

Dual N-Channel Advanced Power MOSFET

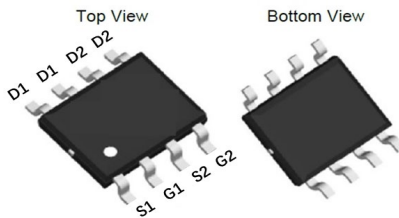
Features

- $V_{DS} = 100V$, $I_D = 12A$
 $R_{DS(ON)} < 12\text{ m}\Omega$ @ $V_{GS} = 10V$
 $R_{DS(ON)} < 14\text{ m}\Omega$ @ $V_{GS} = 4.5V$

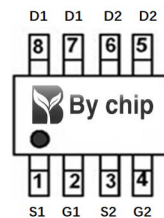
General Features

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

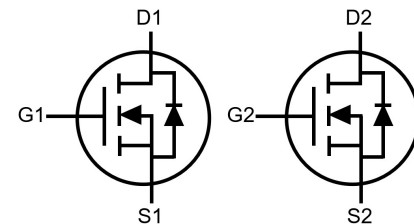
100% UIS TESTED!
 100% ΔV_{ds} TESTED!



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}	100	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 150\text{ }^\circ\text{C}$)	$T_C = 25\text{ }^\circ\text{C}$	I_D	12	A
	$T_C = 70\text{ }^\circ\text{C}$		9.6	
	$T_A = 25\text{ }^\circ\text{C}$		$10^{b,c}$	
	$T_A = 70\text{ }^\circ\text{C}$		$8.3^{b,c}$	
Pulsed Drain Current ($t = 300\text{ }\mu\text{s}$)		I_{DM}	45	
Continuous Source-Drain Diode Current	$T_C = 25\text{ }^\circ\text{C}$	I_S	5.4	
	$T_A = 25\text{ }^\circ\text{C}$		$2.7^{b,c}$	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	30	
Avalanche Energy		E_{AS}	45	mJ
Maximum Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	P_D	6	W
	$T_C = 70\text{ }^\circ\text{C}$		3.8	
	$T_A = 25\text{ }^\circ\text{C}$		$3^{b,c}$	
	$T_A = 70\text{ }^\circ\text{C}$		$1.9^{b,c}$	
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 ^{b, d}	$t \leq 10\text{ s}$	R_{thJA}	33	42	$^\circ\text{C/W}$
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	16	21	

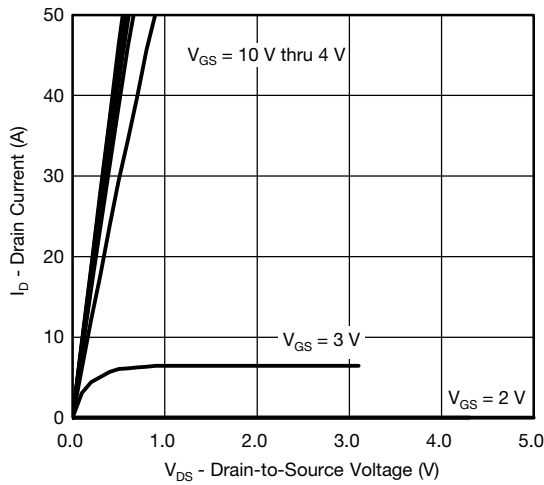
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = 250\text{ }\mu\text{A}$		64		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 5.8		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.0		2.5	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	30			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 10\text{ A}$			0.012	Ω
		$V_{GS} = 7.5\text{ V}, I_D = 10\text{ A}$			0.013	
		$V_{GS} = 4.5\text{ V}, I_D = 8\text{ A}$			0.014	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 10\text{ A}$		54		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1970		pF
Output Capacitance	C_{oss}			695		
Reverse Transfer Capacitance	C_{rss}			62		
Total Gate Charge	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 8\text{ A}$		44.4	67	nC
		$V_{DS} = 50\text{ V}, V_{GS} = 4.5\text{ V}, I_D = 8\text{ A}$		20.7	31	
Gate-Source Charge	Q_{gs}		6.1			
Gate-Drain Charge	Q_{gd}		9.1			
Output Charge	Q_{oss}		$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}$	56	85	
Gate Resistance	R_g	$f = 1\text{ MHz}$	0.4	1.1	2.2	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 5\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 7.5\text{ V}, R_g = 1\text{ }\Omega$		15	30	ns
Rise Time	t_r			11	22	
Turn-Off Delay Time	$t_{d(off)}$			31	60	
Fall Time	t_f			10	20	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 5\text{ }\Omega$ $I_D \cong 10\text{ A}, V_{GEN} = 10\text{ V}, R_g = 1\text{ }\Omega$		12	24	
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			34	65	
Fall Time	t_f			10	20	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			5.4	A
Pulse Diode Forward Current ^a	I_{SM}				70	
Body Diode Voltage	V_{SD}	$I_S = 5\text{ A}$		0.76	1.1	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = 10\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		42	80	ns
Body Diode Reverse Recovery Charge	Q_{rr}			40	80	nC
Reverse Recovery Fall Time	t_a			19		ns
Reverse Recovery Rise Time	t_b			23		

