



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

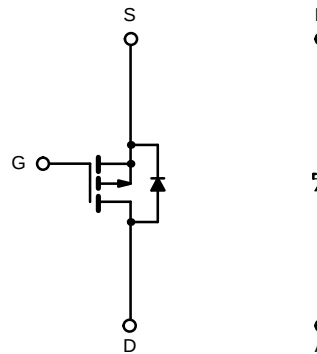
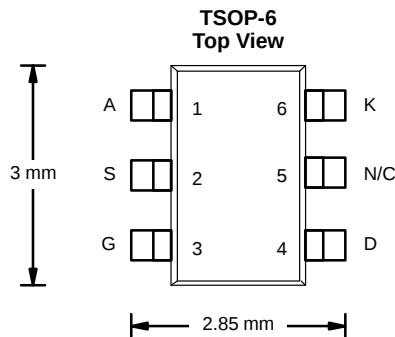
MOSFET PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-20	0.200 @ $V_{GS} = -4.5$ V	± 1.8
	0.340 @ $V_{GS} = -2.5$ V	± 1.3

SCHOTTKY PRODUCT SUMMARY

V_{KA} (V)	V_f (V) Diode Forward Voltage	I_F (A)
20	0.48 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}	−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	± 1.8	± 1.6	A
	$T_A = 70^{\circ}\text{C}$		± 1.5	± 1.2	
Pulsed Drain Current (MOSFET)		I_{DM}	± 7		
Continuous Source Current (MOSFET Diode Conduction) ^a		I_S	−1.05	−0.75	
Average Foward Current (Schottky)		I_F	0.5		
Pulsed Foward Current (Schottky)		I_{FM}	7		
Maximum Power Dissipation (MOSFET) ^a	$T_A = 25^{\circ}\text{C}$	P_D	1.15	0.83	W
	$T_A = 70^{\circ}\text{C}$		0.73	0.53	
Maximum Power Dissipation (Schottky) ^a	$T_A = 25^{\circ}\text{C}$		1.0	0.76	
	$T_A = 70^{\circ}\text{C}$		0.64	0.48	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 150		$^{\circ}\text{C}$

Notes

a. Surface Mounted on 1" x1" FR4 Board.

THERMAL RESISTANCE RATINGS						
Parameter		Device	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	$t \leq 5 \text{ sec}$	MOSFET	R_{thJA}	93	110	°C/W
		Schottky		103	125	
	Steady State	MOSFET		130	150	
		Schottky		140	165	
Junction-to-Foot	Steady State	MOSFET	R_{thJF}	75	90	
		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
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-0.5			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 12 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}$			-1	μA
		$V_{DS} = -16 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 75^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq -5 \text{ V}, V_{GS} = -4.5 \text{ V}$	-5			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -4.5 \text{ V}, I_D = -1.8 \text{ A}$		0.160	0.200	Ω
		$V_{GS} = -2.5 \text{ V}, I_D = -1.0 \text{ A}$		0.280	0.340	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5 \text{ V}, I_D = -1.8 \text{ A}$		3.6		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.05 \text{ A}, V_{GS} = 0 \text{ V}$		-0.83	-1.10	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -10 \text{ V}, V_{GS} = -4.5 \text{ V}, I_D = -1.8 \text{ A}$		2.7	4.0	nC
Gate-Source Charge	Q_{gs}			0.4		
Gate-Drain Charge	Q_{gd}			0.6		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -10 \text{ V}, R_L = 10 \Omega$ $I_D \approx -1 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_G = 6 \Omega$		11	17	ns
Rise Time	t_r			34	50	
Turn-Off Delay Time	$t_{d(off)}$			19	30	
Fall Time	t_f			24	36	
Source-Drain Reverse Recovery Time	t_{rr}			20	40	

Notes

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

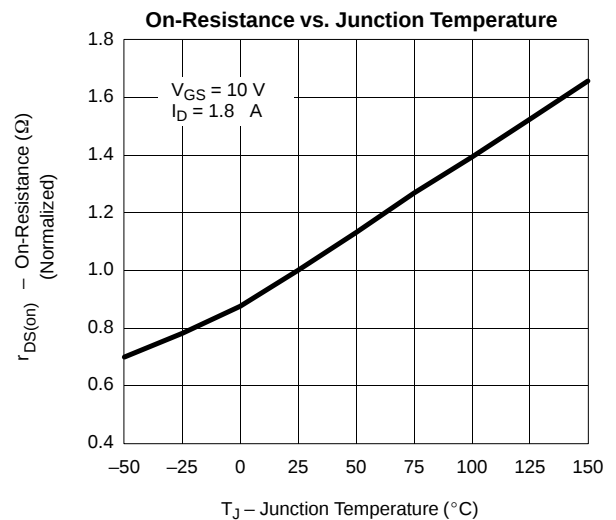
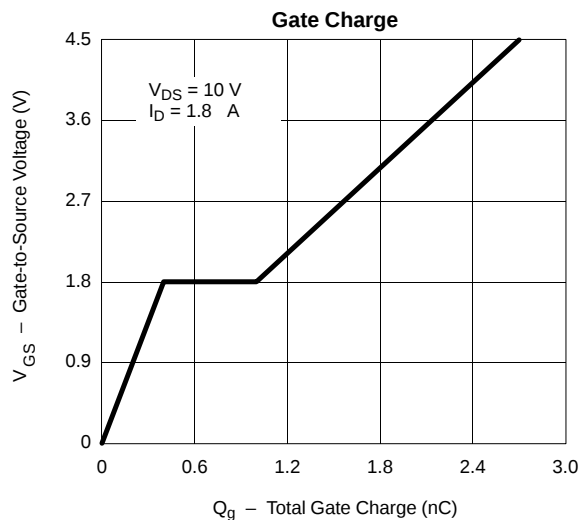
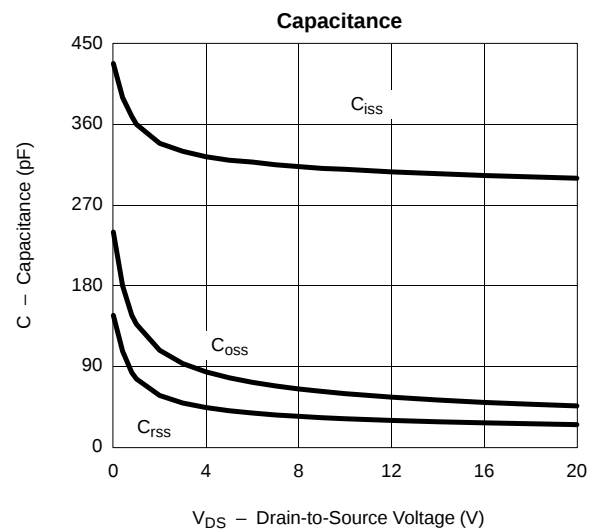
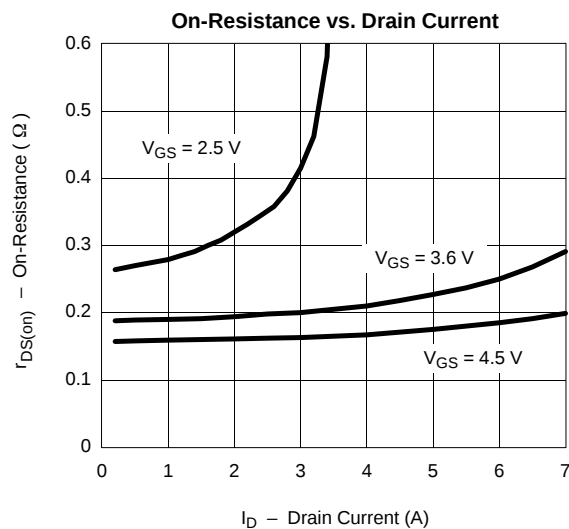
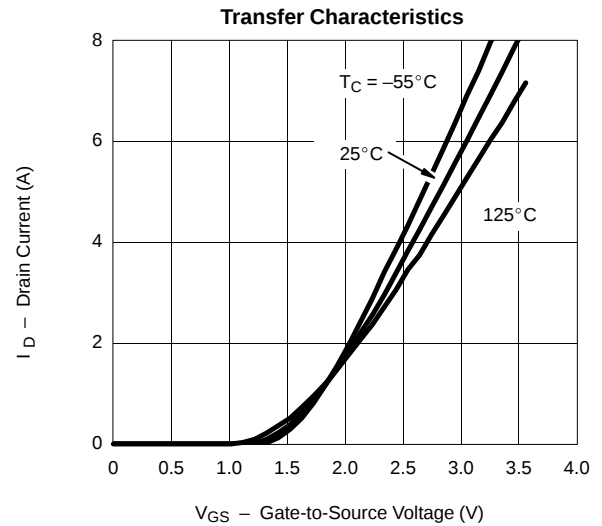
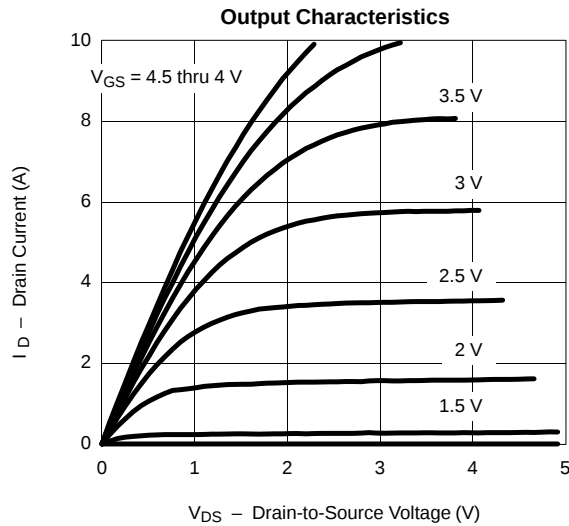
b. Guaranteed by design, not subject to production testing.

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
		$V_r = 20 \text{ V}, T_J = 75^\circ\text{C}$		0.06	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



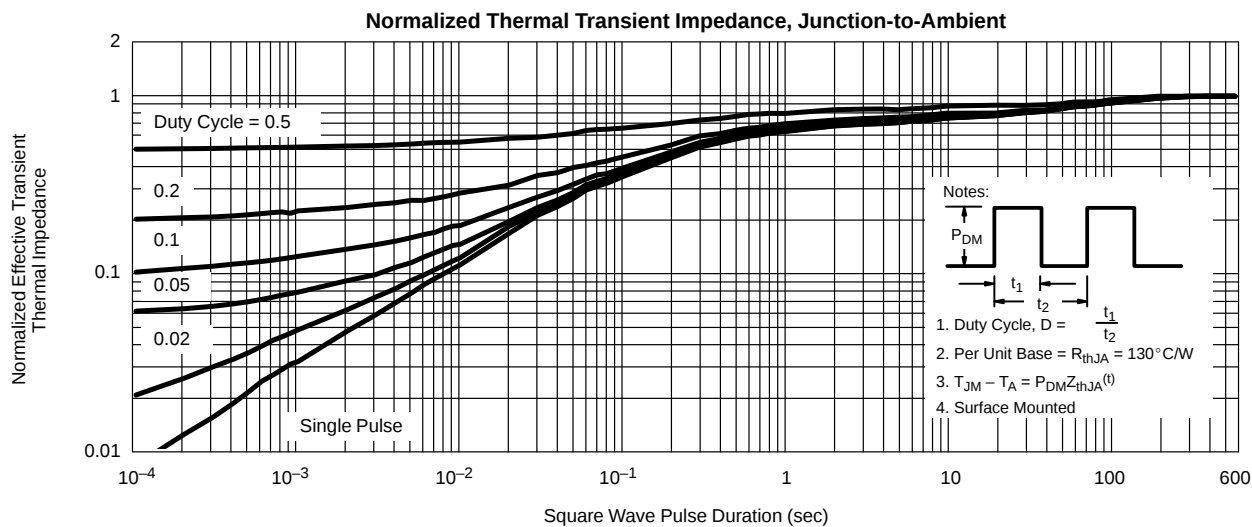
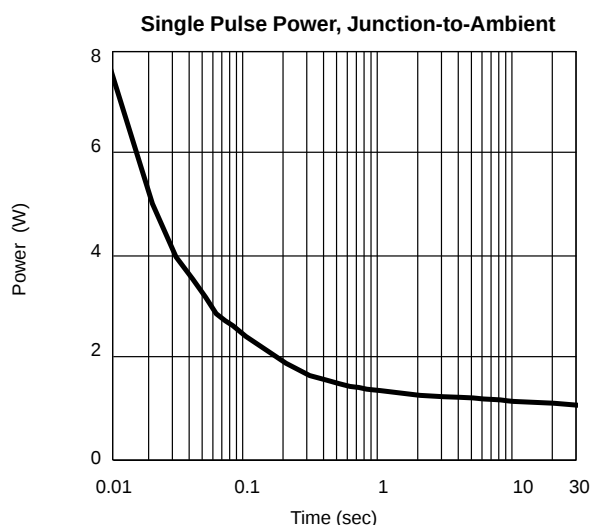
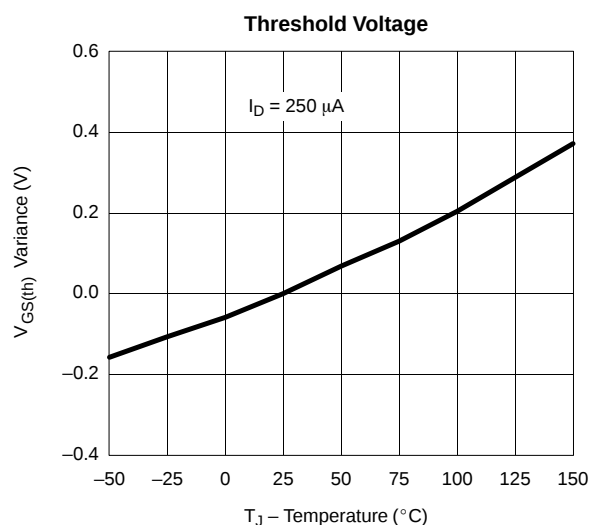
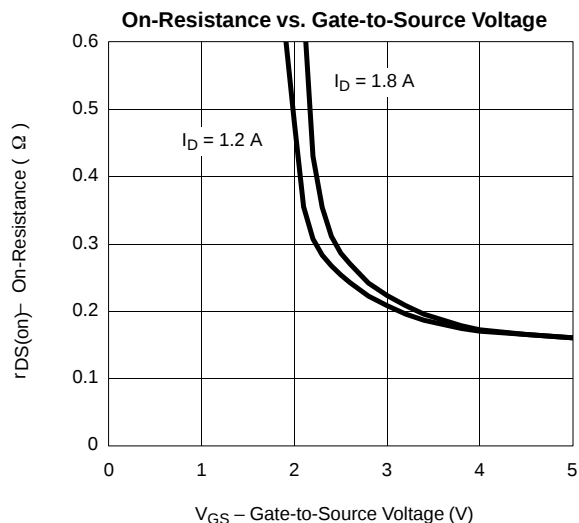
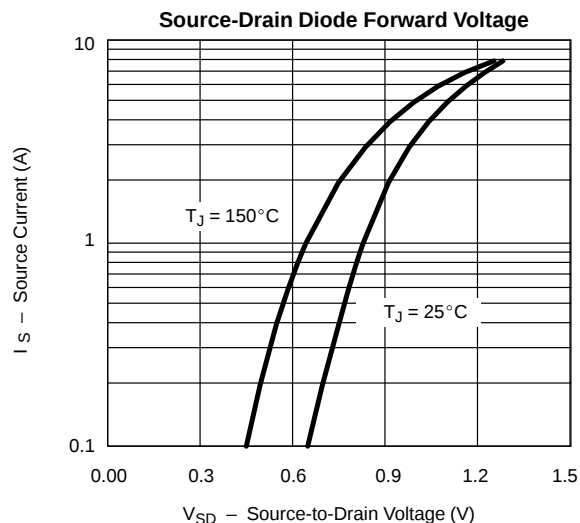
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MOSFET



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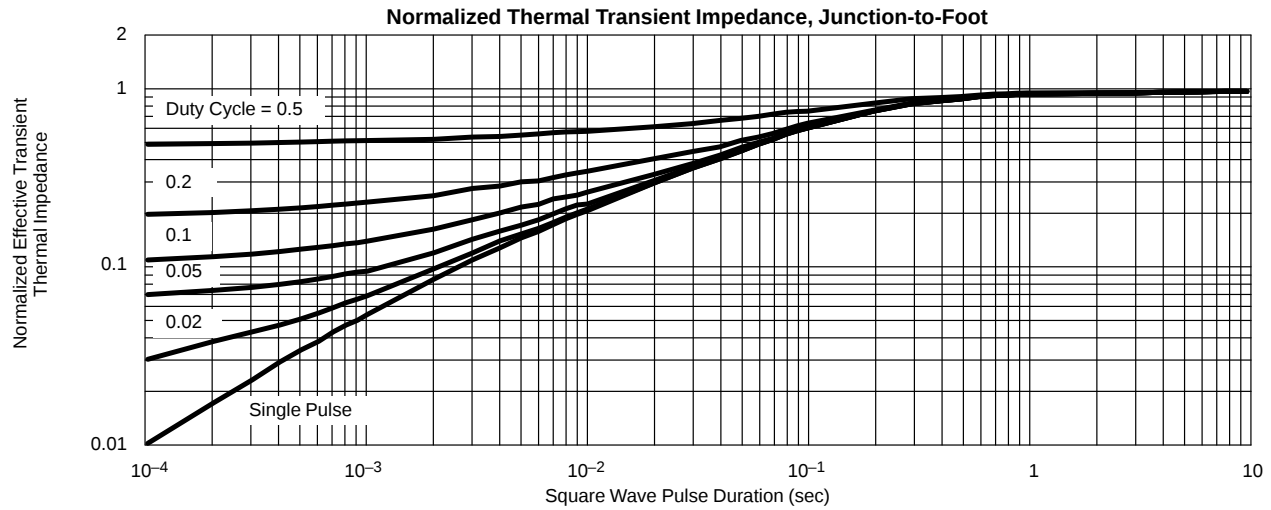
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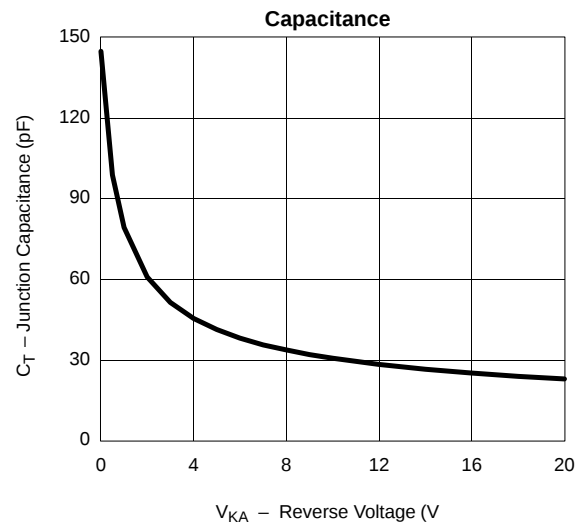
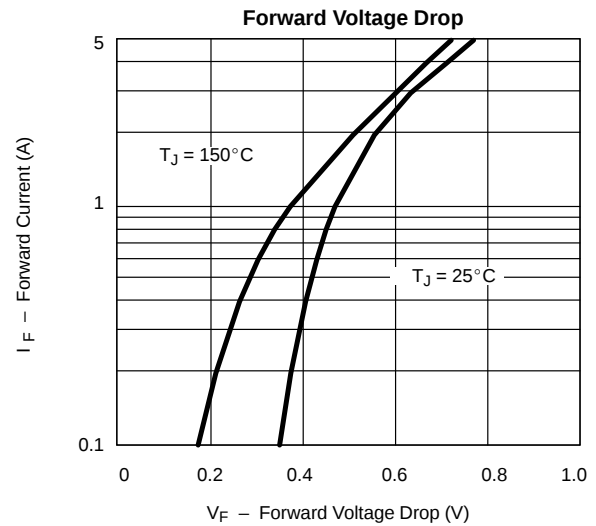
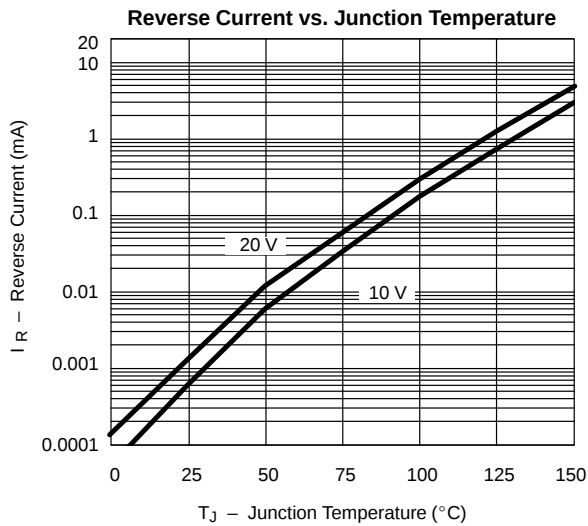
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