

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

MOSFET PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-30	0.020 @ $V_{GS} = -10$ V	8.3
	0.030 @ $V_{GS} = -4.5$ V	6.8

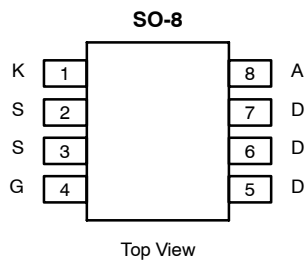
SCHOTTKY PRODUCT SUMMARY		
$V_{KA}$ (V)	$V_f$ (V) Diode Forward Voltage	$I_F$ (A)
30	0.53 V @ 3 A	3

### FEATURES

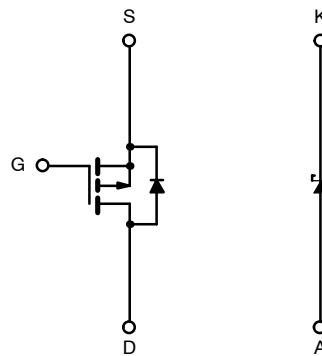
- TrenchFET® Power MOSFET
- LITTLE FOOT® Plus Schottky
- 100%  $R_g$  Tested

### APPLICATIONS

- Battery Charging
- DC/DC Converters
  - Asynchronous Buck
  - Voltage Inverter



Ordering Information: Si4837DY  
Si4837DY-T1 (with Tape and Reel)



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 Sec	Steady State	Unit
Drain-Source Voltage (MOSFET)		$V_{DS}$	-30		V
Reverse Voltage (Schottky)		$V_{KA}$	30		
Gate-Source Voltage (MOSFET)		$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 150^\circ\text{C}$ ) (MOSFET) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$	$I_D$	-8.3	-6.1	A
	$T_A = 70^\circ\text{C}$		-6.6	-4.9	
Pulsed Drain Current (MOSFET)		$I_{DM}$	-40		
Continuous Source Current (MOSFET Diode Conduction) <sup>a, b</sup>		$I_S$	-2.3	-1.25	
Average Forward Current (Schottky)		$I_F$	3		
Pulsed Forward Current (Schottky)		$I_{FM}$	20		
Maximum Power Dissipation (MOSFET) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$	$P_D$	2.5	1.38	W
	$T_A = 70^\circ\text{C}$		1.6	0.88	
Maximum Power Dissipation (Schottky) <sup>a, b</sup>	$T_A = 25^\circ\text{C}$		1.5	1.0	
	$T_A = 70^\circ\text{C}$		0.98	0.64	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 150		$^\circ\text{C}$

**Notes**

- a. Surface Mounted on FR4 Board.  
b.  $t \leq 10$  sec.

THERMAL RESISTANCE RATINGS					
Parameter	Device	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ( $t \leq 10$ sec) <sup>a</sup>	MOSFET	$R_{thJA}$	37	50	°C/W
	Schottky		65	81	
Maximum Junction-to-Ambient ( $t =$ steady state) <sup>a</sup>	MOSFET		70	90	
	Schottky		100	125	
Maximum Junction-to-Foot (Drain)	MOSFET	$R_{thJF}$	20	25	
	Schottky		50	62.5	

## Notes

- a. Surface Mounted on FR4 Board.  
b.  $t \leq 10$  sec.

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>	$I_{D(on)}$	$V_{DS} \geq -5 \text{ V}, V_{GS} = -10 \text{ V}$	-20			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10 \text{ V}, I_D = -8.3 \text{ A}$		0.0165	0.020	$\Omega$
		$V_{GS} = -4.5 \text{ V}, I_D = -6.8 \text{ A}$		0.0245	0.030	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15 \text{ V}, I_D = -8.3 \text{ A}$		22		S
Diode Forward Voltage <sup>a</sup>	$V_{SD}$	$I_S = -2.3 \text{ A}, V_{GS} = 0 \text{ V}$		-0.75	-1.1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	$Q_g$	$V_{DS} = -15 \text{ V}, V_{GS} = -5 \text{ V}, I_D = -8.3 \text{ A}$		22	33	nC
Gate-Source Charge	$Q_{gs}$		9			
Gate-Drain Charge	$Q_{gd}$		6.6			
Gate-Resistance	$R_g$		1	1.9	2	$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15 \text{ V}, R_L = 15 \Omega$ $I_D \cong -1 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 6 \Omega$		17	26	ns
Rise Time	$t_r$		15	23		
Turn-Off Delay Time	$t_{d(off)}$		56	85		
Fall Time	$t_f$		21	32		
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = -2.3 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$		45	70	

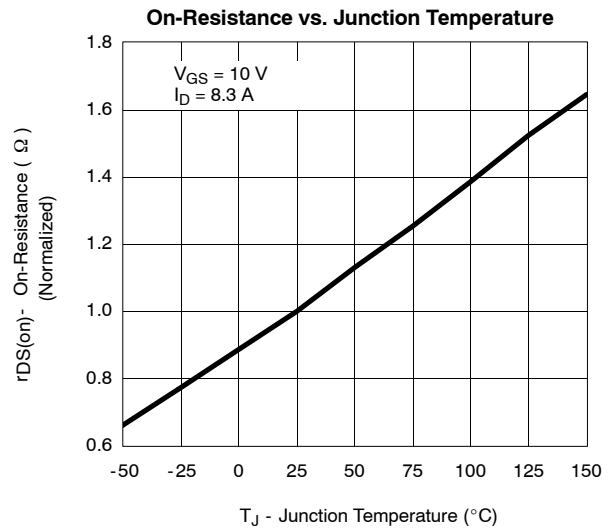
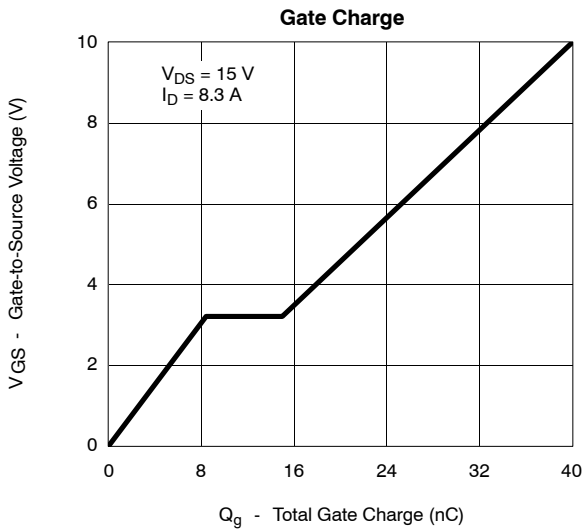
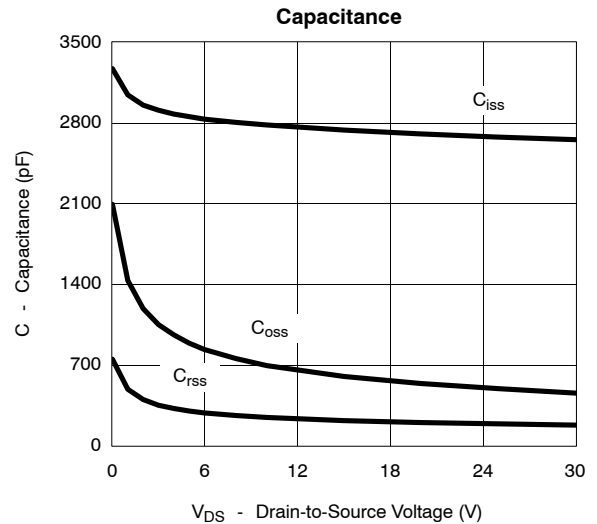
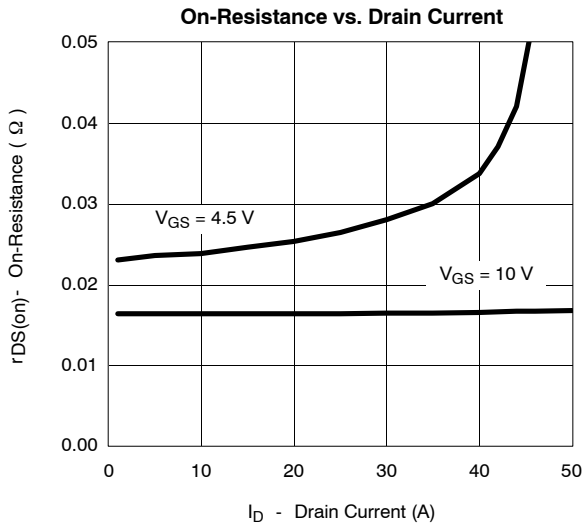
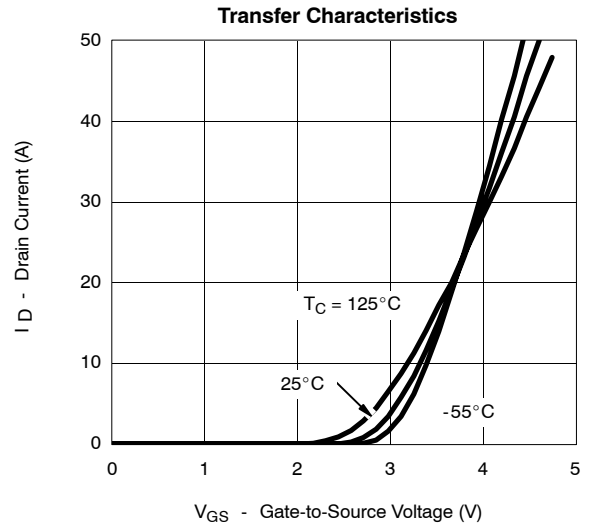
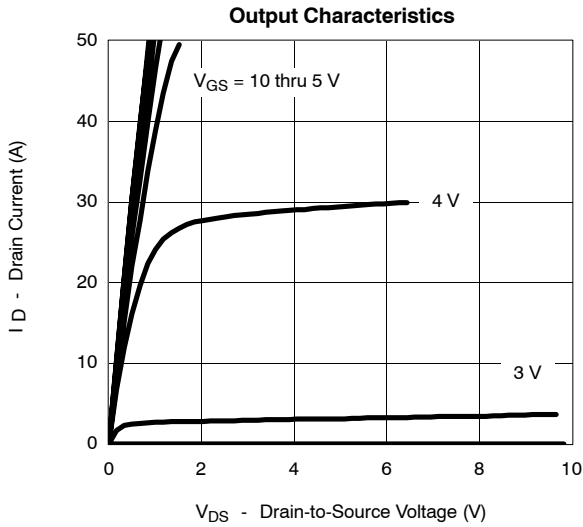
## Notes

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

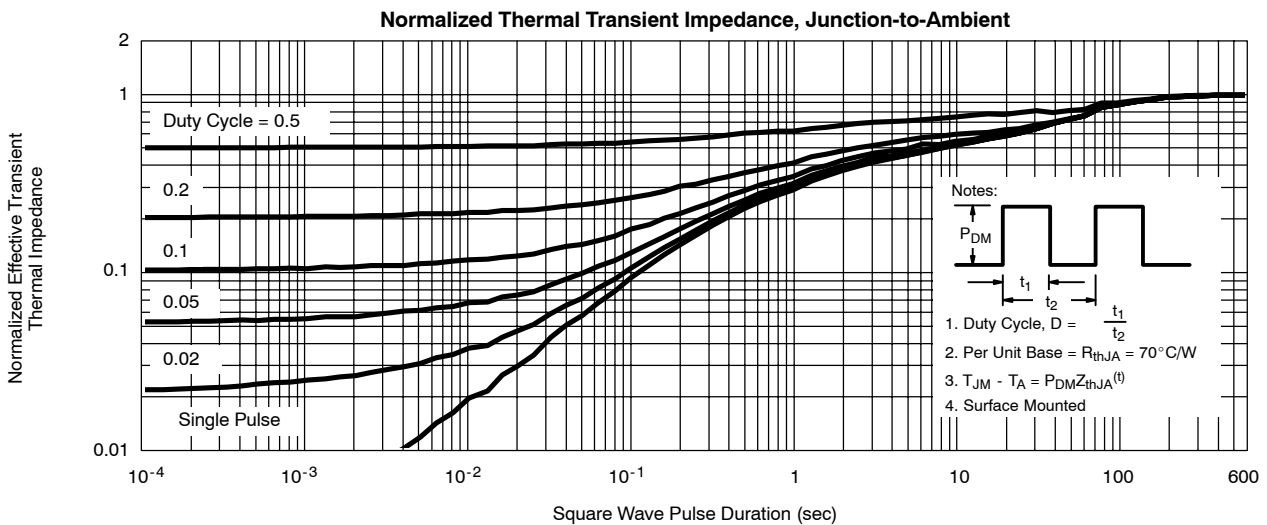
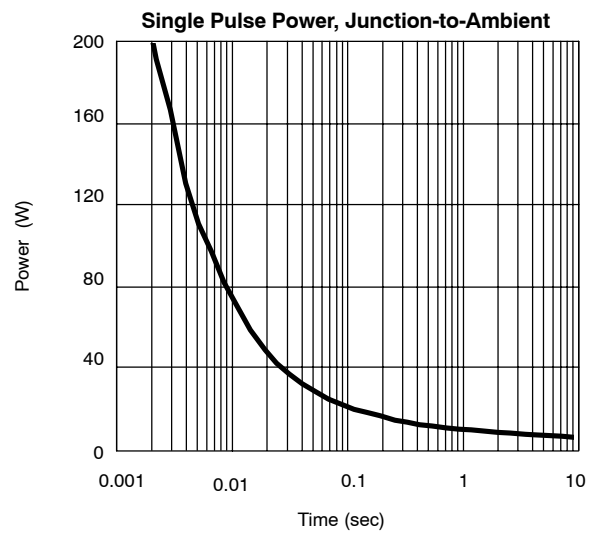
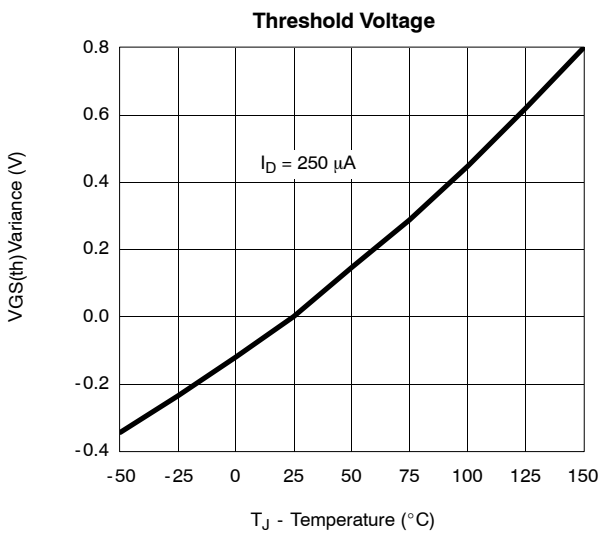
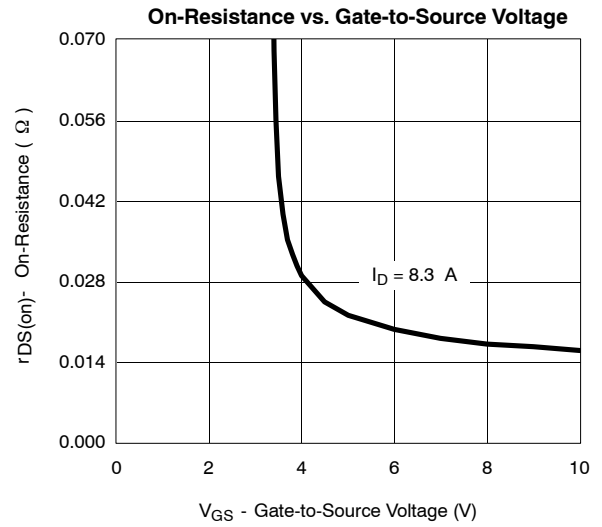
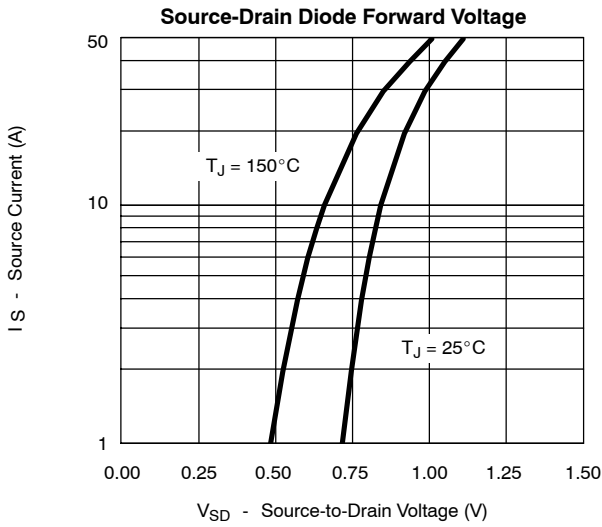
SCHOTTKY SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Forward Voltage Drop	$V_F$	$I_F = 3 \text{ A}$		0.485	0.53	V
		$I_F = 3 \text{ A}, T_J = 125^\circ\text{C}$		0.42	0.47	
Maximum Reverse Leakage Current	$I_{rm}$	$V_r = 30 \text{ V}$		0.008	0.1	mA
		$V_r = 30 \text{ V}, T_J = 75^\circ\text{C}$		0.4	5	
		$V_r = 30 \text{ V}, T_J = 125^\circ\text{C}$		6.5	20	
Junction Capacitance	$C_T$	$V_r = 15 \text{ V}$		102		pF



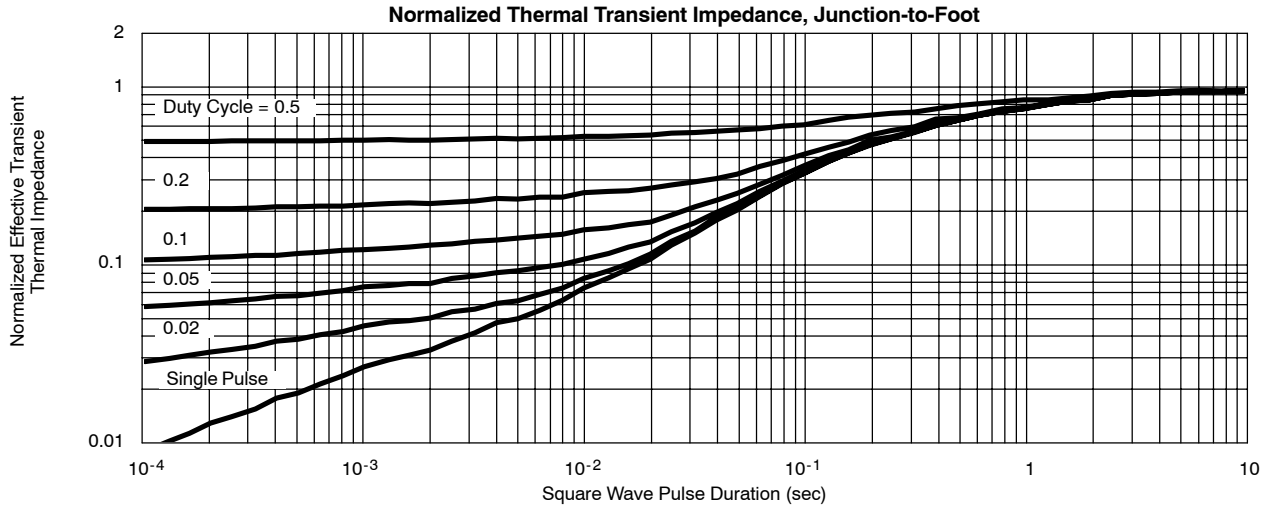
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) MOSFET**



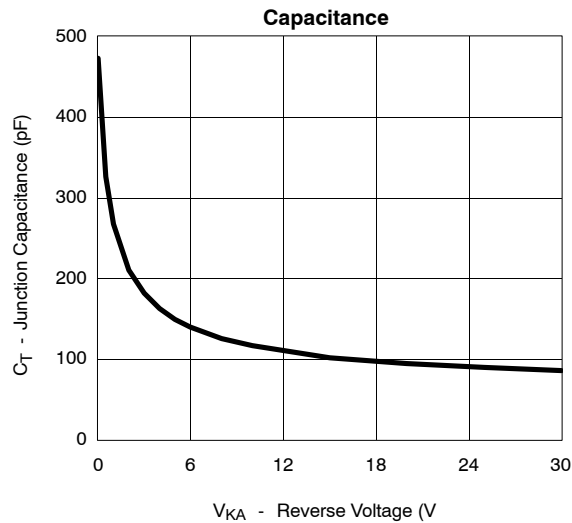
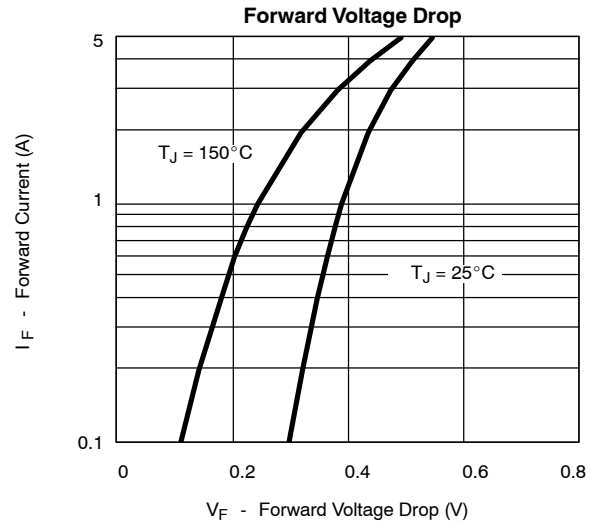
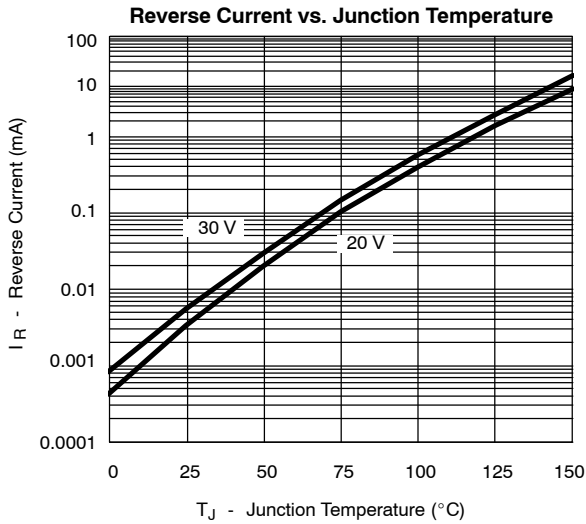
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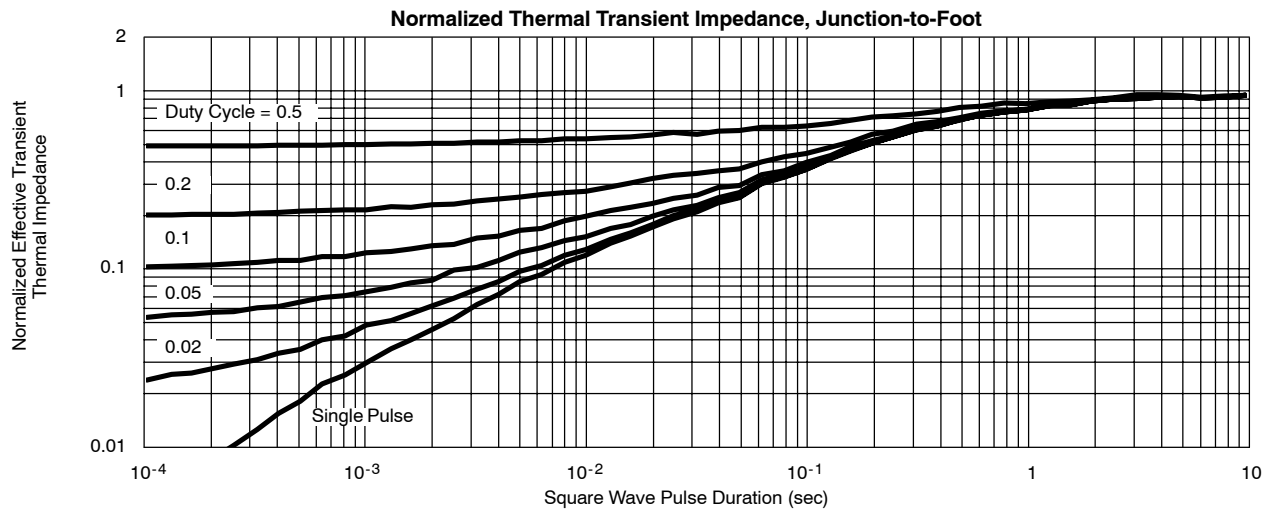
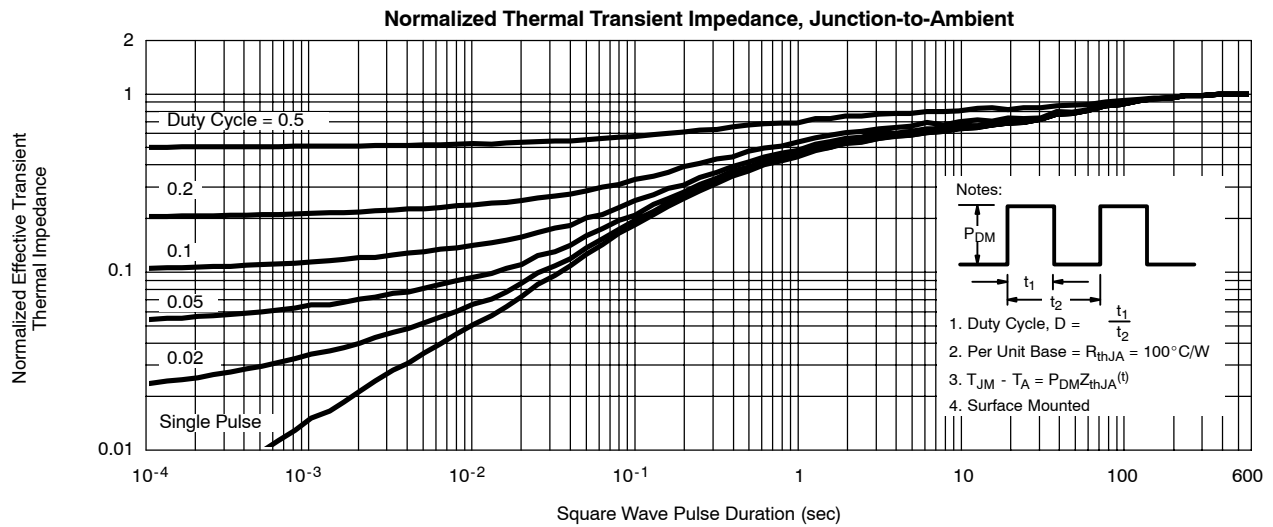
**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) SCHOTTKY**





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

**SCHOTTKY**





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