Notes:

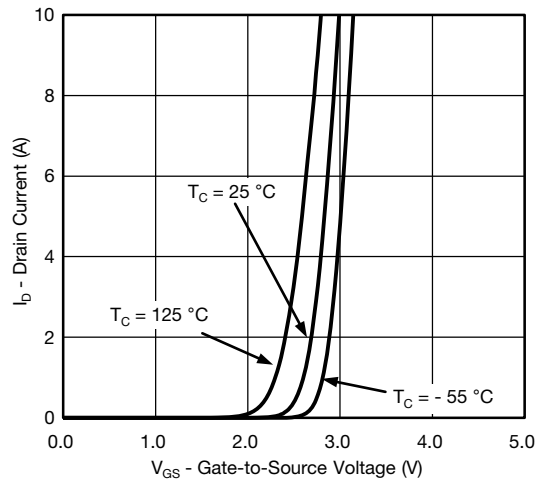
- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
 b. Guaranteed by design, not subject to production testing.

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.

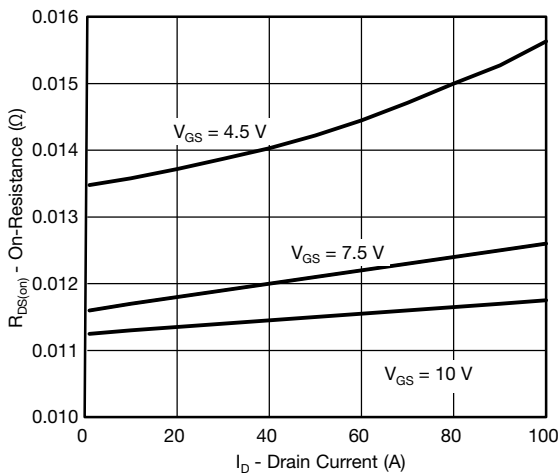
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



