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

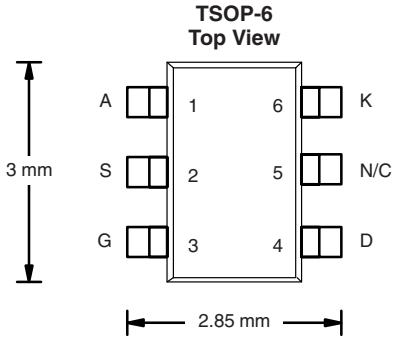
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
- 30	0.200 at V_{GS} = - 10 V	± 1.8
	0.360 at V_{GS} = - 4.5 V	± 1.2

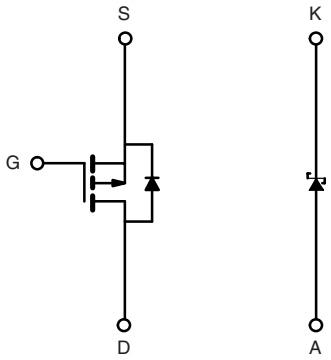
SCHOTTKY PRODUCT SUMMARY		
V_{KA} (V)	V_F (V) Diode Forward Voltage	I_F (A)
30	0.5 V at 0.5 A	0.5

FEATURES

- **Halogen-free According to IEC 61249-2-21 Definition**
- LITTLE FOOT® *Plus*
- Compliant to RoHS Directive 2002/95/EC

Pb-free
RoHS COMPLIANT
HALOGEN FREE Available





P-Channel MOSFET

Ordering Information: Si3851DV-T1-E3 (Lead (Pb)-free)
Si3851DV-T1-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted

Parameter		Symbol	5 s	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}	± 20	± 20	
Continuous Drain Current (T_J = 150 °C) (MOSFET)[a]	T_A = 25 °C	I_D	± 1.8	± 1.6	A
	T_A = 70 °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 Forward Current (Schottky)		I_F	0.5		
Pulsed Foward Current (Schottky)		I_{FM}	7		
Maximum Power Dissipation (MOSFET)[a]	T_A = 25 °C	P_D	1.15	0.83	W
	T_A = 70 °C		0.73	0.53	
Maximum Power Dissipation (Schottky)[a]	T_A = 25 °C		1.0	0.76	
	T_A = 70 °C		0.64	0.48	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150		°C

Notes:
a. Surface mounted on 1" x 1" FR4 board.

THERMAL RESISTANCE RATINGS

Parameter		Device	Symbol	Typical	Maximum	Unit
Junction-to-Ambient	t ≤ 5 s	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	

MOSFET SPECIFICATIONS T_J = 25 °C, unless otherwise noted

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = - 250 µA	- 1			V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = - 24 V, V_{GS} = 0 V			- 1	µA
		V_{DS} = - 24 V, V_{GS} = 0 V, T_J = 75 °C			- 10	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ - 5 V, V_{GS} = - 10 V	- 5			A
Drain-Source On-State Resistance[a]	$R_{DS(on)}$	V_{GS} = - 10 V, I_D = - 1.8 A		0.165	0.200	Ω
		V_{GS} = - 4.5 V, I_D = - 1.2 A		0.298	0.360	
Forward Transconductance[a]	g_{fs}	V_{DS} = - 15 V, I_D = - 1.8 A		2.4		S
Diode Forward Voltage[a]	V_{SD}	I_S = - 1.05 V, V_{GS} = 0 V		- 0.83	- 1.10	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = - 15 V, V_{GS} = - 5 V, I_D = - 1.8 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 V, R_L = 15 Ω I_D ≅ - 1 A, V_{GEN} = - 10 V, R_g = 6 Ω		8	12	ns
Rise Time	t_r			12	18	
Turn-Off DelayTime	$t_{d(off)}$			12	18	
Fall Time	t_f			7	11	
Body Diode Reverse Recovery Time	t_{rr}	I_F = - 1.05 A, dI/dt = 100 A/µs		30	60	

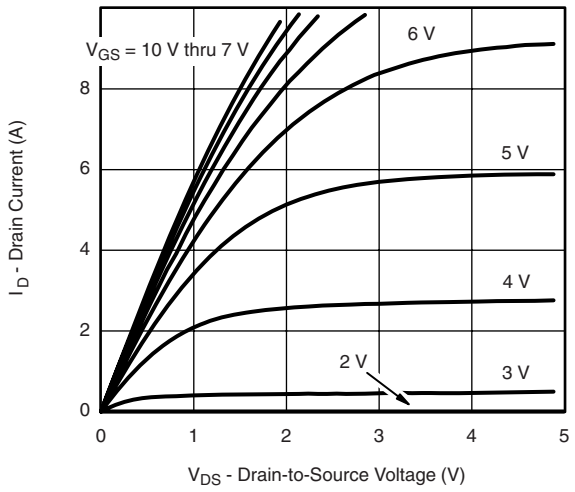
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.

