

Dual N-channel Enhancement Mode Power MOSFET

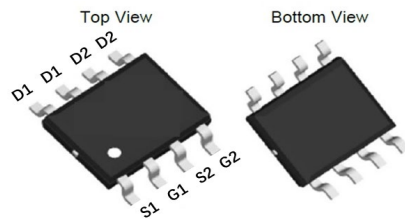
Features

- $V_{DS} = 20V$, $I_D = 10 A$
 $R_{DS(ON)} < 9 m\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 12 m\Omega$ @ $V_{GS} = 4.5V$

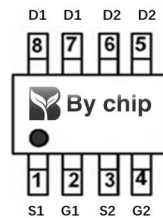
General Features

- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead Free and Green Available

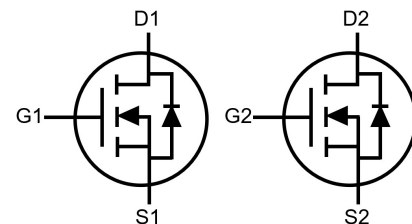
100% UIS TESTED!
100% ΔV_{ds} TESTED!



SOP-8 (Dual)



Pin Assignment



Schematic diagram

ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_J = 150\text{ }^{\circ}\text{C}$)	$T_C = 25\text{ }^{\circ}\text{C}$	10 ^a	A
	$T_C = 70\text{ }^{\circ}\text{C}$	7.0	
	$T_A = 25\text{ }^{\circ}\text{C}$	8.1 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$	7.2 ^{b, c}	
Pulsed Drain Current	I_{DM}	44	A
Continuous Source-Drain Diode Current	$T_C = 25\text{ }^{\circ}\text{C}$	3.25	A
	$T_A = 25\text{ }^{\circ}\text{C}$	1.88 ^{b, c}	
Single Pulse Avalanche Current	I_{AS}	6	mJ
Single Pulse Avalanche Energy	E_{AS}	1.45	
Maximum Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	2.7	W
	$T_C = 70\text{ }^{\circ}\text{C}$	1.77	
	$T_A = 25\text{ }^{\circ}\text{C}$	1.78 ^{b, c}	
	$T_A = 70\text{ }^{\circ}\text{C}$	1.14 ^{b, c}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	$^{\circ}\text{C}$

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{a, c, d}	R_{thJA}	58	70	$^{\circ}\text{C/W}$
Maximum Junction-to-Foot (Drain)	R_{thJF}	38	45	