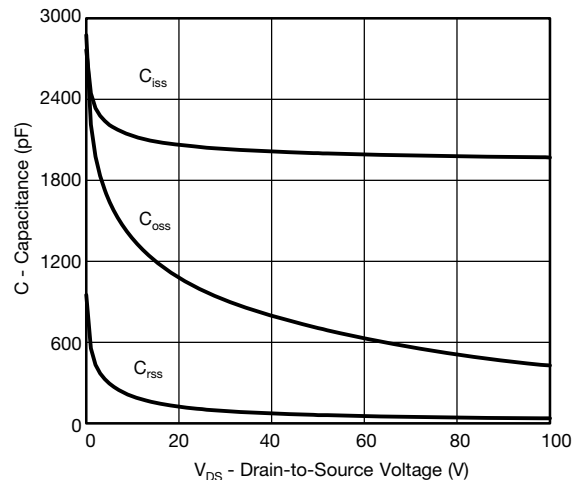
Output Characteristics



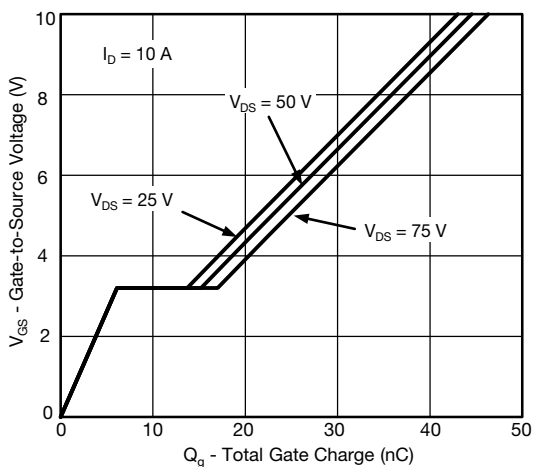
Transfer Characteristics



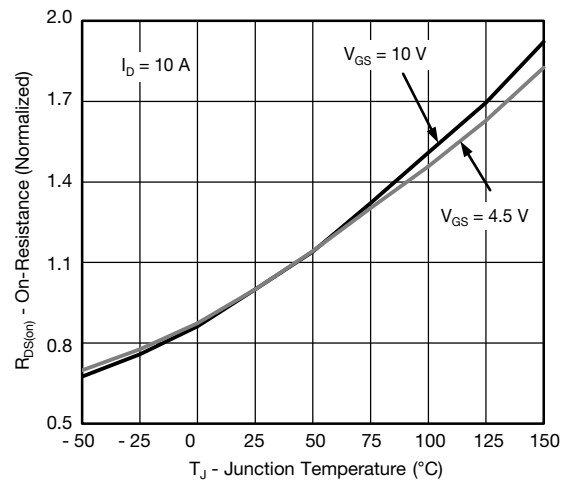
On-Resistance vs. Drain Current



Capacitance

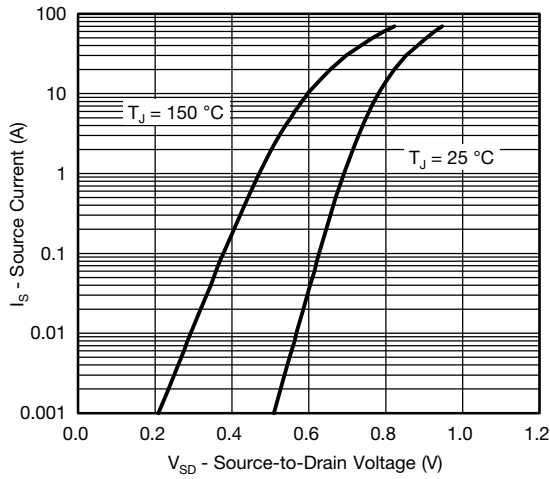


Gate Charge

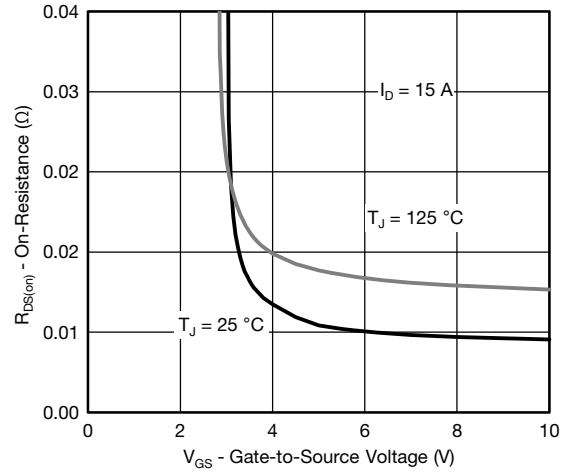


On-Resistance vs. Junction Temperature

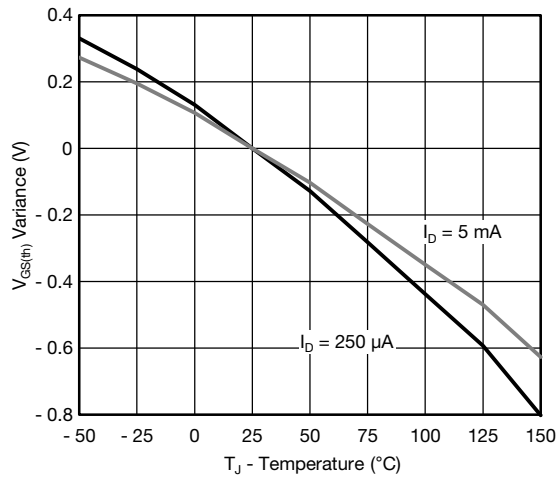
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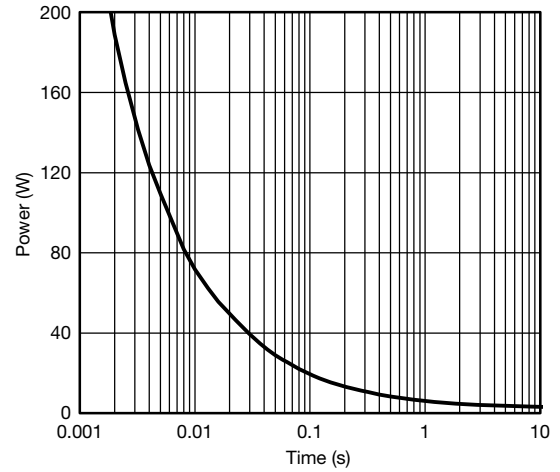
Source-Drain Diode Forward Voltage



