



New Product

Si3851DV

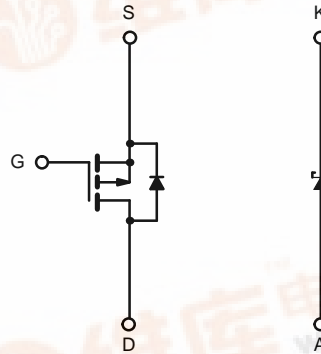
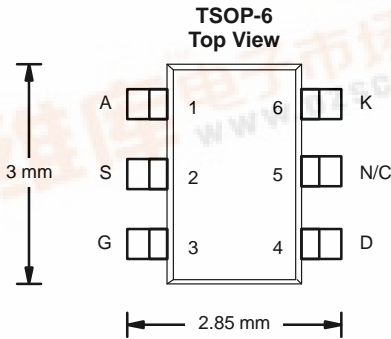
Vishay Siliconix

## P-Channel 30-V (D-S) MOSFET With Schottky Diode

MOSFET PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-30	0.200 @ $V_{GS} = -10$ V	$\pm 1.8$
	0.360 @ $V_{GS} = -4.5$ V	$\pm 1.2$

SCHOTTKY PRODUCT SUMMARY		
$V_{KA}$ (V)	$V_f$ (V) Diode Forward Voltage	$I_F$ (A)
30	0.5 V @ 0.5 A	0.5

LITTLE FOOT Plus™



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	5 sec	Steady State	Unit
Drain-Source Voltage (MOSFET and Schottky)	$V_{DS}$		-30	V
Reverse Voltage (Schottky)	$V_{KA}$		30	
Gate-Source Voltage (MOSFET)	$V_{GS}$	$\pm 20$	$\pm 20$	A
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) (MOSFET) <sup>a</sup>	$I_D$	$T_A = 25^\circ\text{C}$	$\pm 1.8$	
		$T_A = 70^\circ\text{C}$	$\pm 1.5$	
Pulsed Drain Current (MOSFET)	$I_{DM}$		$\pm 7$	
Continuous Source Current (MOSFET Diode Conduction) <sup>a</sup>	$I_S$	-1.05	-0.75	
Average Forward Current (Schottky)	$I_F$		0.5	
Pulsed Forward Current (Schottky)	$I_{FM}$		7	
Maximum Power Dissipation (MOSFET) <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.15	W
		$T_A = 70^\circ\text{C}$	0.73	
Maximum Power Dissipation (Schottky) <sup>a</sup>	$P_D$	$T_A = 25^\circ\text{C}$	1.0	
		$T_A = 70^\circ\text{C}$	0.64	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$		-55 to 150	$^\circ\text{C}$

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



THERMAL RESISTANCE RATINGS						
Parameter		Device	Symbol	Typical	Maximum	Unit
Junction-to-Ambient	$t \leq 5 \text{ sec}$	MOSFET	$R_{thJA}$	93	110	$^{\circ}\text{C/W}$
		Schottky		103	125	
	Steady State	MOSFET		130	150	
		Schottky		140	165	
Junction-to-Foot	Steady State	MOSFET	$R_{thJF}$	75	90	$^{\circ}\text{C/W}$
		Schottky	80	95		

## 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	Max	Unit
<b>Static</b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-1.0			V
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}$			-1	$\mu\text{A}$
		$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 75^{\circ}\text{C}$			-10	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq -5 \text{ V}, V_{GS} = -10 \text{ V}$	-5			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10 \text{ V}, I_D = -1.8 \text{ A}$		0.165	0.200	$\Omega$
		$V_{GS} = -4.5 \text{ V}, I_D = -1.2 \text{ A}$		0.298	0.360	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15 \text{ V}, I_D = -1.8 \text{ A}$		2.4		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -1.05 \text{ A}, V_{GS} = 0 \text{ V}$		-0.83	-1.10	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -15 \text{ V}, V_{GS} = -5 \text{ V}, I_D = -1.8 \text{ A}$		2.4	3.6	nC
Gate-Source Charge	$Q_{gs}$			0.9		
Gate-Drain Charge	$Q_{gd}$			0.8		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15 \text{ V}, R_L = 15 \Omega$ $I_D \cong -1 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 6 \Omega$		8	12	ns
Rise Time	$t_r$			12	18	
Turn-Off Delay Time	$t_{d(off)}$			12	18	
Fall Time	$t_f$			7	11	
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = -1.05 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$		30	60	

## Notes

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

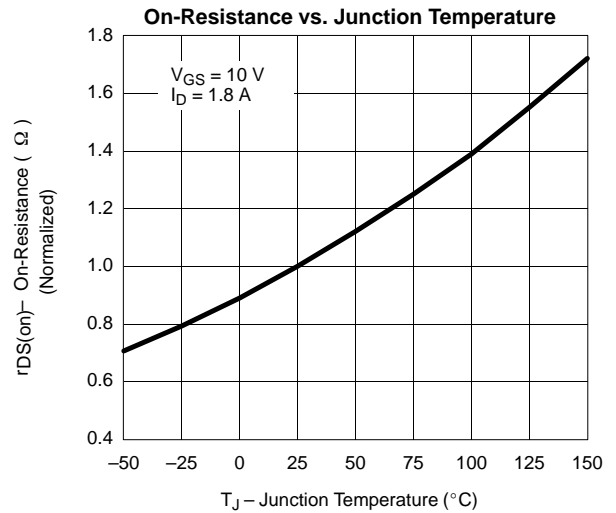
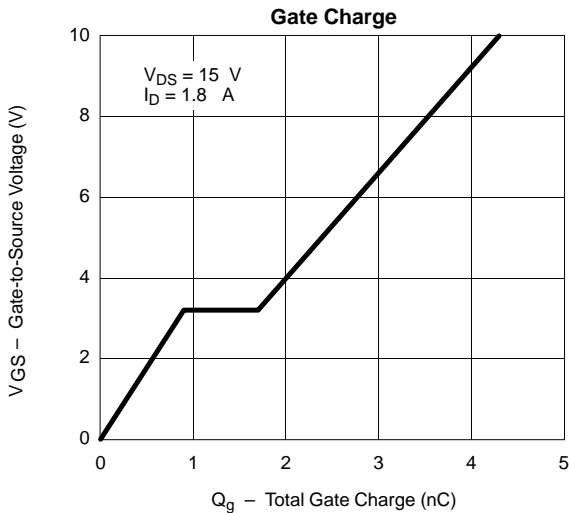
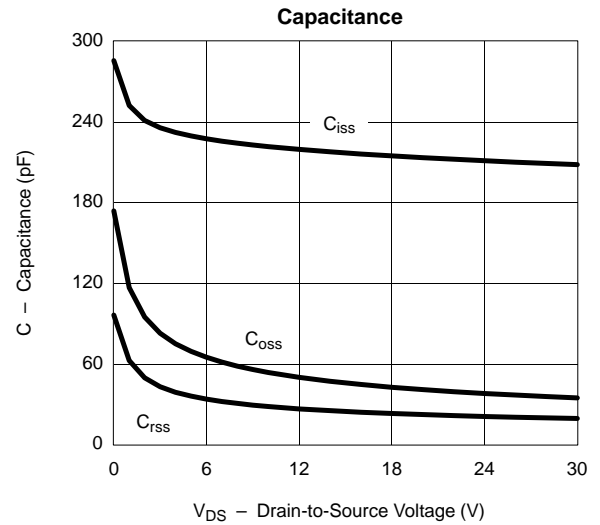
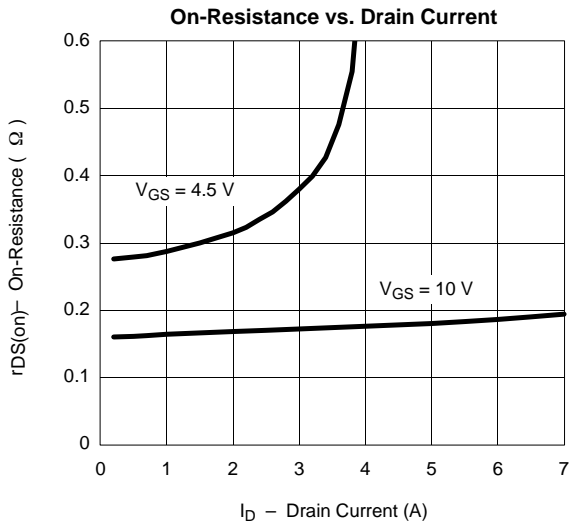
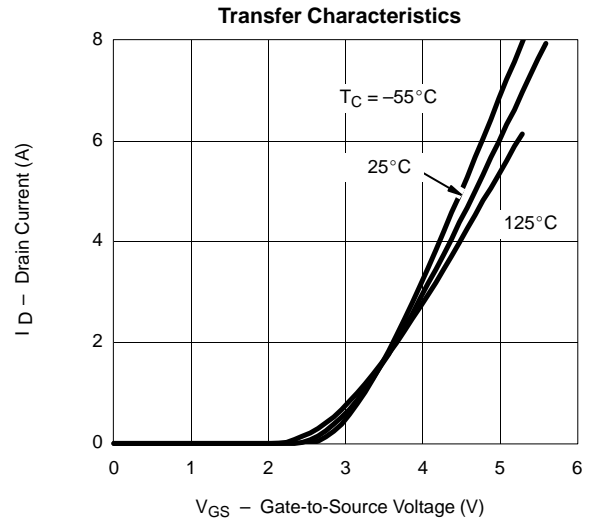
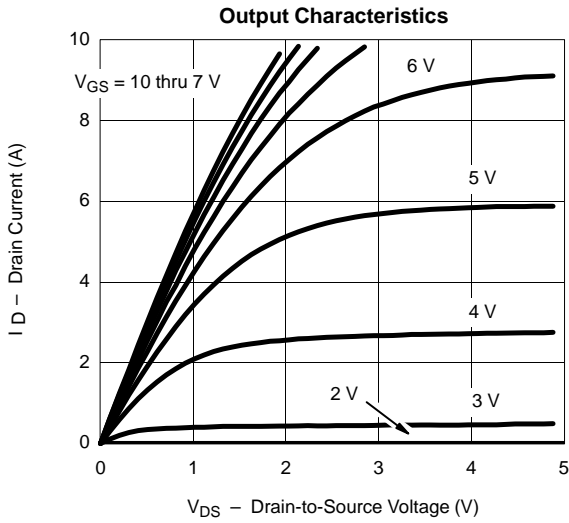
b. Guaranteed by design, not subject to production testing.

SCHOTTKY SPECIFICATIONS ( $T_J = 25^{\circ}\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	$V_F$	$I_F = 0.5 \text{ A}$		0.45	0.5	V
		$I_F = 0.5 \text{ A}, T_J = 125^{\circ}\text{C}$		0.35	0.4	
Maximum Reverse Leakage Current	$I_{rm}$	$V_r = 30 \text{ V}$		0.002	0.100	mA
		$V_r = 30 \text{ V}, T_J = 75^{\circ}\text{C}$		0.06	1	
		$V_r = 30 \text{ V}, T_J = 125^{\circ}\text{C}$		1.5	10	
Junction Capacitance	$C_T$	$V_r = 10 \text{ V}$		24		pF



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

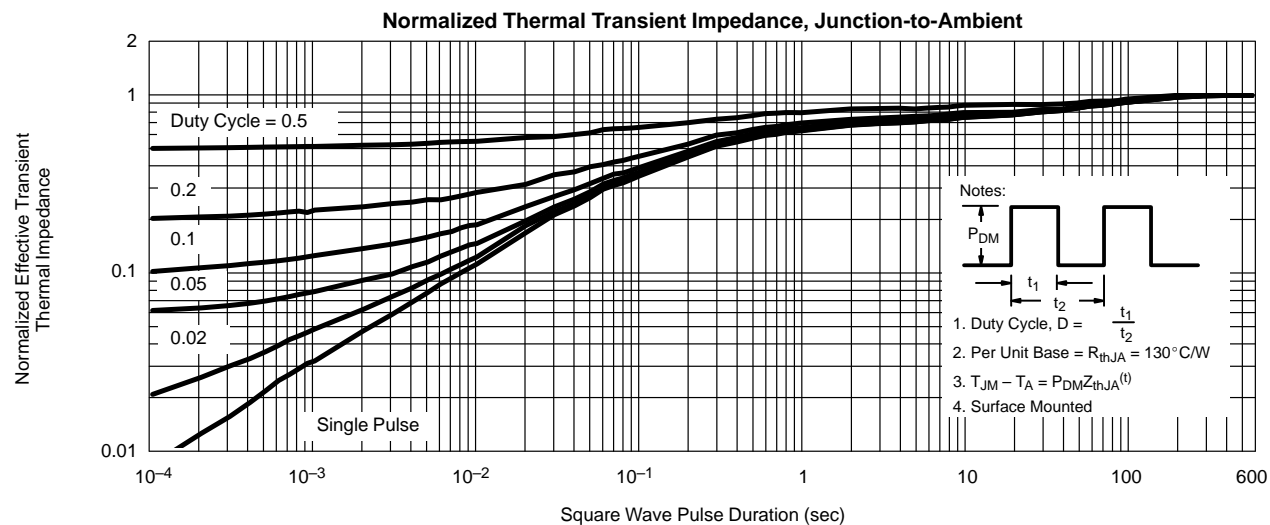
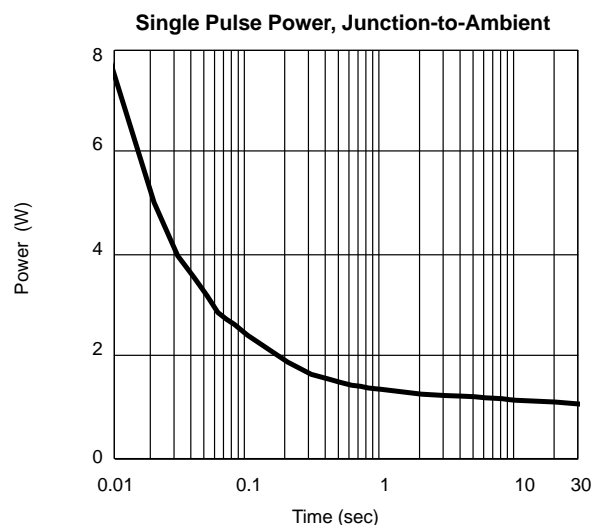
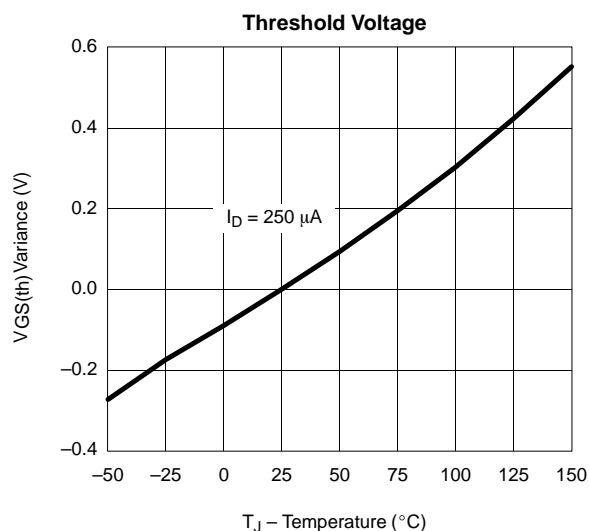
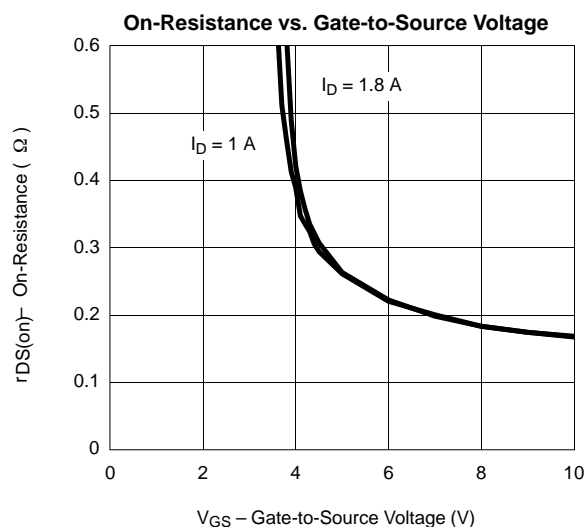
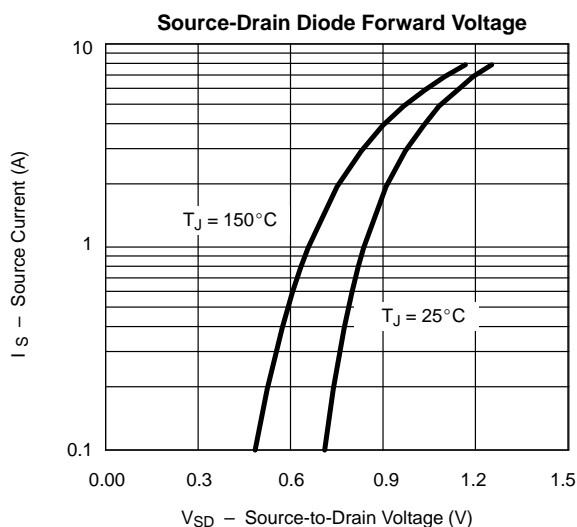
**MOSFET**





#### TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET



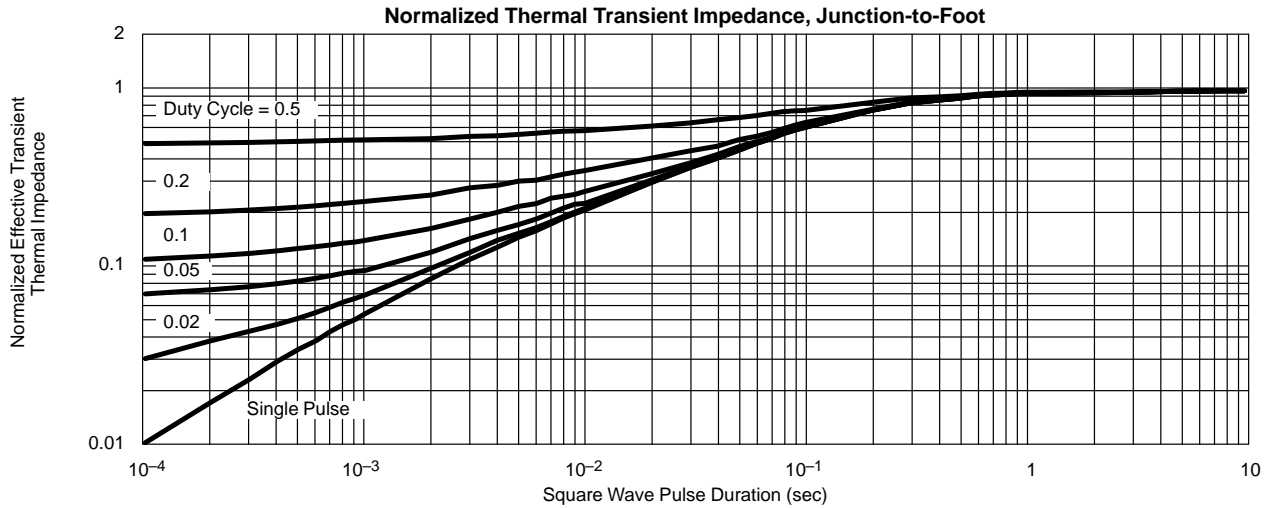


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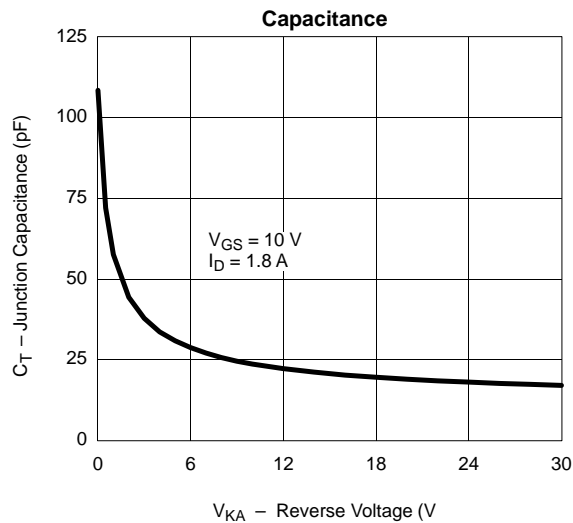
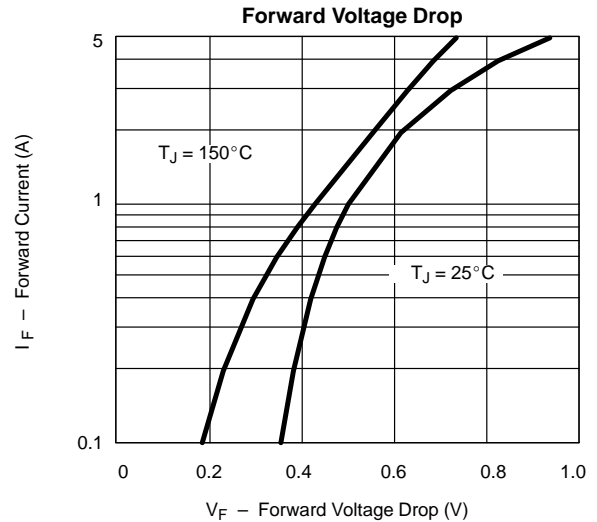
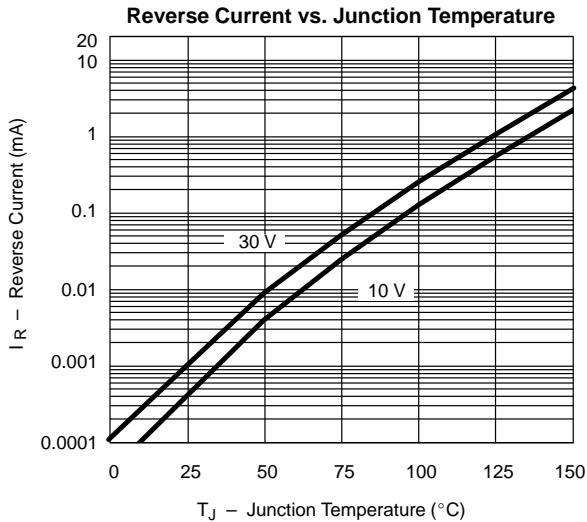
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**MOSFET**



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**SCHOTTKY**





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