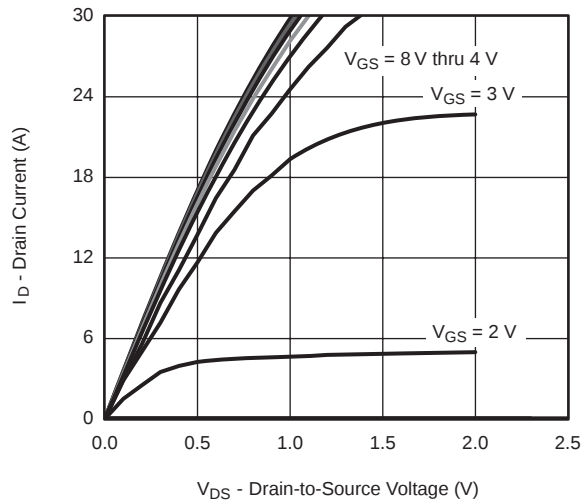
SPECIFICATIONS T _J = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	20			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = 250 μA		32		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			- 5.0		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	0.5		1.0	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 12 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 20 V, V _{GS} = 0 V			1	μA
		V _{DS} = 20 V, V _{GS} = 0 V, T _J = 55 °C			10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 4.5 V	10			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 4.5 V I _D = 5 A		0.009		Ω
		V _{GS} = 2.5 V, I _D = 4 A		0.012		
Forward Transconductance ^a	g _{fs}	V _{DS} = 10 V, I _D = 5 A		16		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = 10V, V _{GS} = 0 V, f = 1 MHz		586		pF
Output Capacitance	C _{oss}			117		
Reverse Transfer Capacitance	C _{rss}			55		
Total Gate Charge	Q _g	V _{DS} = 10 V, V _{GS} = 10 V, I _D = 5 A		15		nC
Gate-Source Charge	Q _{gs}	V _{DS} = 10V, V _{GS} = 4.5 V, I _D = 5 A		3.7	5.6	
Gate-Drain Charge	Q _{gd}			1.4		
Gate Resistance	R _g			1.05		
Gate Resistance	R _g	f = 1 MHz	0.8	4.3	8.6	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10 V, R _L = 3 Ω I _D ≅ 5 A, V _{GEN} = 4.5 V, R _g = 1 Ω		12	24	ns
Rise Time	t _r			55	100	
Turn-Off Delay Time	t _{d(off)}			11	22	
Fall Time	t _f			8	16	
Turn-On Delay Time	t _{d(on)}	V _{DD} = 10V, R _L = 3 Ω I _D ≅ 5 A, V _{GEN} = 10 V, R _g = 1 Ω		4	8	
Rise Time	t _r			9	18	
Turn-Off Delay Time	t _{d(off)}			10	20	
Fall Time	t _f			6	12	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			2.35	A
Pulse Diode Forward Current	I _{SM}				24	
Body Diode Voltage	V _{SD}	I _S = 2 A, V _{GS} = 0 V		0.8	1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = 5 A, dI/dt = 100 A/μs, T _J = 25 °C		11	20	ns
Body Diode Reverse Recovery Charge	Q _{rr}			4	8	nC
Reverse Recovery Fall Time	t _a			7		ns
Reverse Recovery Rise Time	t _b			4		

Notes:

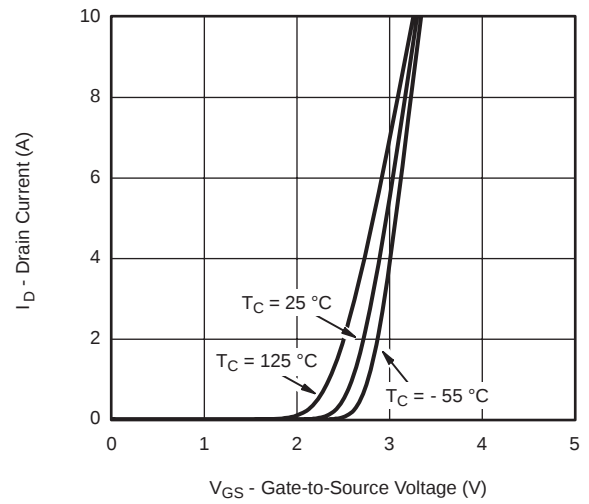
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing.

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.

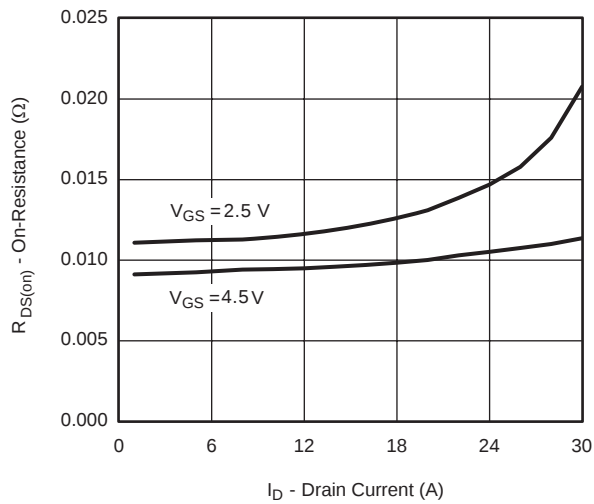
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



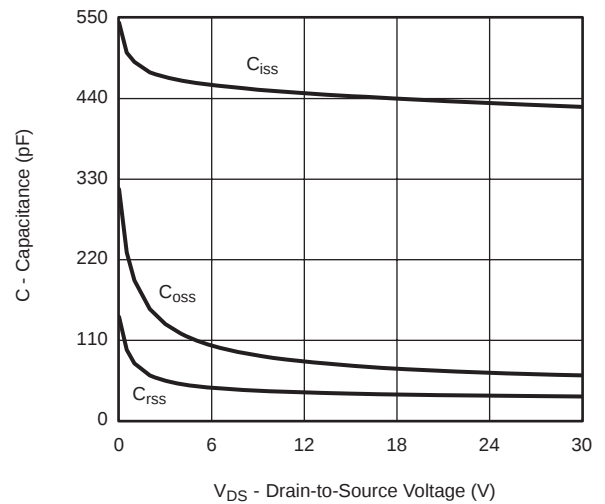
Output Characteristics



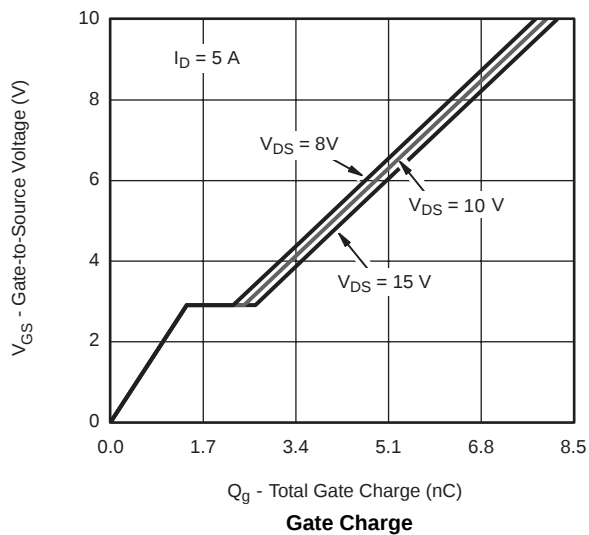
Transfer Characteristics



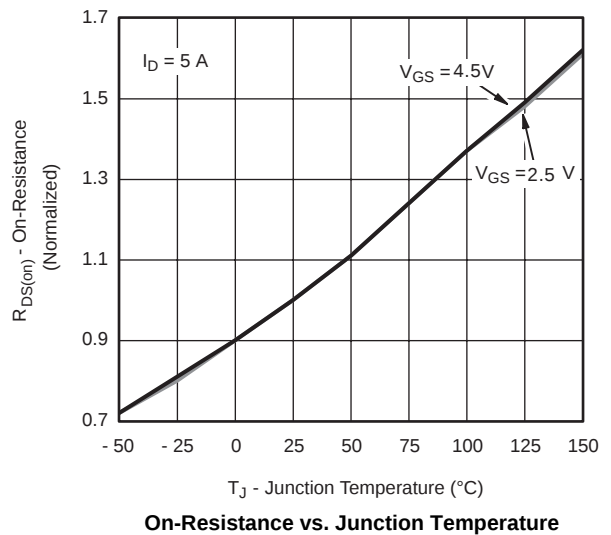
On-Resistance vs. Drain Current



Capacitance

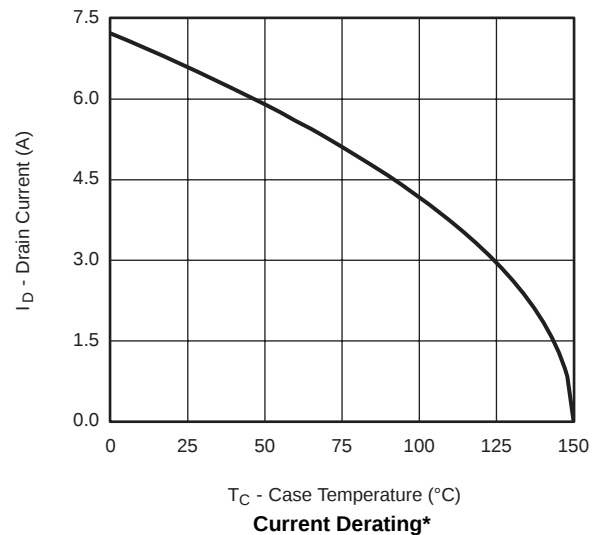
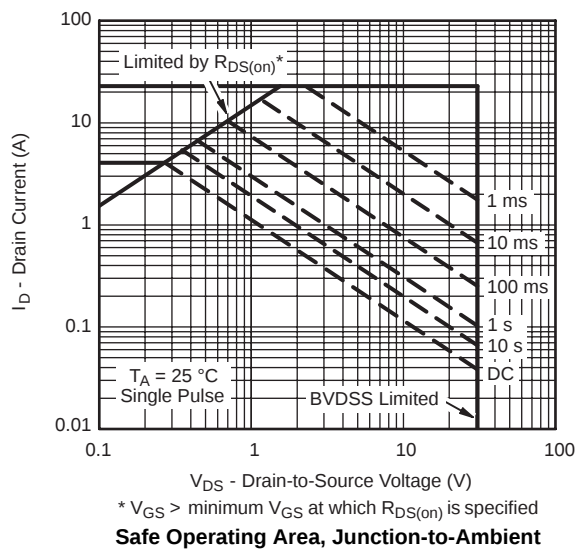
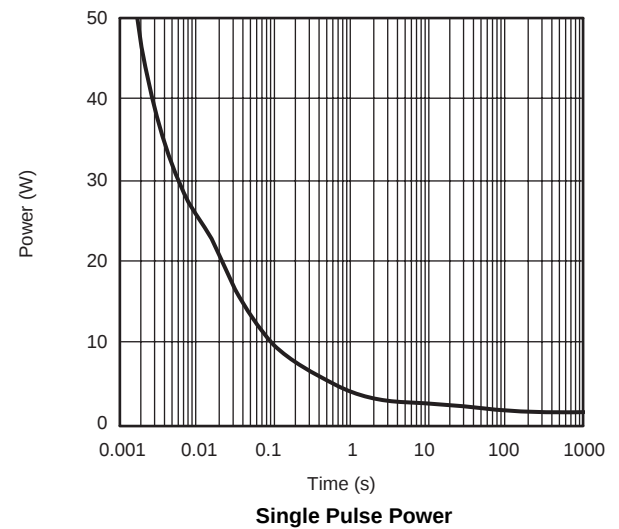
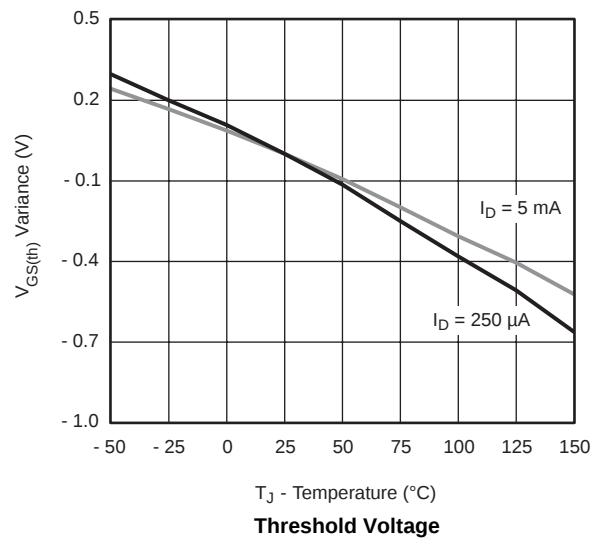
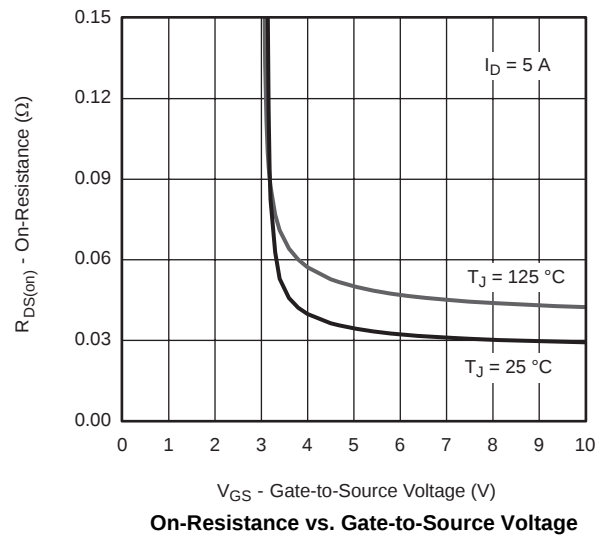
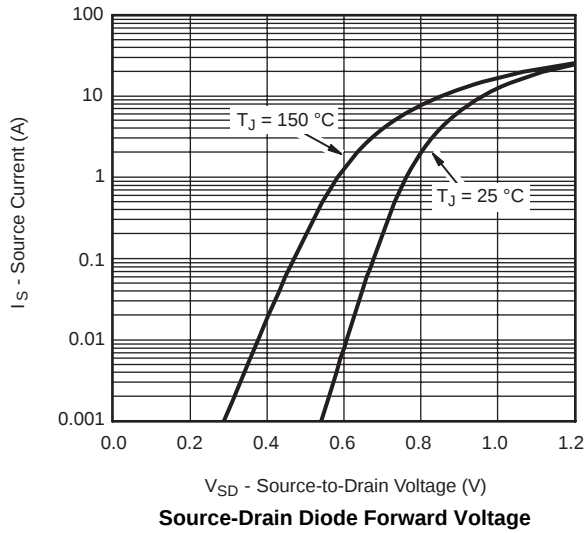