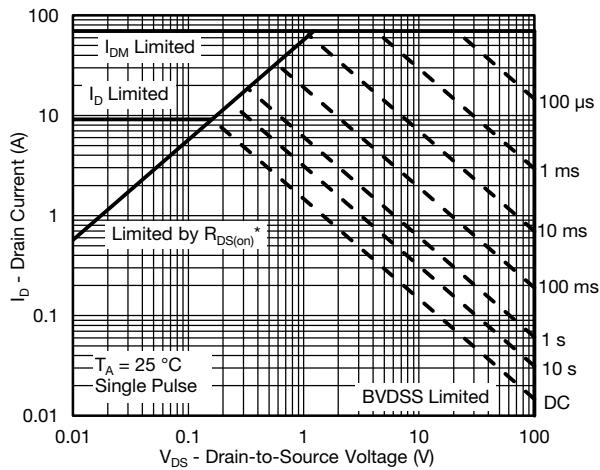
On-Resistance vs. Gate-to-Source Voltage



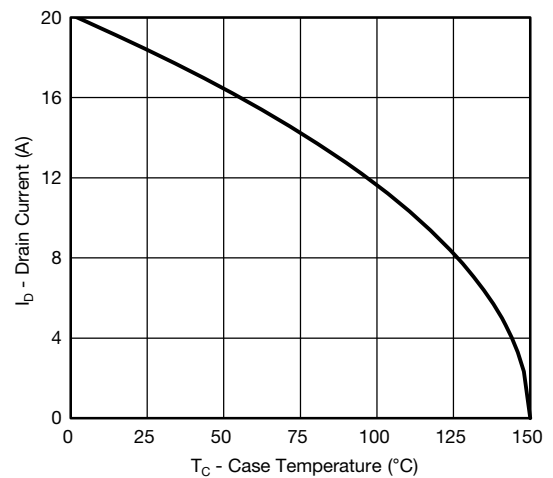
Threshold Voltage



Single Pulse Power, Junction-to-Ambient

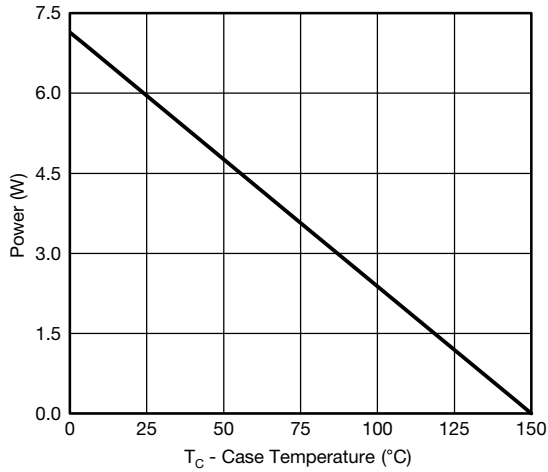


Safe Operating Area, Junction-to-Ambient

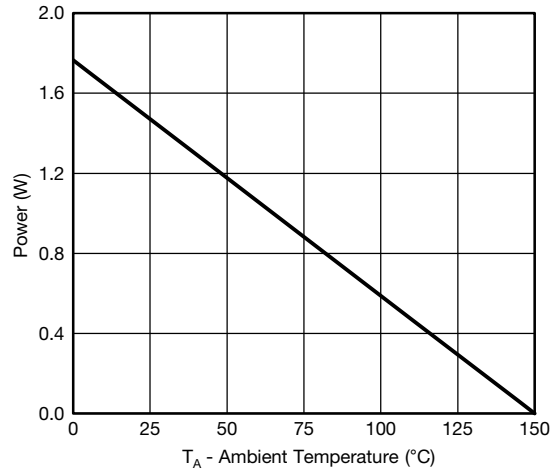


Current Derating*

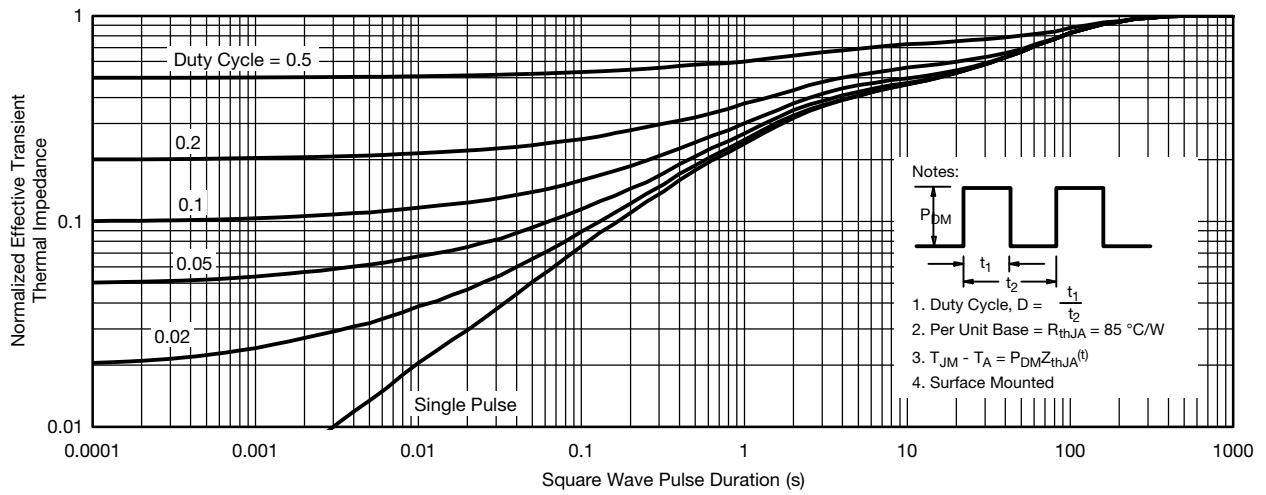
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



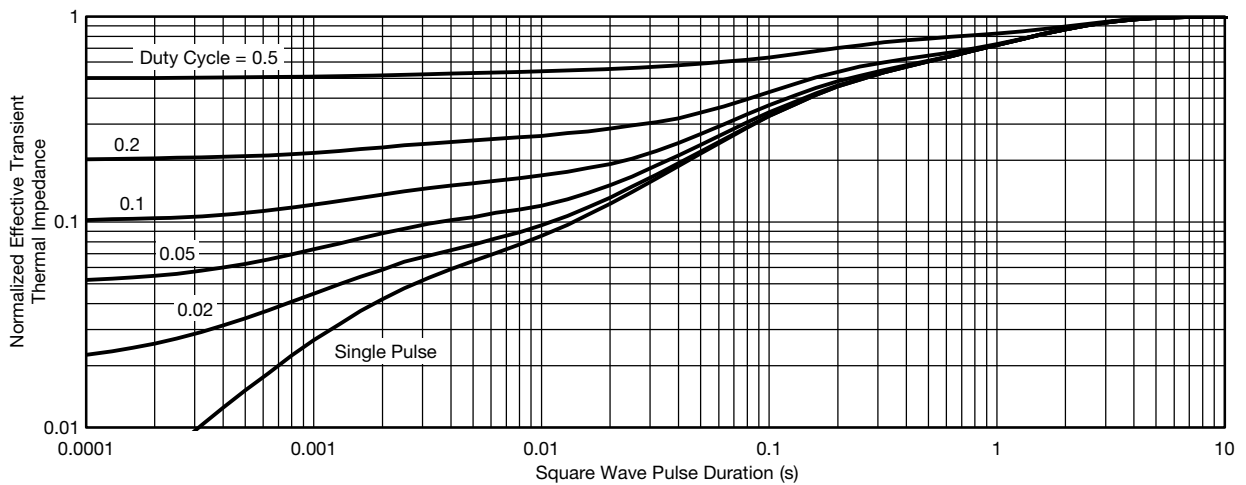
Power, Junction-to-Foot



Power, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot