



Single P-Channel 20-V (D-S) MOSFET With Schottky Diode

MOSFET PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.048 @ $V_{GS} = -4.5$ V	-6.3
	0.068 @ $V_{GS} = -2.5$ V	-5.3
	0.090 @ $V_{GS} = -1.8$ V	-4.6

SCHOTTKY PRODUCT SUMMARY

V_{KA} (V)	V_f (V) Diode Forward Voltage	I_F (A)
20	0.48 V @ 0.5 A	1.0

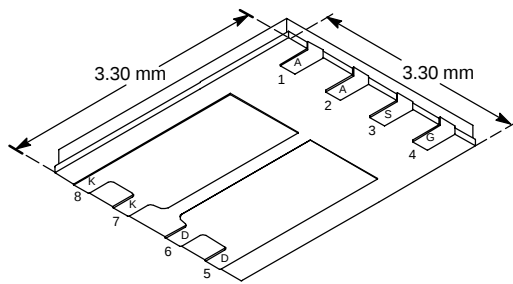
FEATURES

- TrenchFET® Power MOSFETs: 1.8-V Rated
- ESD Protected: 4500 V
- Ultra-Low Thermal Resistance, PowerPAK™ Package with Low 1.07-mm Profile

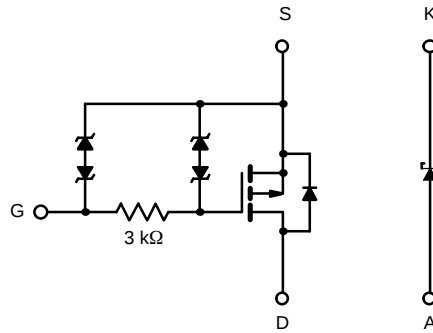
APPLICATIONS

- Charger Switching

PowerPAK™ 1212-8



Bottom View



P-Channel MOSFET

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

Parameter		Symbol	10 sec	Steady State	Unit
Drain-Source Voltage (MOSFET and Schottky)		V_{DS}	−20		V
Reverse Voltage (Schottky)		V_{KA}	20		
Gate-Source Voltage (MOSFET)		V_{GS}	± 12	± 12	
Continuous Drain Current ($T_J = 150^{\circ}\text{C}$) (MOSFET) ^a	$T_A = 25^{\circ}\text{C}$	I_D	−6.3	−4.3	A
	$T_A = 85^{\circ}\text{C}$		−4.5	−3.1	
Pulsed Drain Current (MOSFET)		I_{DM}	−20		
Continuous Source Current (MOSFET Diode Conduction) ^a		I_S	−2.3	−1.1	
Average Foward Current (Schottky)		I_F	1.0		
Pulsed Foward Current (Schottky)		I_{FM}	7		
Maximum Power Dissipation (MOSFET) ^a	$T_A = 25^{\circ}\text{C}$	P_D	2.8	1.3	W
	$T_A = 85^{\circ}\text{C}$		1.5	0.7	
Maximum Power Dissipation (Schottky) ^a	$T_A = 25^{\circ}\text{C}$		2.0	1.1	
	$T_A = 85^{\circ}\text{C}$		1.0	0.6	
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 ^a	$t \leq 10$ sec	MOSFET	R_{thJA}	35	44	°C/W
		Schottky		51	64	
	Steady State	MOSFET		75	94	
		Schottky		91	115	
Junction-to-Case (Drain)	Steady State	MOSFET	R_{thJC}	4	5	
		Schottky		10	12	

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
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -800 \mu\text{A}$	-0.45			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 4.5 \text{ V}$			± 1.5	μA
		$V_{DS} = 0 \text{ V}, V_{GS} = \pm 12 \text{ V}$			± 100	mA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}$			-1	μA
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 85^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5 \text{ V}, V_{GS} = -4.5 \text{ V}$	-20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5 \text{ V}, I_D = -6.3 \text{ A}$		0.041	0.048	Ω
		$V_{GS} = -2.5 \text{ V}, I_D = -5.3 \text{ A}$		0.057	0.068	
		$V_{GS} = -1.8 \text{ V}, I_D = -1 \text{ A}$		0.072	0.090	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10 \text{ V}, I_D = -6.3 \text{ A}$		14		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -2.3 \text{ A}, V_{GS} = 0 \text{ V}$		-0.8	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -6.3 \text{ A}$		12	18	nC
Gate-Source Charge	Q_{gs}			2.5		
Gate-Drain Charge	Q_{gd}			2.9		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10 \text{ V}, R_L = 10 \Omega$ $I_D \cong -1 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_G = 6 \Omega$		2.5	4	ns
Rise Time	t_r			4	6	
Turn-Off Delay Time	$t_{d(off)}$			15	23	
Fall Time	t_f			12	18	

