



**THE DATASHEET OF
SI4831DY-T1-E3**



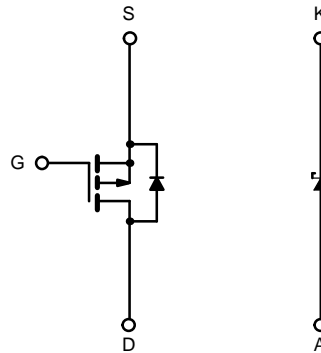
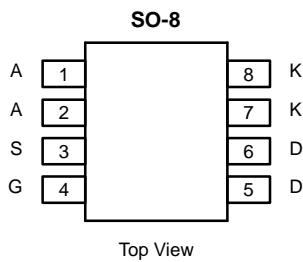


P-Channel 30-V (D-S) MOSFET with Schottky Diode

MOSFET PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.045 @ $V_{GS} = -10$ V	± 5
	0.090 @ $V_{GS} = -4.5$ V	± 3.5

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

LITTLE FOOT Plus™



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage (MOSFET)		V_{DS}	-30	V
Reverse Voltage (Schottky)		V_{KA}	30	
Gate-Source Voltage (MOSFET)		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) (MOSFET) ^{a, b}	$T_A = 25^\circ\text{C}$	I_D	± 5	A
	$T_A = 70^\circ\text{C}$		± 3.9	
Pulsed Drain Current (MOSFET)		I_{DM}	± 20	
Continuous Source Current (MOSFET Diode Conduction) ^{a, b}		I_S	-1.7	
Average Forward Current (Schottky)		I_F	3	
Pulsed Forward Current (Schottky)		I_{FM}	20	
Maximum Power Dissipation (MOSFET) ^{a, b}	$T_A = 25^\circ\text{C}$	P_D	2	W
	$T_A = 70^\circ\text{C}$		1.28	
Maximum Power Dissipation (Schottky) ^{a, b}	$T_A = 25^\circ\text{C}$		1.83	
	$T_A = 70^\circ\text{C}$		1.17	
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) ^a	MOSFET	R_{thJA}	52	62.5	°C/W
	Schottky		56	68	
Maximum Junction-to-Ambient ($t =$ steady state) ^a	MOSFET		82	100	
	Schottky		91	110	
Maximum Junction-to-Foot	MOSFET	R_{thJF}	27	33	
	Schottky		32	40	

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
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250 \mu\text{A}$	-1.0			V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}$			-1	μA
		$V_{DS} = -24 \text{ V}, V_{GS} = 0 \text{ V}, T_J = 75^\circ\text{C}$			-10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq -5 \text{ V}, V_{GS} = -10 \text{ V}$	-20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10 \text{ V}, I_D = -5 \text{ A}$		0.036	0.045	Ω
		$V_{GS} = -4.5 \text{ V}, I_D = -3.5 \text{ A}$		0.060	0.090	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15 \text{ V}, I_D = -5 \text{ A}$		9		S
Diode Forward Voltage ^a	V_{SD}	$I_S = -1.7 \text{ A}, V_{GS} = 0 \text{ V}$		-0.75	-1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = -15 \text{ V}, V_{GS} = -5 \text{ V}, I_D = -5 \text{ A}$		10	20	nC
Gate-Source Charge	Q_{gs}		4.5			
Gate-Drain Charge	Q_{gd}		3.6			
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15 \text{ V}, R_L = 15 \Omega$ $I_D \cong -1 \text{ A}, V_{GEN} = -10 \text{ V}, R_G = 6 \Omega$		13	25	ns
Rise Time	t_r		15	30		
Turn-Off Delay Time	$t_{d(off)}$		37	70		
Fall Time	t_f		14	30		
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = -1.7 \text{ A}, di/dt = 100 \text{ A}/\mu\text{s}$		35	70	

