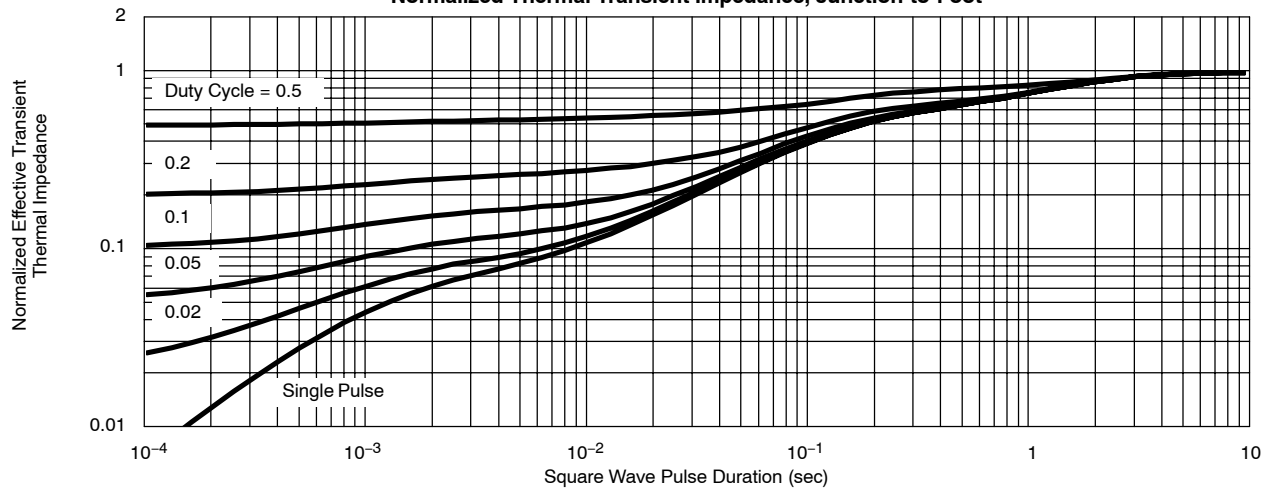
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET

Normalized Thermal Transient Impedance, Junction-to-Ambient

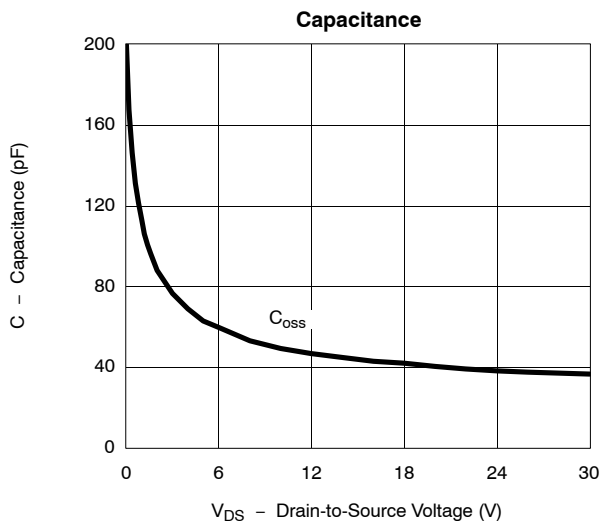
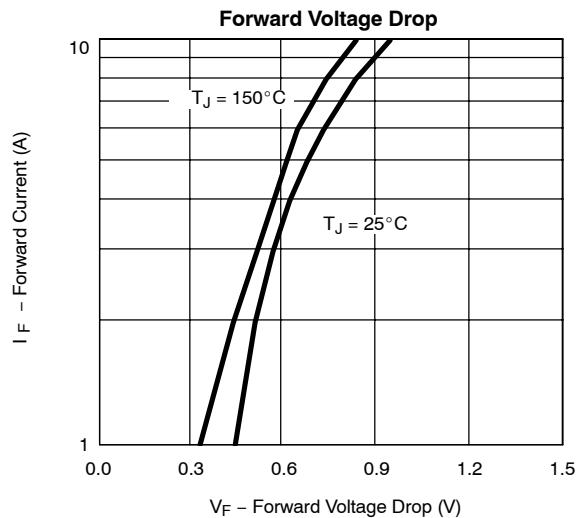
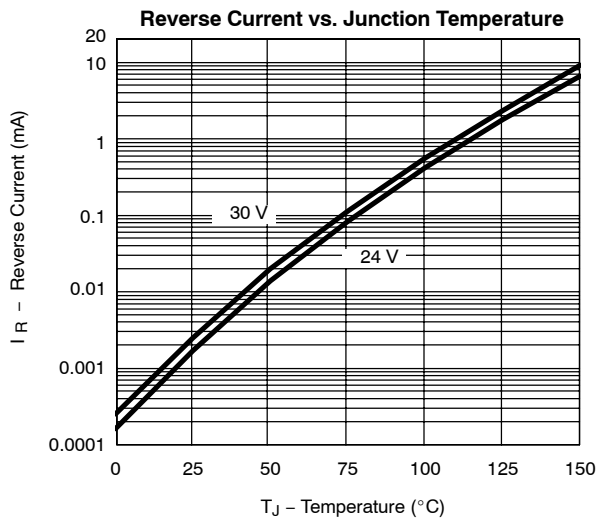


Normalized Thermal Transient Impedance, Junction-to-Foot





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) **SCHOTTKY**





Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.