Notes

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

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

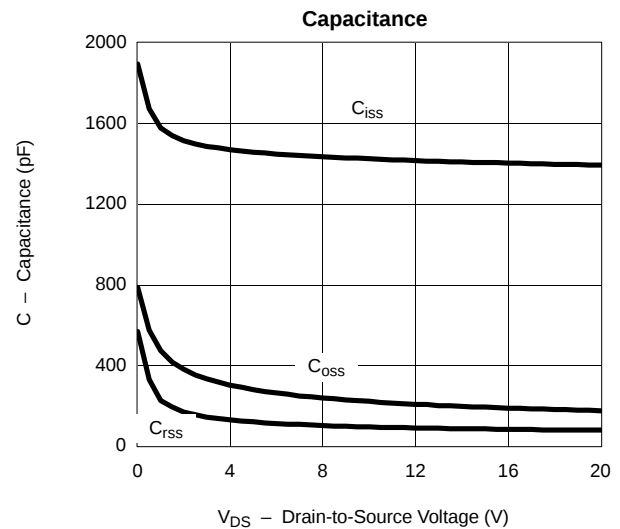
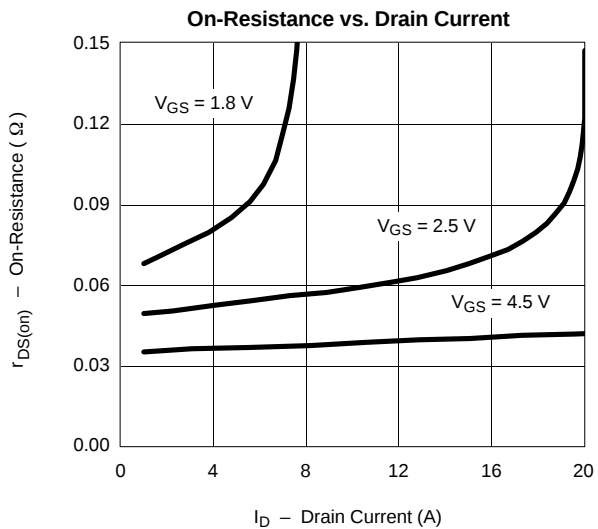
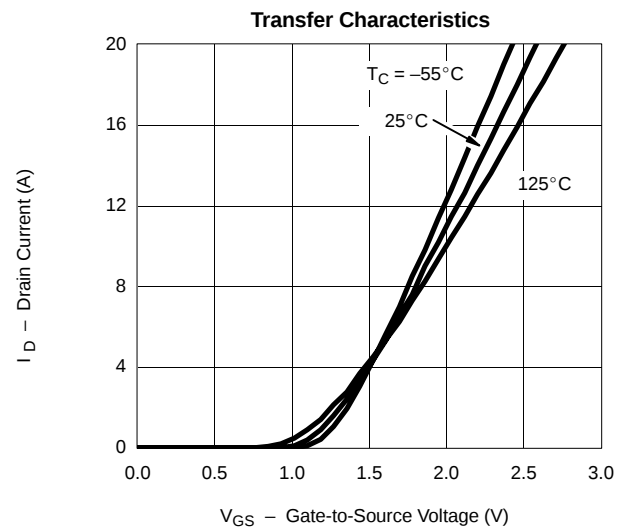
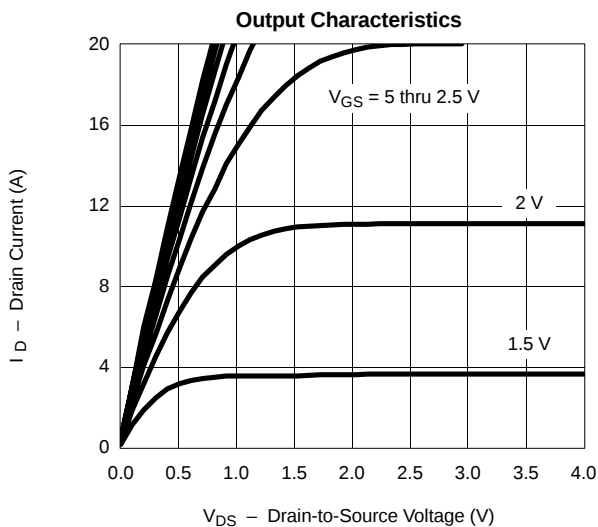
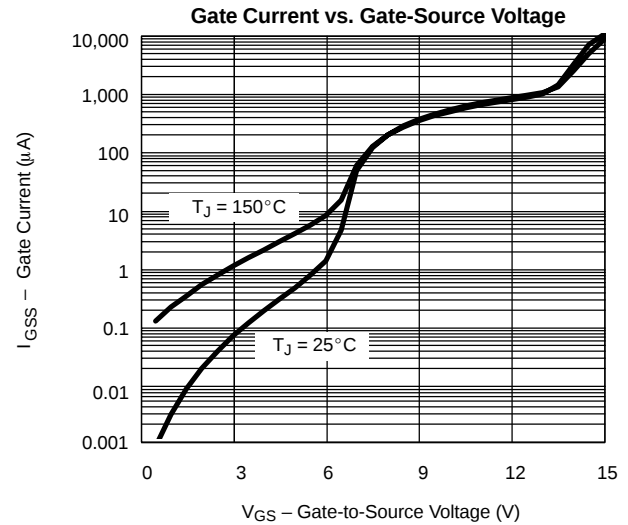
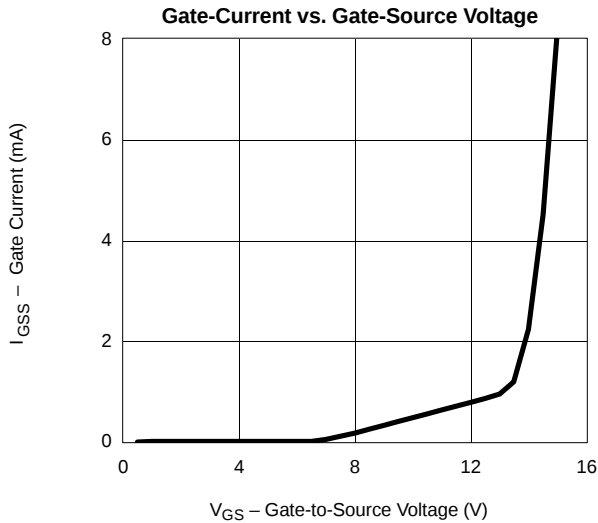
SCHOTTKY SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	V_F	$I_F = 0.5 \text{ A}$		0.42	0.48	V
		$I_F = 0.5 \text{ A}, T_J = 125^\circ\text{C}$		0.33	0.4	
Maximum Reverse Leakage Current	I_{rm}	$V_r = 20 \text{ V}$		0.002	0.100	mA
		$V_r = 20 \text{ V}, T_J = 85^\circ\text{C}$		0.10	1	
		$V_r = 20 \text{ V}, T_J = 125^\circ\text{C}$		1.5	10	
Junction Capacitance	C_T	$V_r = 10 \text{ V}$		31		pF



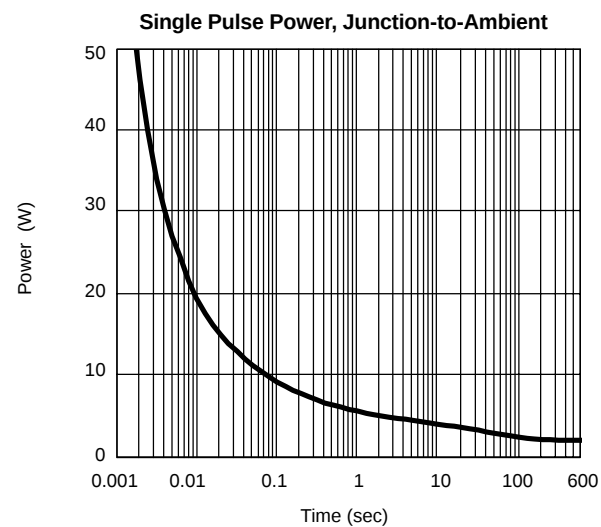
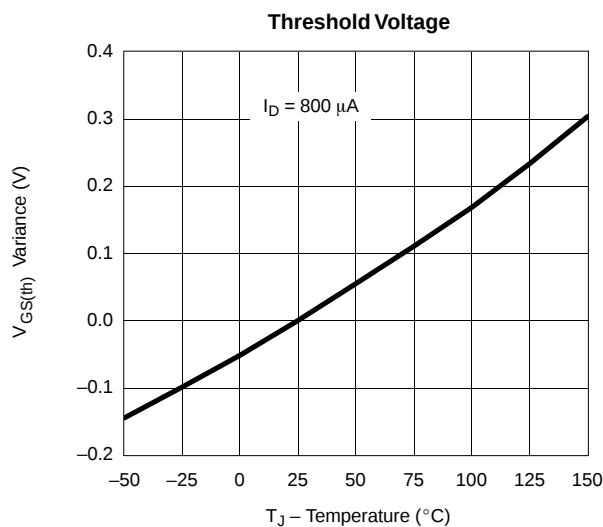
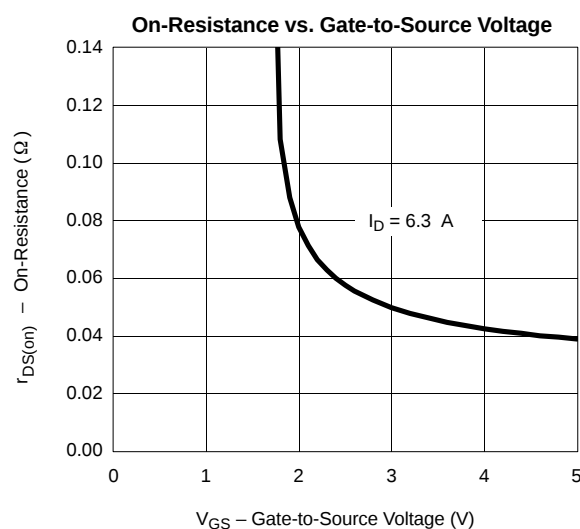
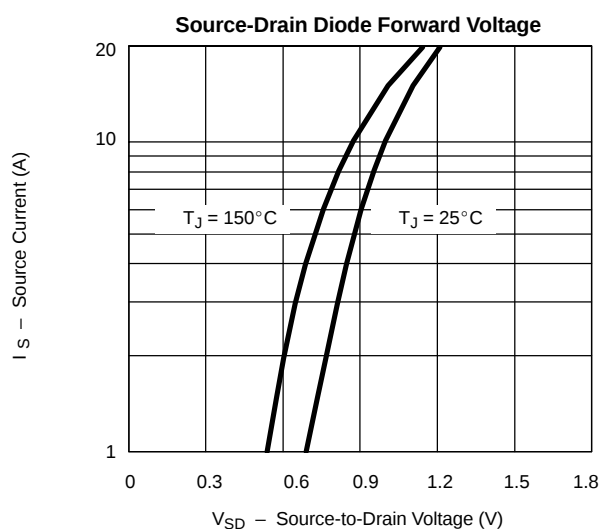
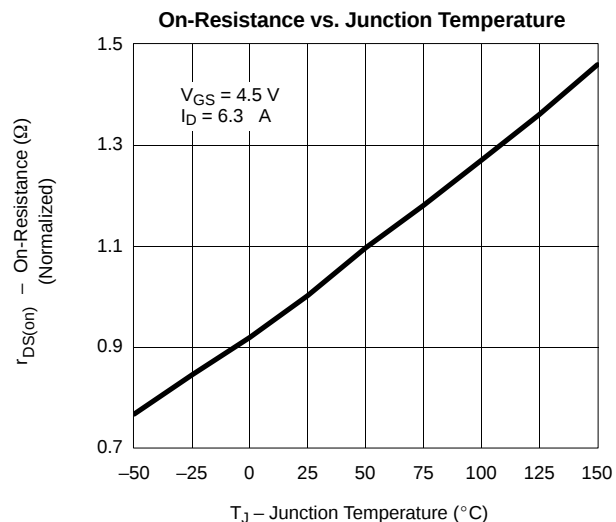
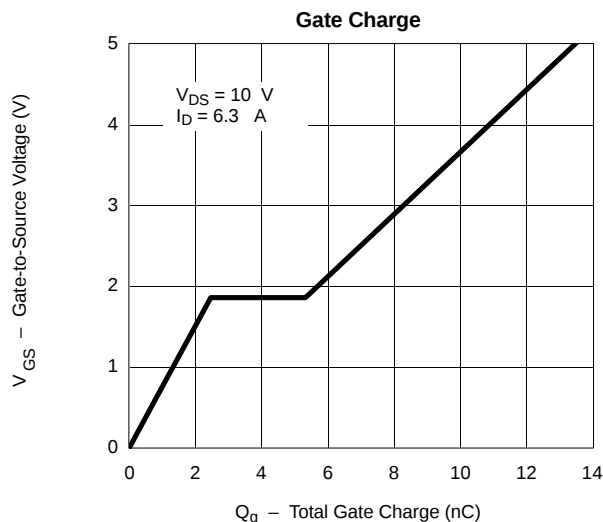
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET



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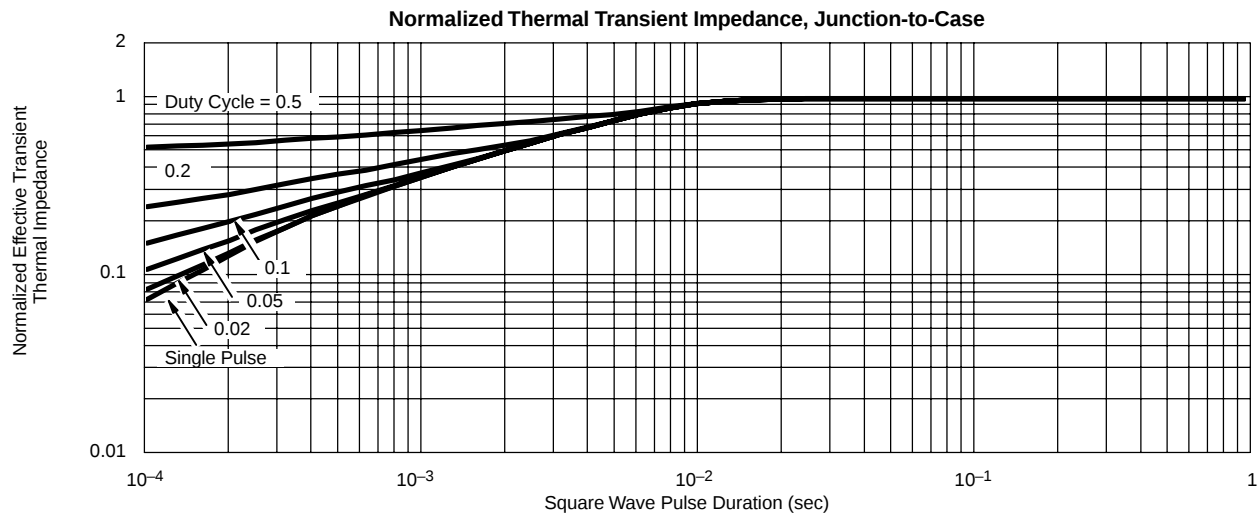
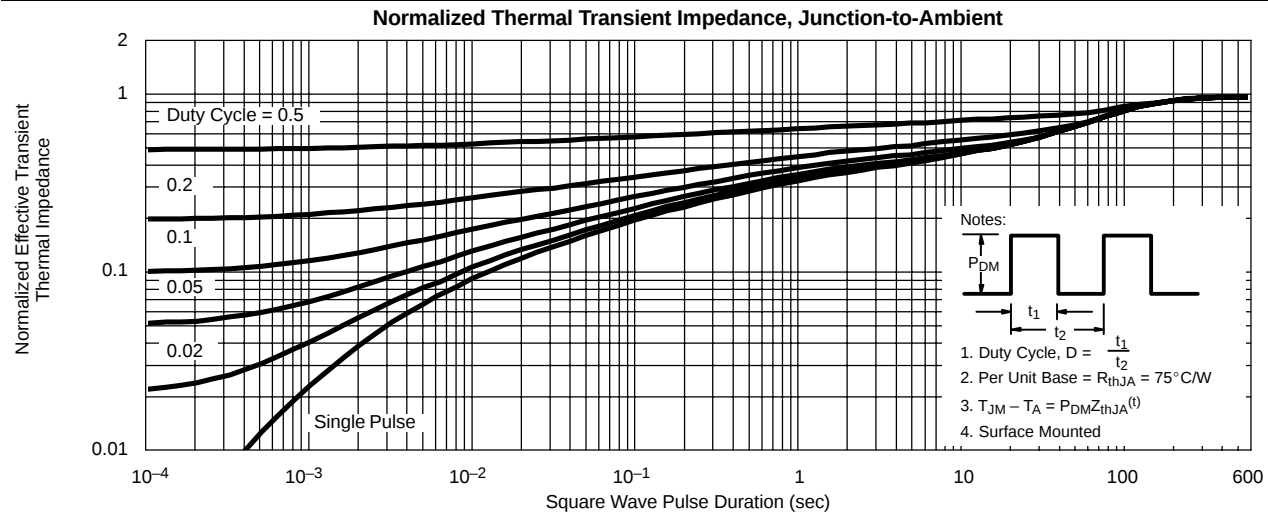
MOSFET





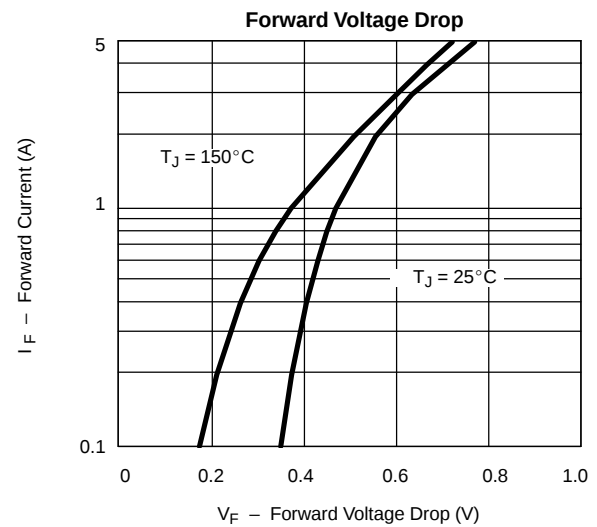
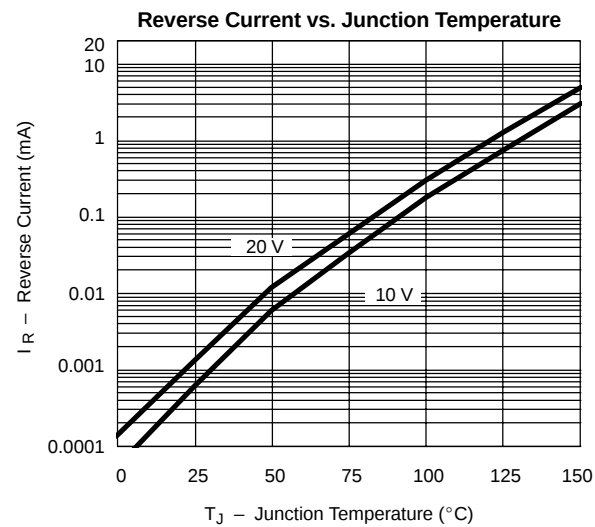
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

SCHOTTKY



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