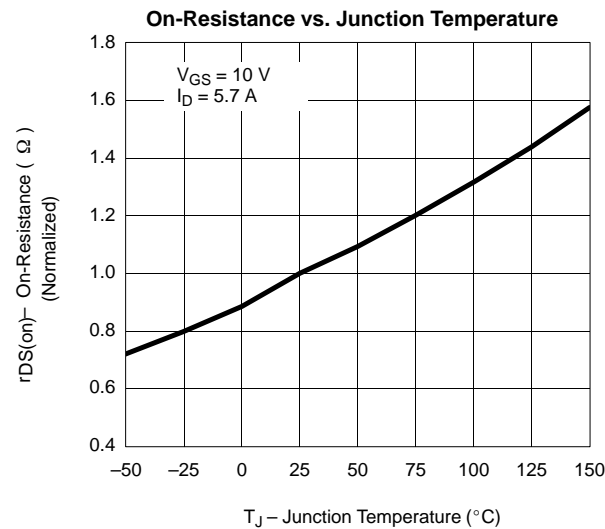
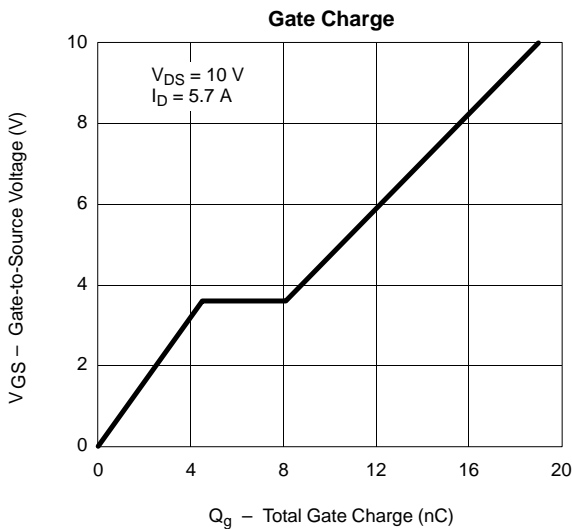
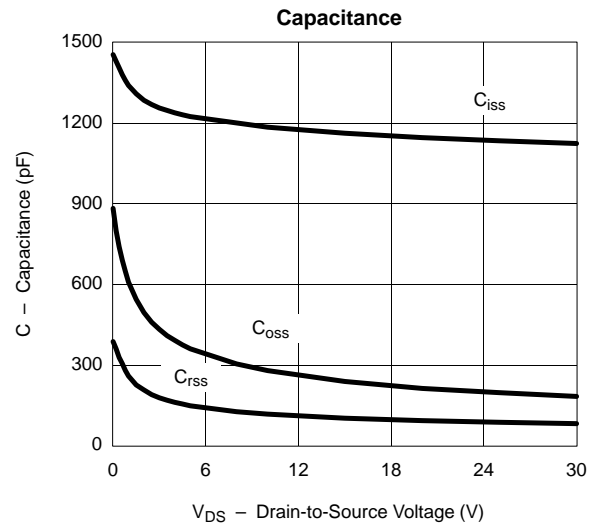
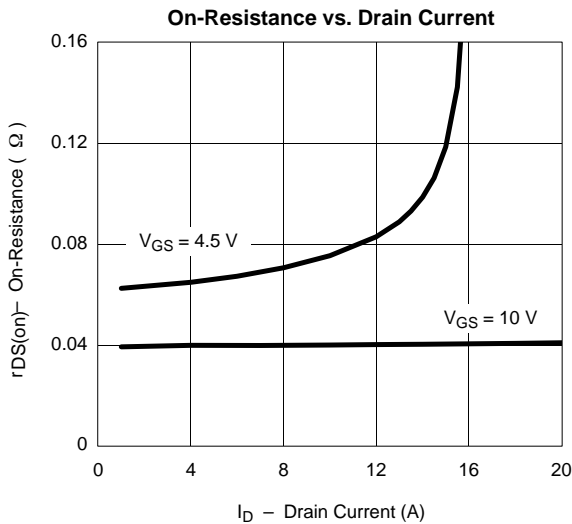
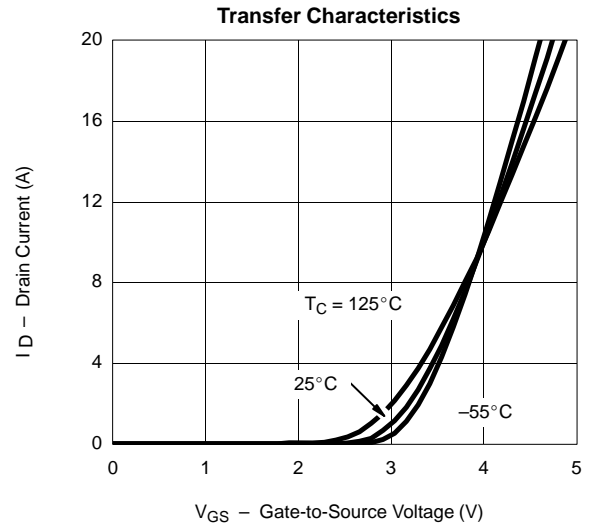
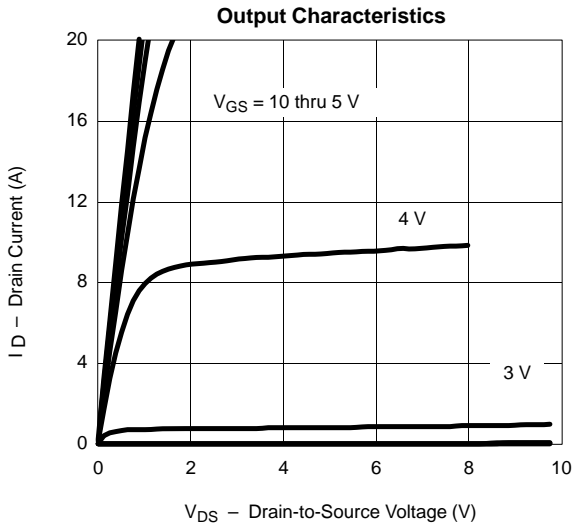
Notes

- 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	
Junction Capacitance	C_T	$V_r = 30 \text{ V}, T_J = 125^\circ\text{C}$		6.5	20	pF
		$V_r = 15 \text{ V}$		102		



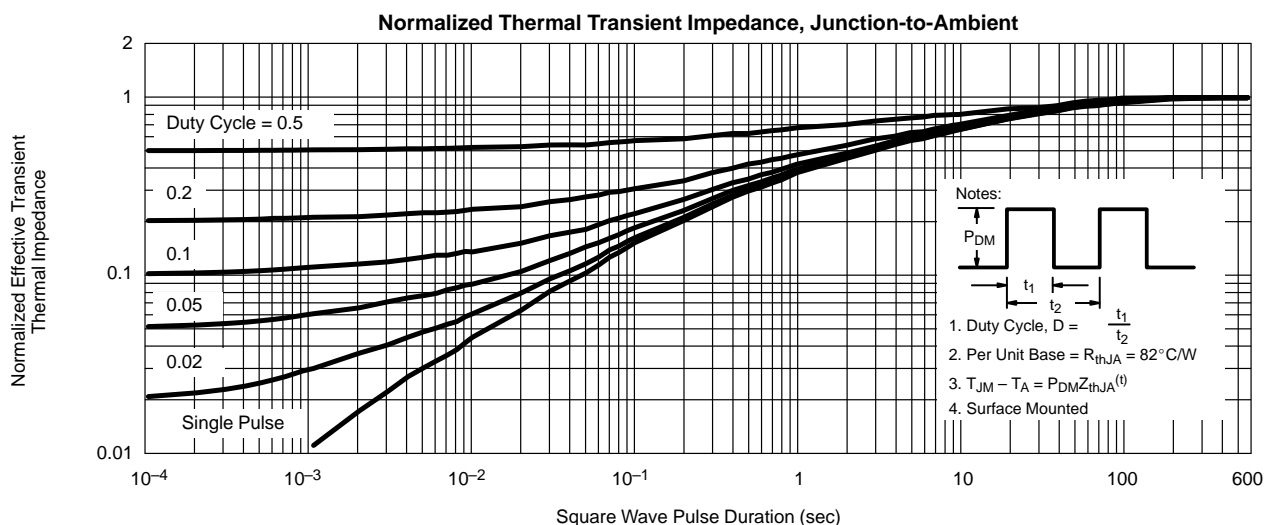
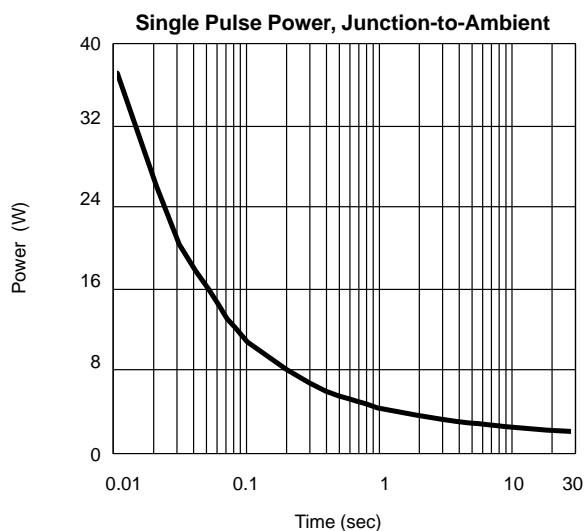
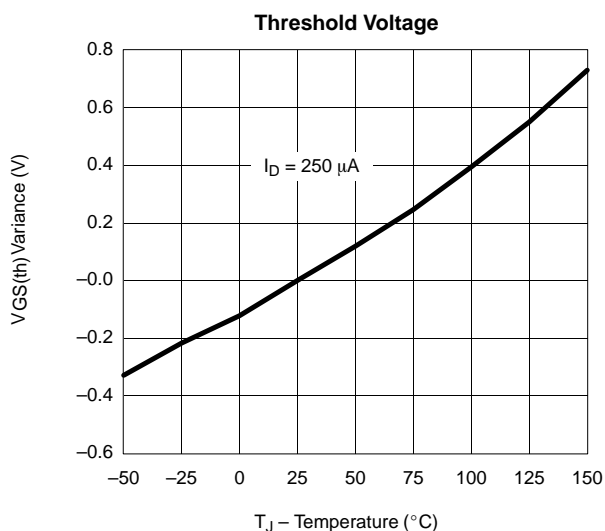
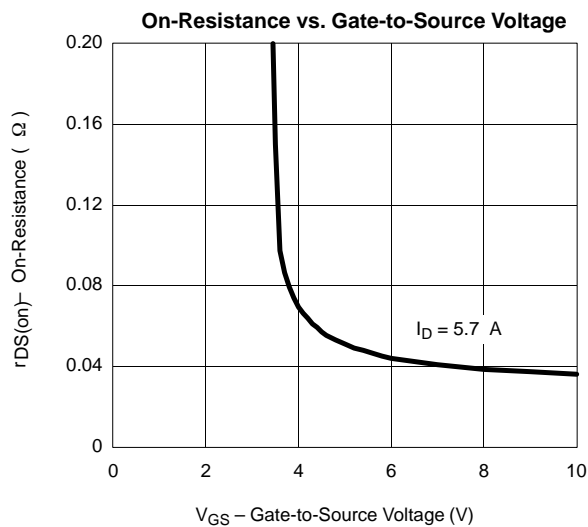
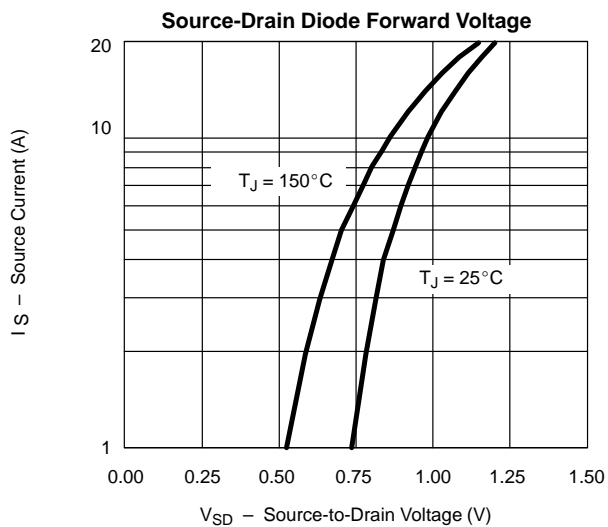
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) **MOSFET**





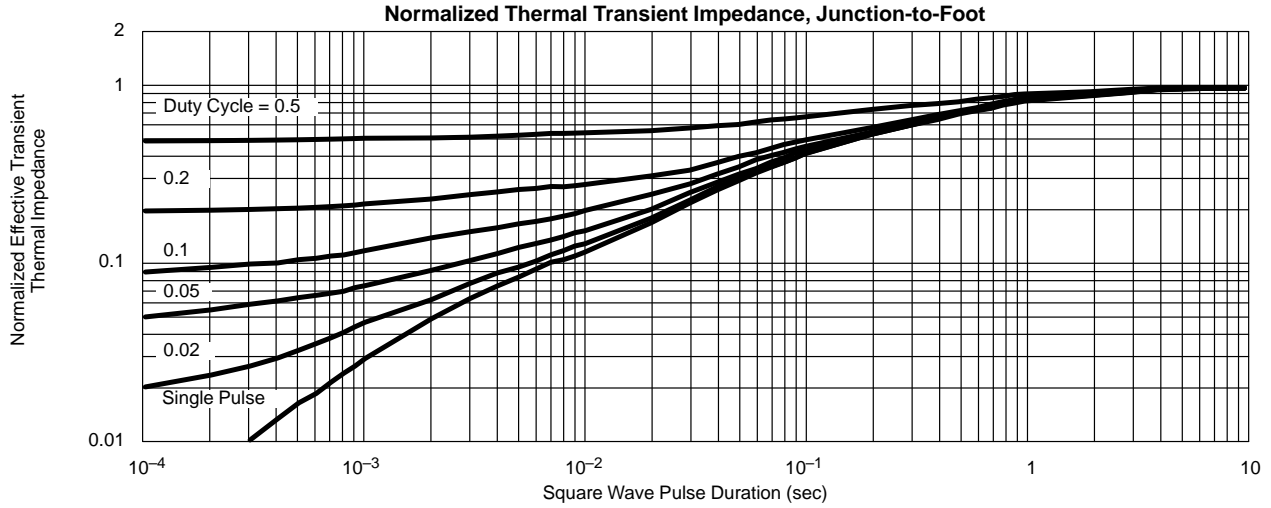
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

MOSFET

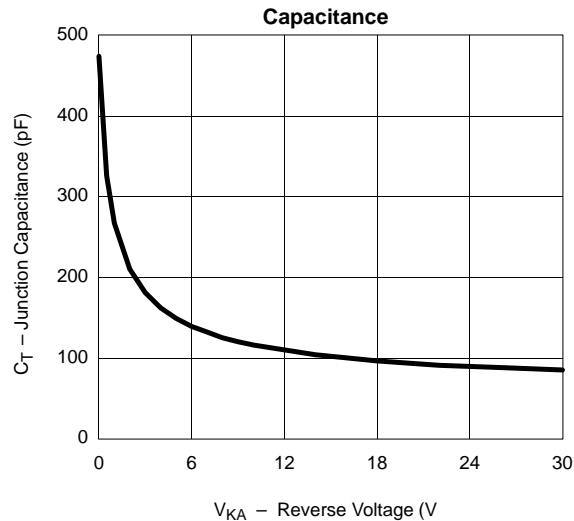
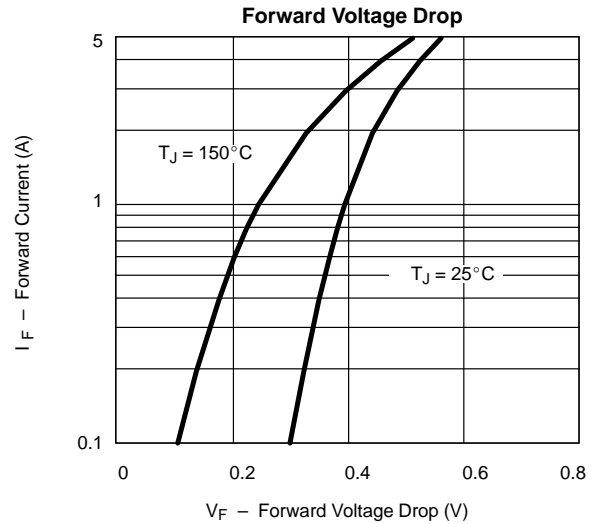
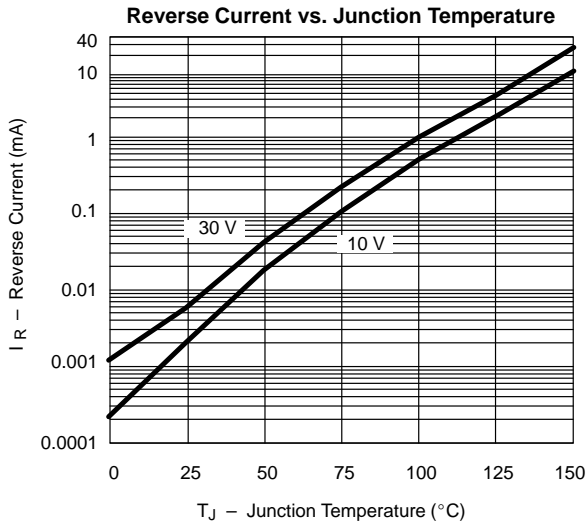




TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) MOSFET

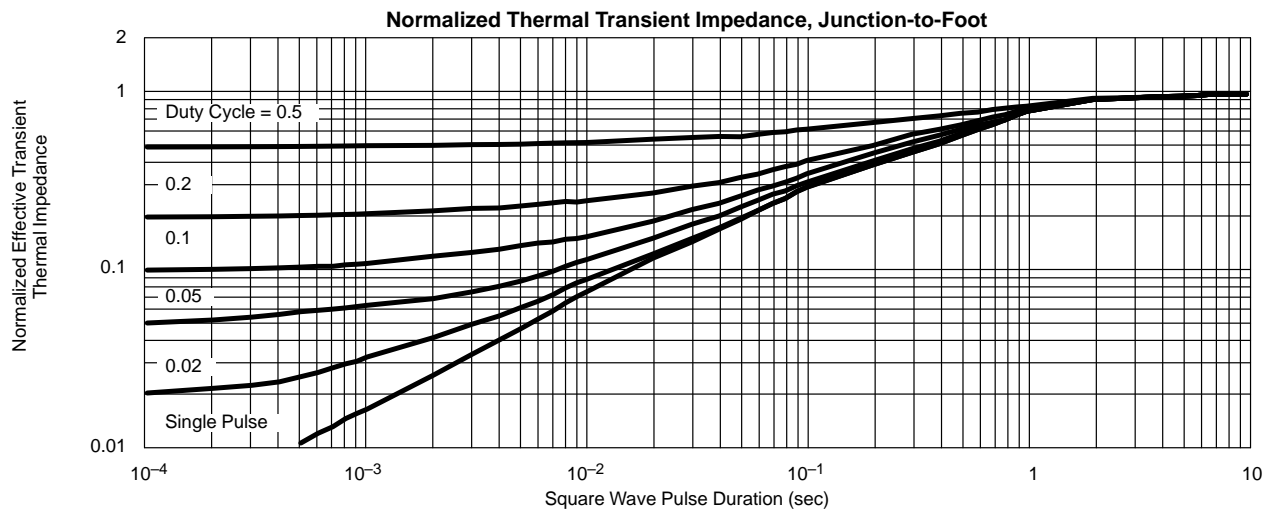
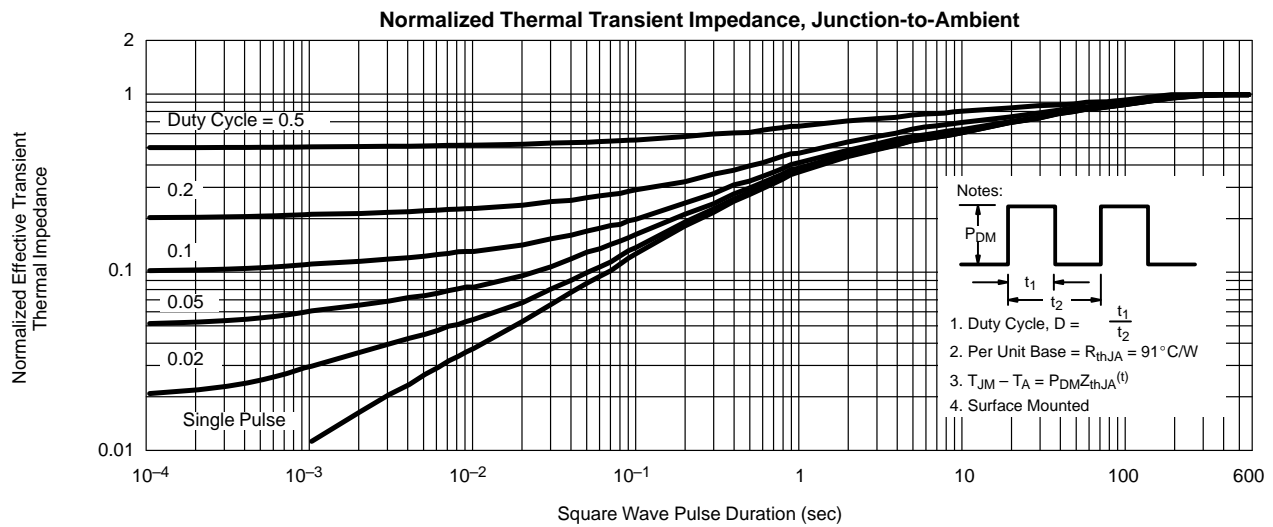


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) SCHOTTKY





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED) SCHOTTKY





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