Gate Charge

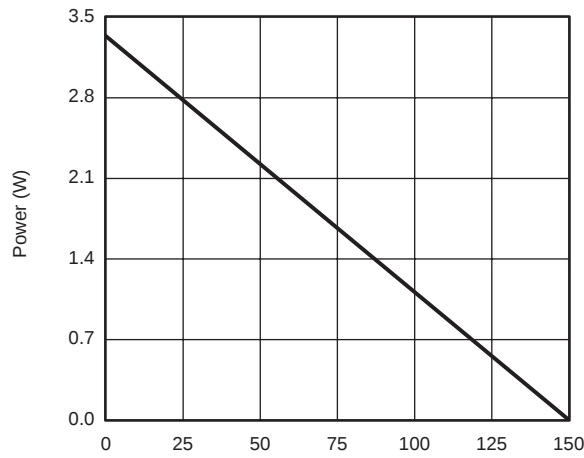


On-Resistance vs. Junction Temperature

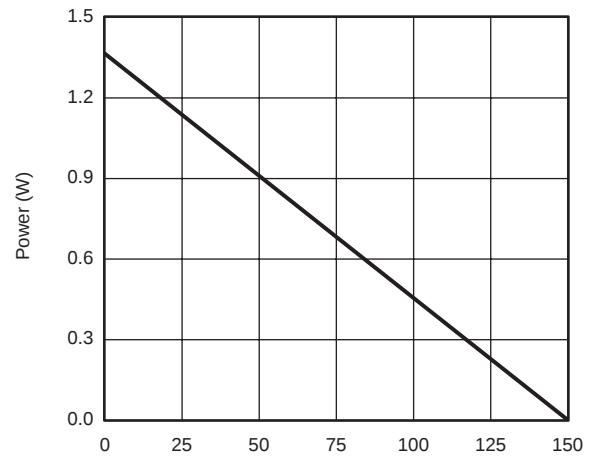
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



