



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

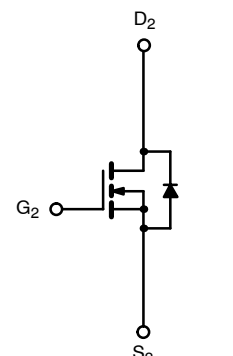
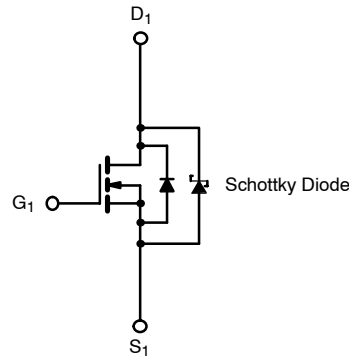
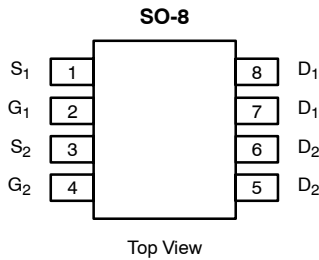
SCHOTTKY PRODUCT SUMMARY		
V_{DS} (V)	V_{SD} (V) Diode Forward Voltage	I_F (A)
30	0.50 V @ 1.0 A	2.0

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)

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	$T_A = 25^\circ\text{C}$	7.5	5.7
		$T_A = 70^\circ\text{C}$	6.0	4.6
Pulsed Drain Current	I_{DM}	30		A
Continuous Source Current (Diode Conduction) ^a	I_S	1.7	0.9	
Maximum Power Dissipation ^a	P_D	$T_A = 25^\circ\text{C}$	2.0	1.1
		$T_A = 70^\circ\text{C}$	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	R_{thJA}	$t \leq 10$ sec	52	62.5	53	62.5
		Steady-State	93	110	93	110
Maximum Junction-to-Foot (Drain)	R_{thJF}	35	40	35	40	$^\circ\text{C/W}$

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

MOSFET SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED).							
Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit	
Static							
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250 \mu\text{A}$	0.8		3.0	V	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$	Ch-1		100	μA	
			Ch-2		1		
		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$	Ch-1		2000		
			Ch-2		15		
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5 \text{ V}, V_{GS} = 10 \text{ V}$	20			A	
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10 \text{ V}, I_D = 7.5 \text{ A}$		0.017	0.022	Ω	
		$V_{GS} = 4.5 \text{ V}, I_D = 6.5 \text{ A}$		0.024	0.030		
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15 \text{ V}, I_D = 7.5 \text{ A}$		19		S	
Diode Forward Voltage ^b	V_{SD}	$I_S = 1 \text{ A}, V_{GS} = 0 \text{ V}$	Ch-1		0.47	0.5	V
			Ch-2		0.75	1.2	
Dynamic^a							
Total Gate Charge	Q_g	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 7.5 \text{ A}$		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	$t_{d(on)}$	$V_{DD} = 15 \text{ V}, R_L = 15 \Omega$ $I_D \cong 1 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 6 \Omega$		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}	$I_F = 1.7 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$	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 $\leq 2\%$.

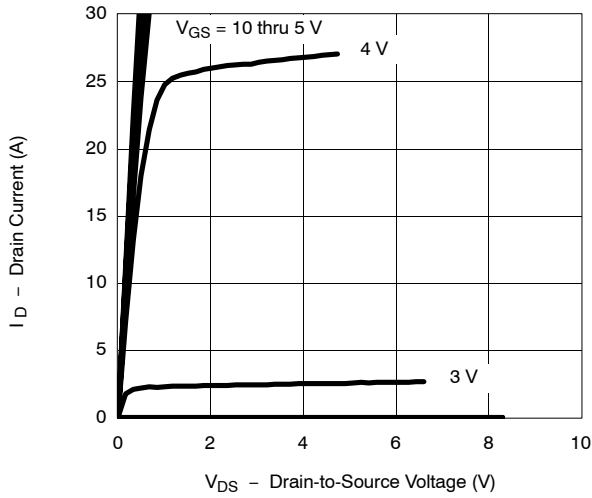
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 1.0 \text{ A}$		0.47	0.50	V
		$I_F = 1.0 \text{ A}, T_J = 125^\circ\text{C}$		0.36	0.42	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 30 \text{ V}$		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



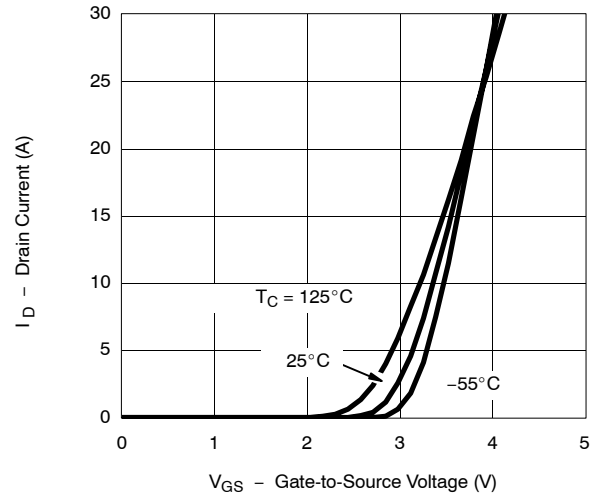
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET

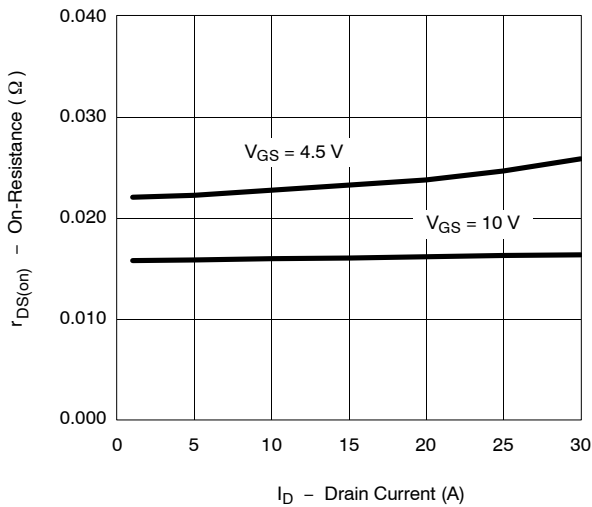
Output Characteristics



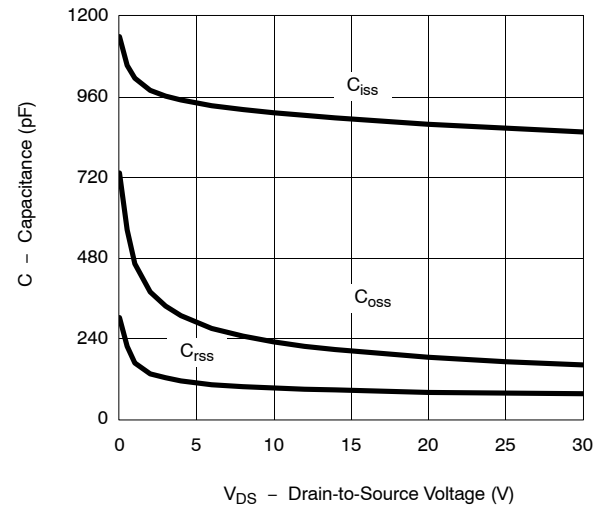
Transfer Characteristics



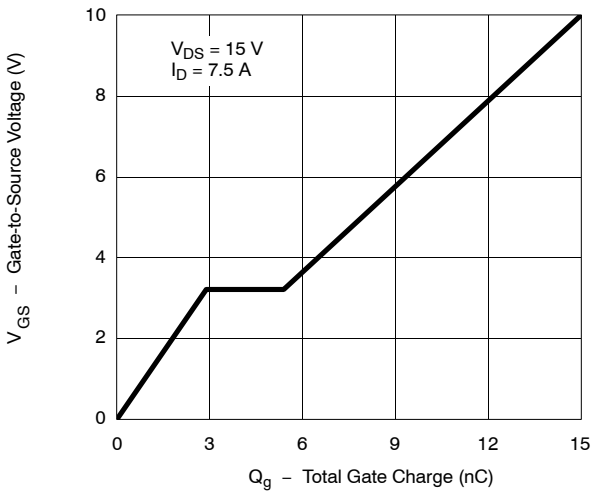
On-Resistance vs. Drain Current



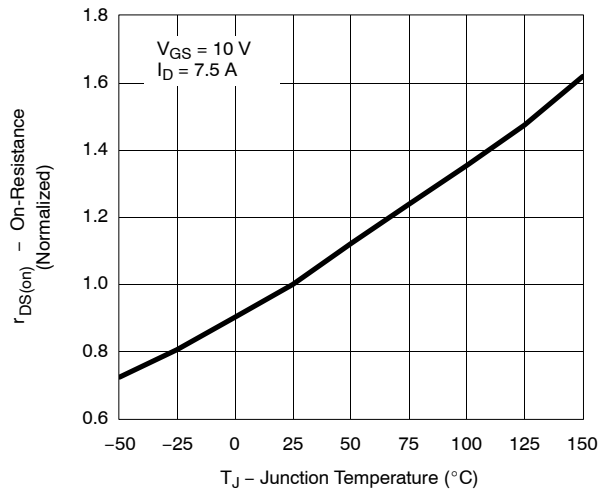
Capacitance



Gate Charge

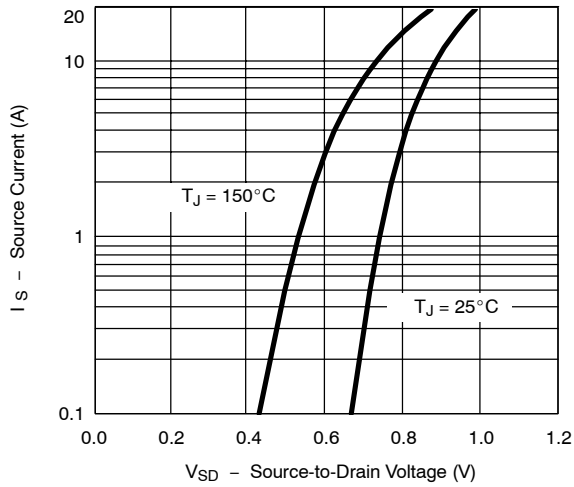


On-Resistance vs. Junction Temperature

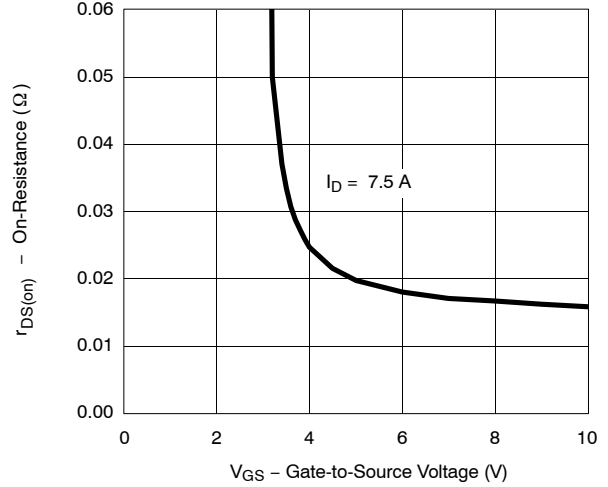


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED) MOSFET

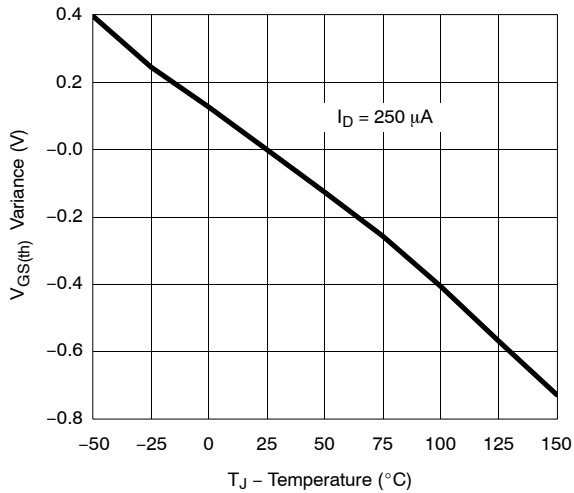
Source-Drain Diode Forward Voltage



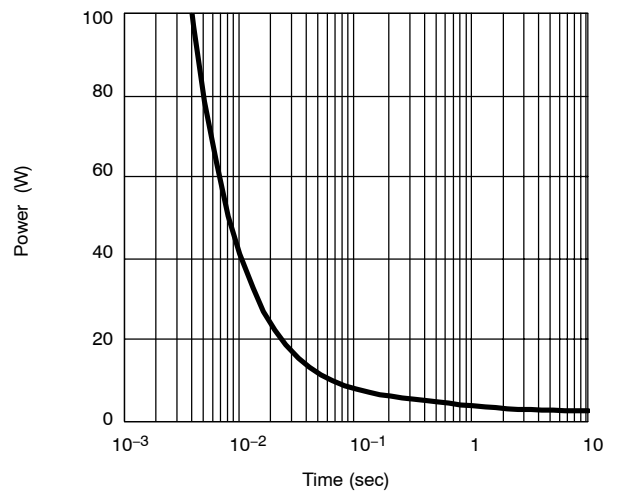
On-Resistance vs. Gate-to-Source Voltage



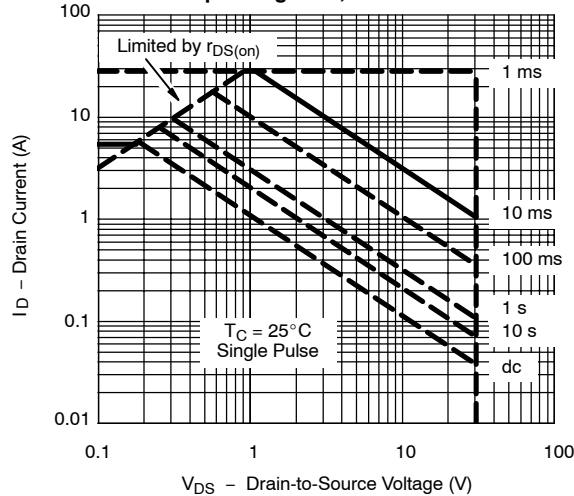
Threshold Voltage



Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Foot

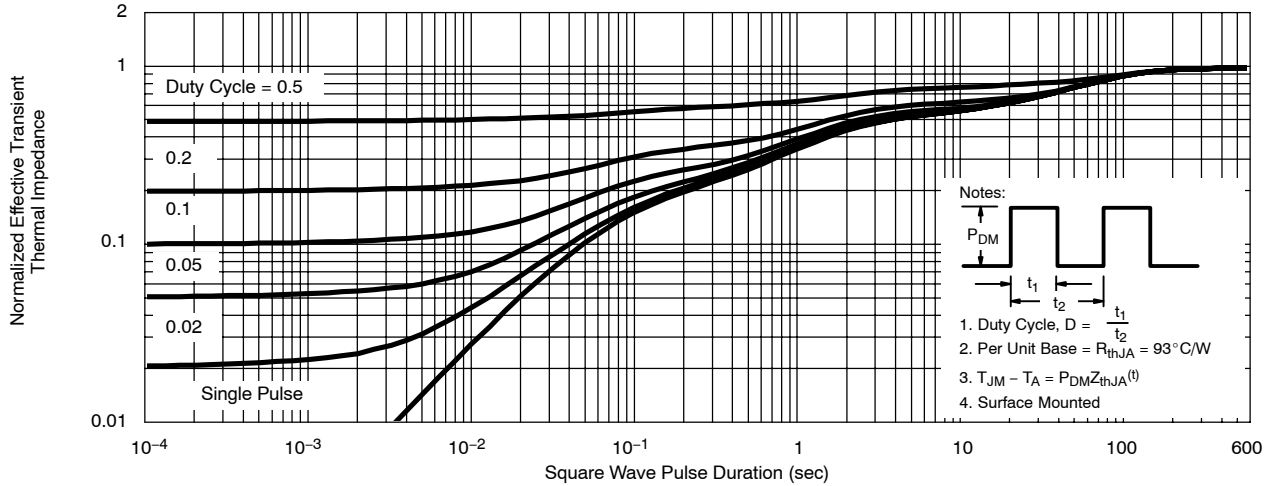




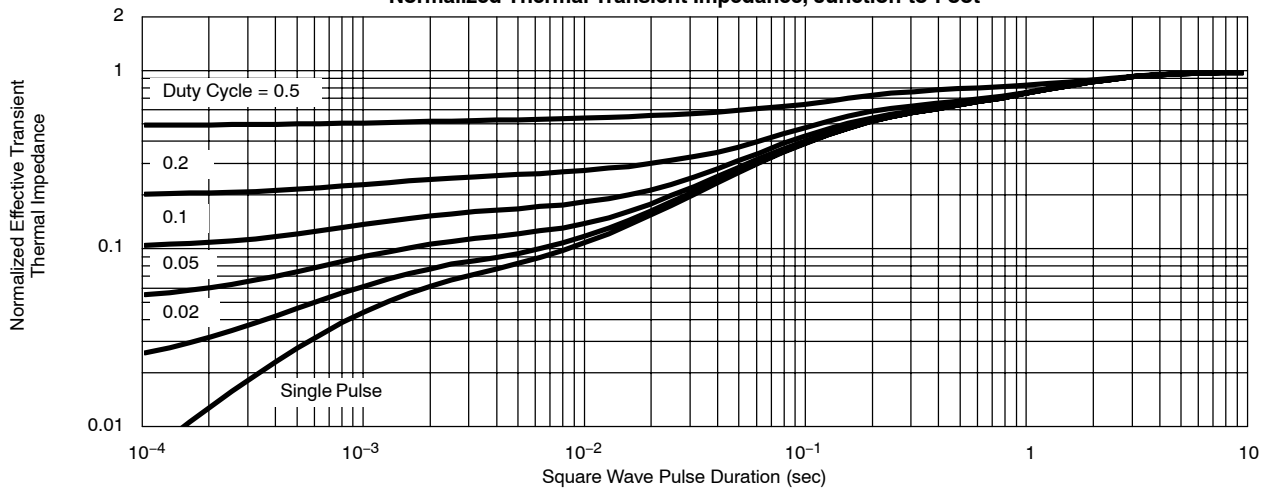
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

MOSFET

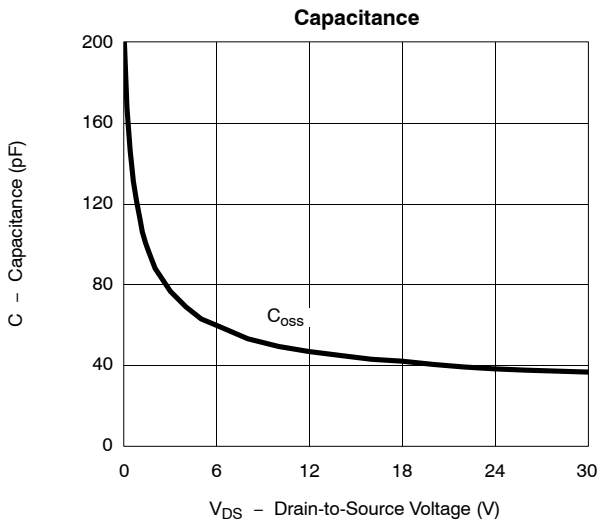
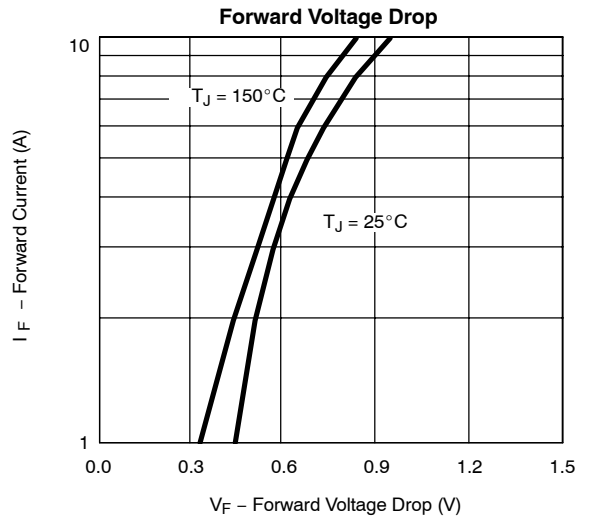
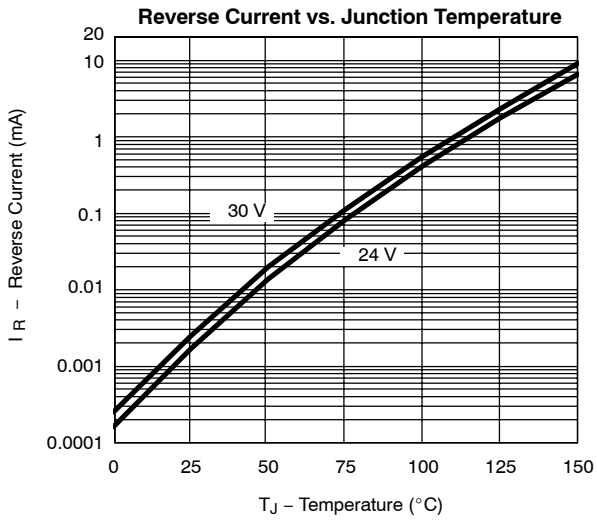
Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot



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





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