SCHOTTKY SPECIFICATIONS T_J = 25 °C, unless otherwise noted

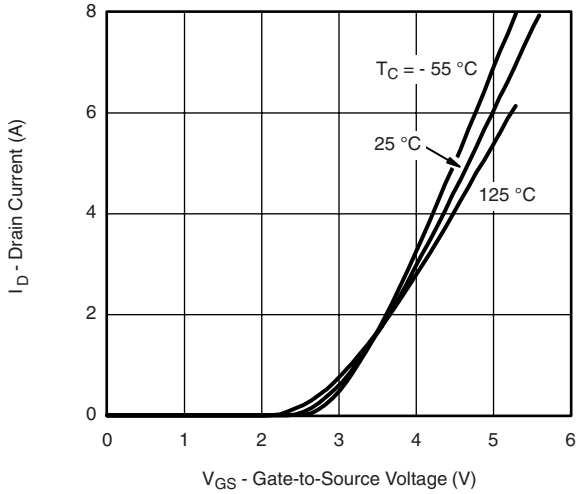
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Forward Voltage Drop	V_F	I_F = 0.5 A		0.45	0.5	V
		I_F = 0.5 A, T_J = 125 °C		0.35	0.4	
Maximum Reverse Leakage Current	I_{rm}	V_R = 30 V		0.002	0.100	mA
		V_R = 30 V, T_J = 75 °C		0.06	1	
		V_R = 30 V, T_J = 125 °C		1.5	10	
Junction Capacitance	C_T	V_R = 10 V		24		pF

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

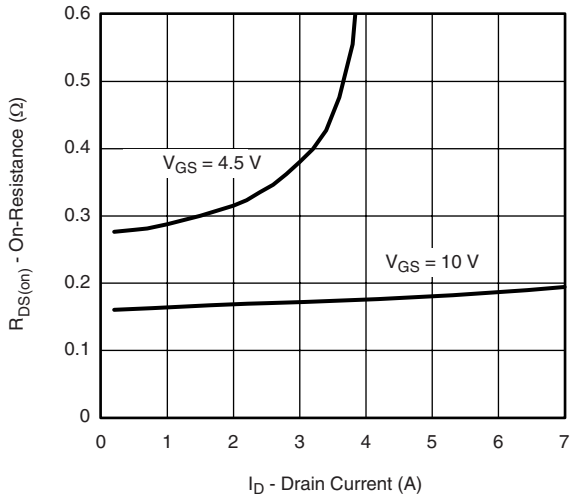
MOSFET TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



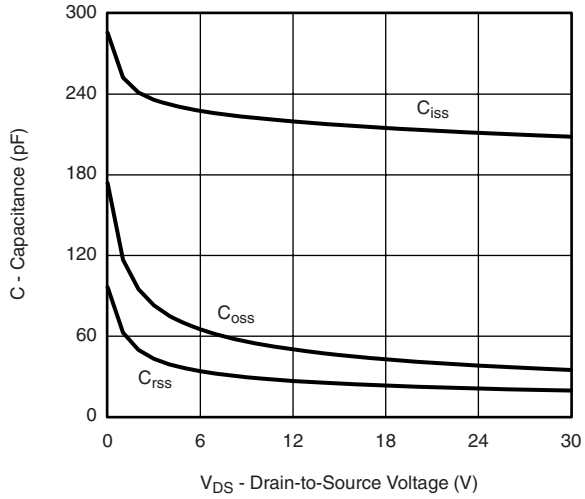
Output Characteristics



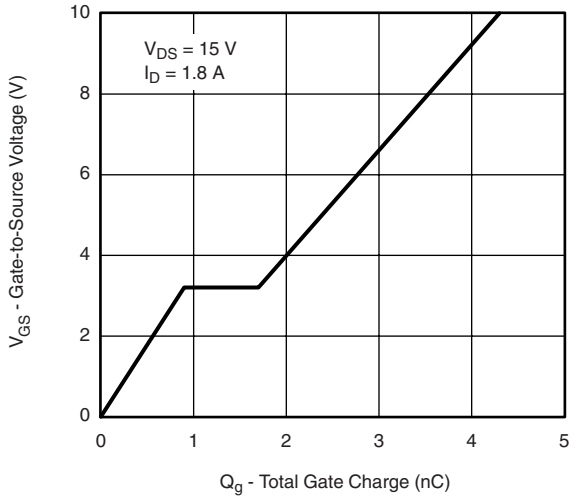
Transfer Characteristics



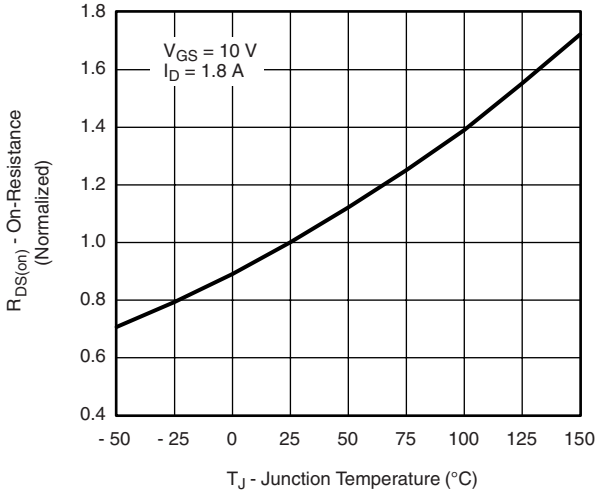
On-Resistance vs. Drain Current



Capacitance

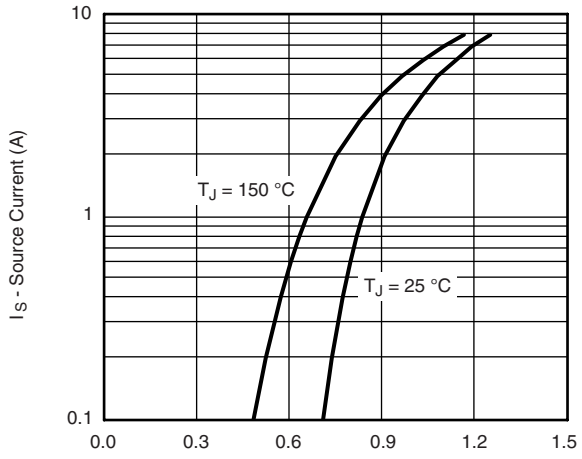


Gate Charge

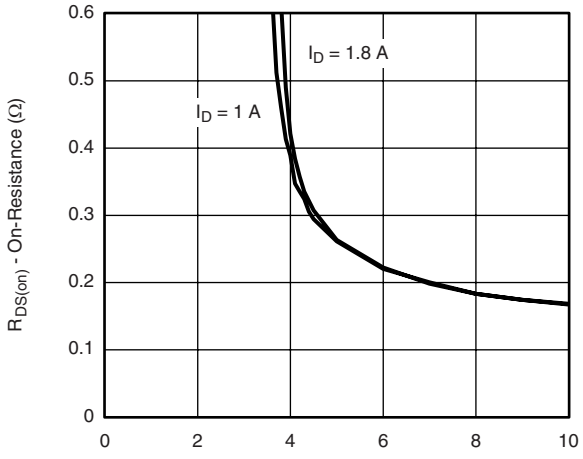


On-Resistance vs. Junction Temperature

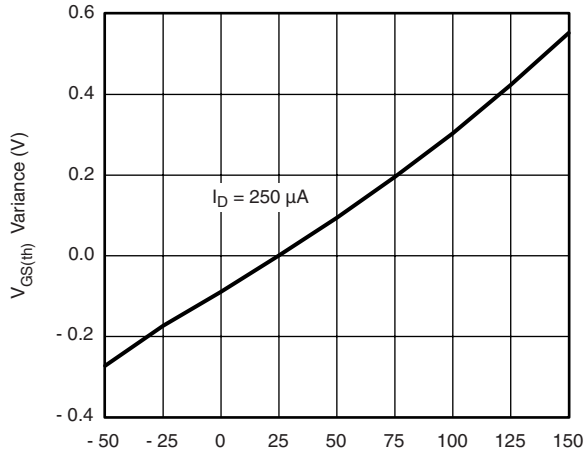
MOSFET TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



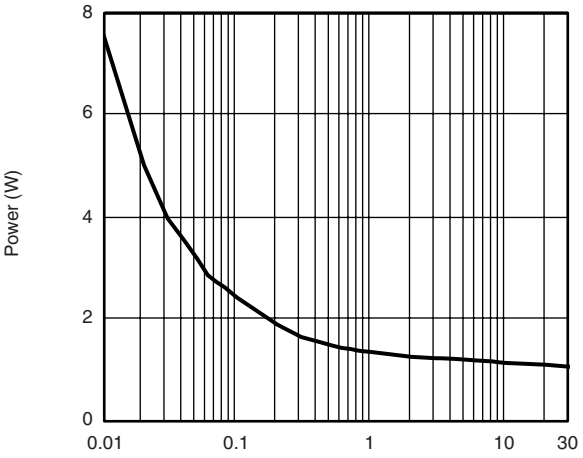
Source-Drain Diode Forward Voltage



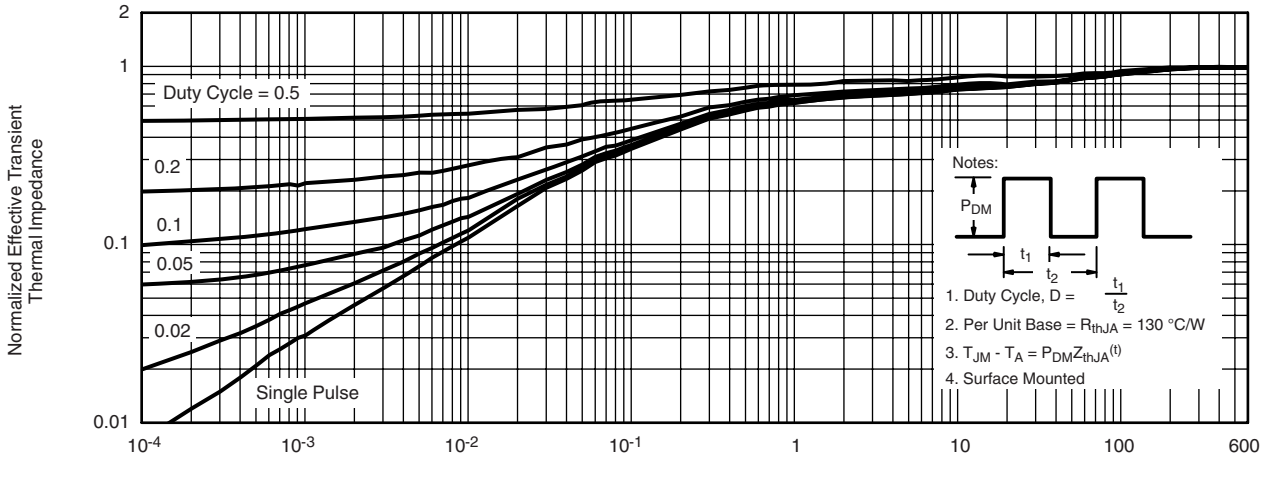
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

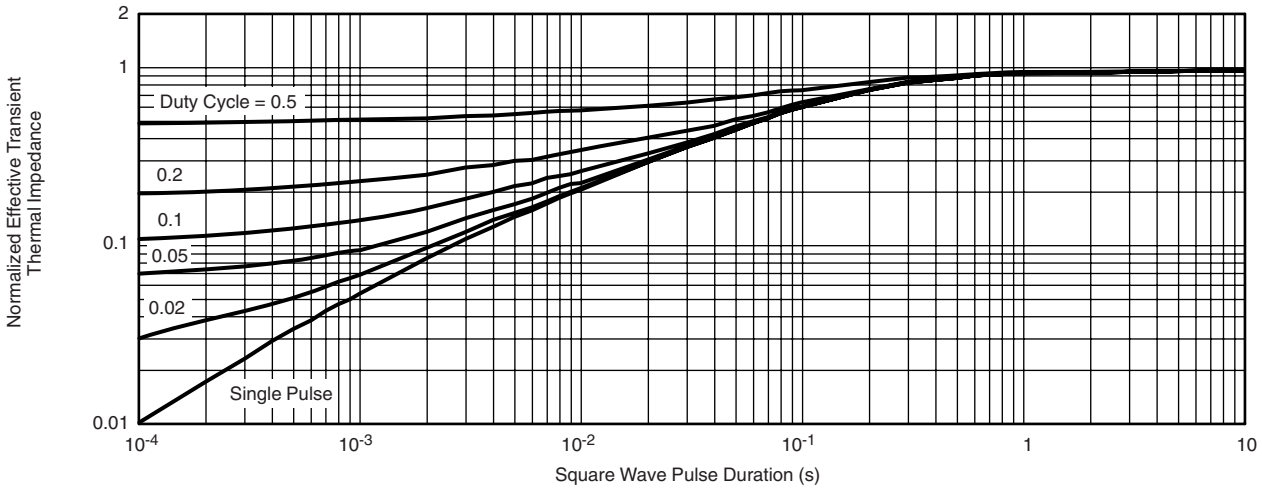


Single Pulse Power, Junction-to-Ambient



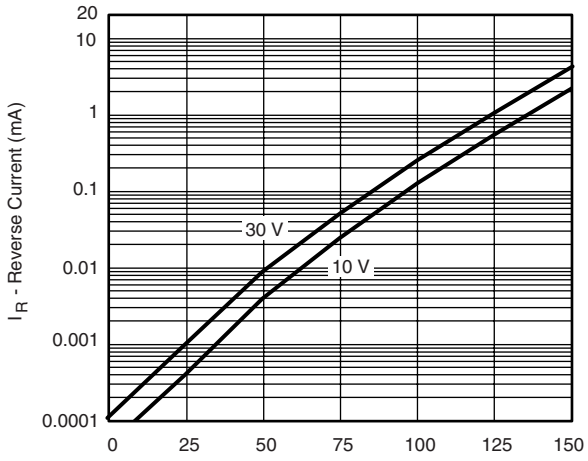
Normalized Thermal Transient Impedance, Junction-to-Ambient

MOSFET TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted

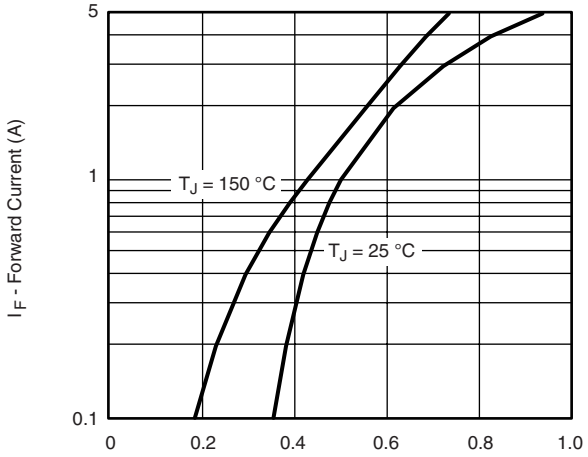


Normalized Thermal Transient Impedance, Junction-to-Foot

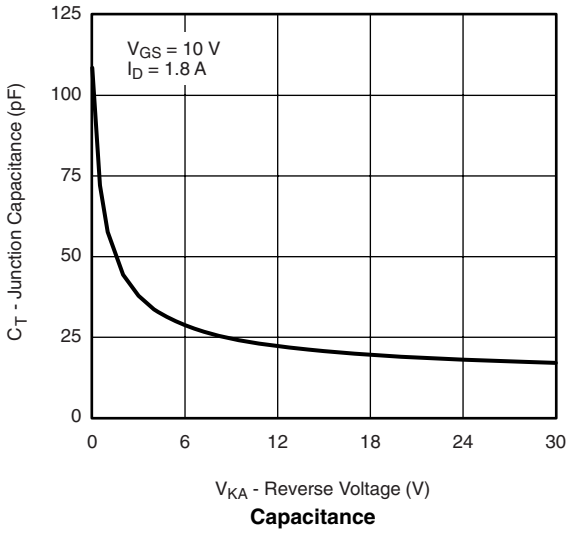
SCHOTTKY TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



Reverse Current vs. Junction Temperature

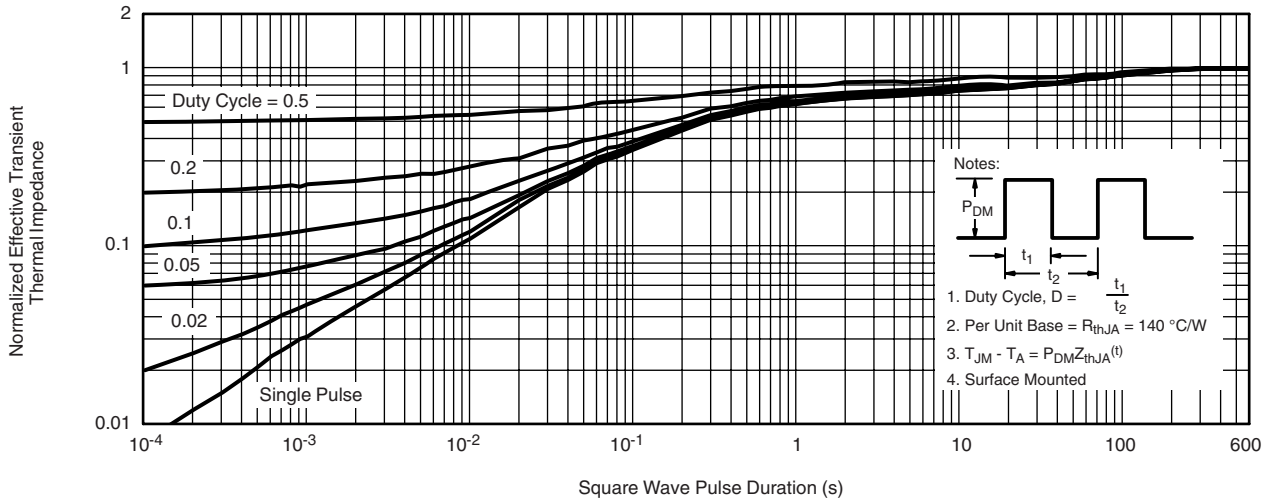


Forward Voltage Drop

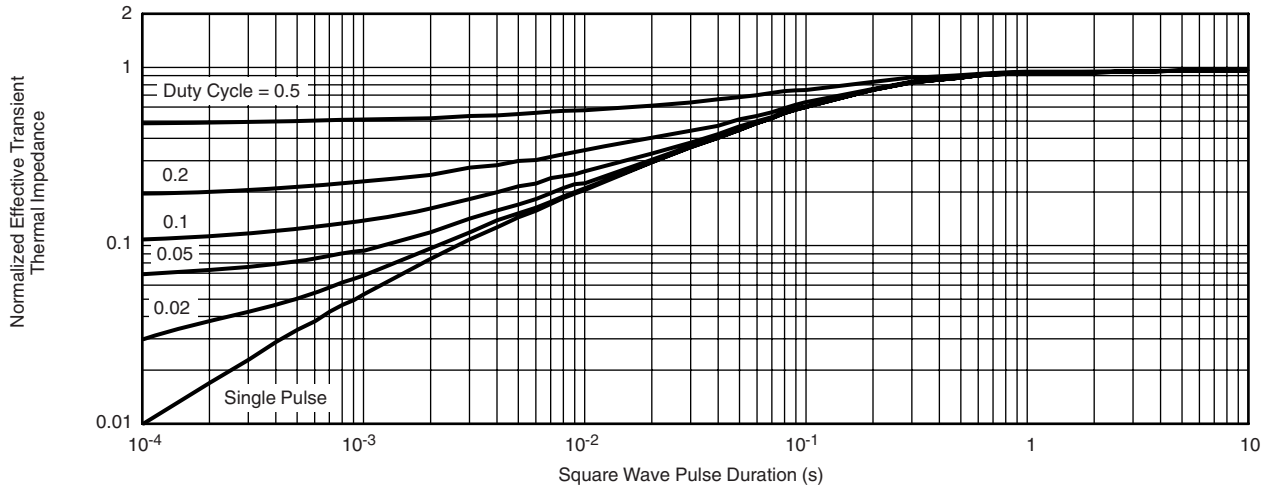


Capacitance

SCHOTTKY TYPICAL CHARACTERISTICS T_A = 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

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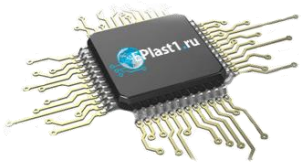
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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