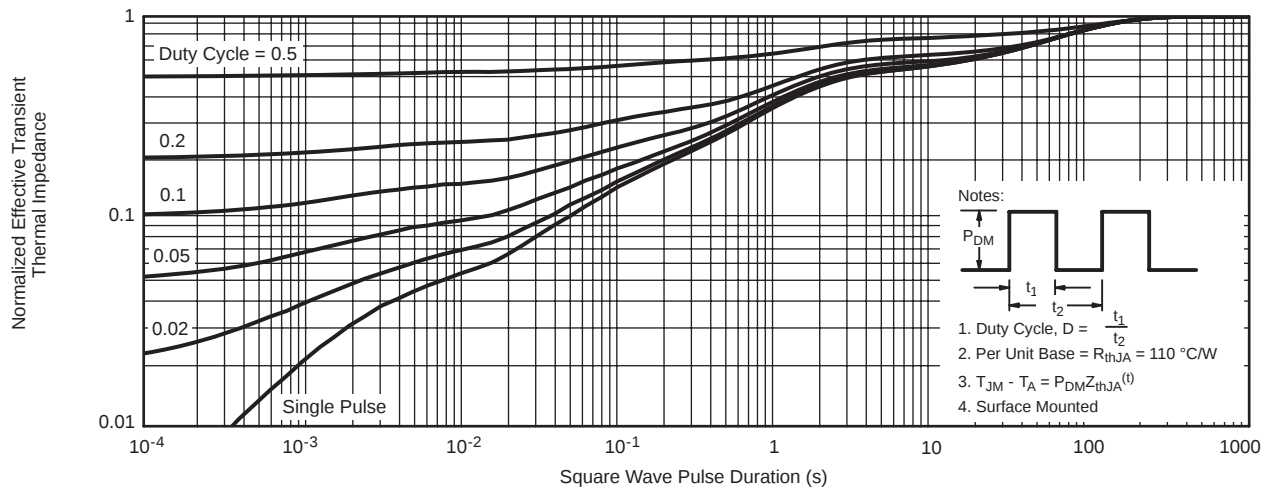
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



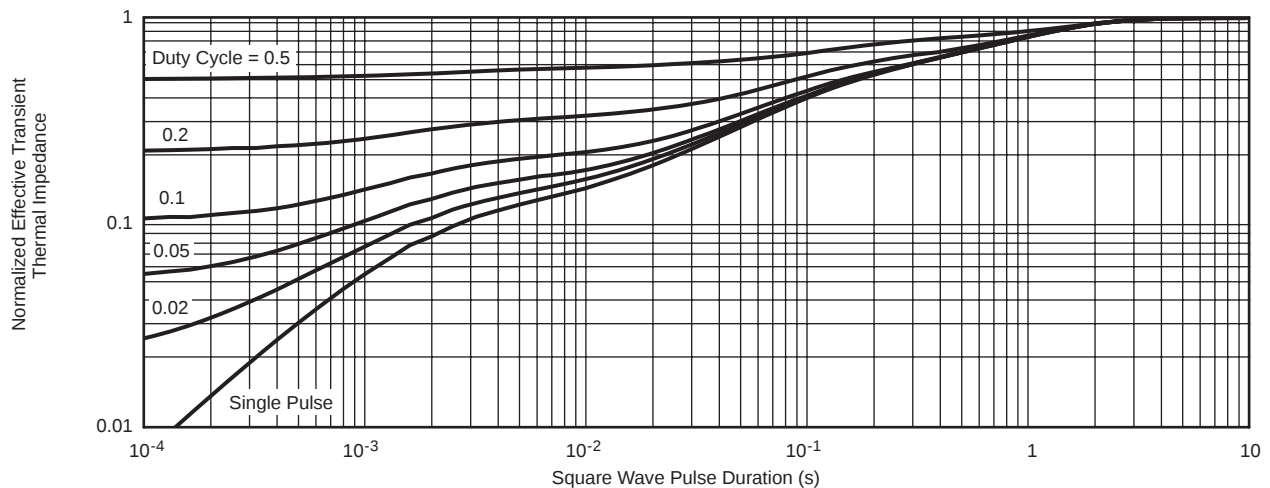
Power, Junction-to-Foot



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot