

Dual P-channel Enhancement Mode Power MOSFET

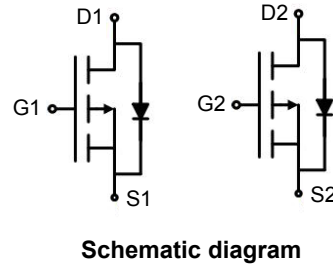
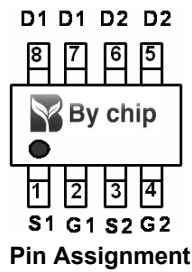
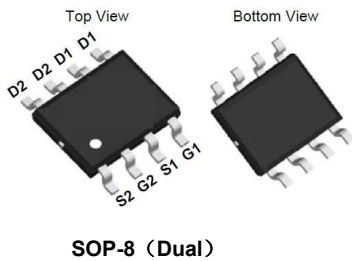
Features

- $V_{DS} = -60V$, $I_D = -5.3 A$
 $R_{DS(ON)} < 54m\Omega$ @ $V_{GS} = -10V$
 $R_{DS(ON)} < 60m\Omega$ @ $V_{GS} = -4.5V$

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!



ABSOLUTE MAXIMUM RATINGS $T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	- 60	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 150\text{ }^\circ\text{C}$)	I_D	$T_C = 25\text{ }^\circ\text{C}$	- 5.3 ^e	
		$T_C = 70\text{ }^\circ\text{C}$	- 5.0 ^e	
		$T_A = 25\text{ }^\circ\text{C}$	- 5.3 ^{a, b}	
		$T_A = 70\text{ }^\circ\text{C}$	- 5.0 ^{a, b}	
Pulsed Drain Current	I_{DM}	- 32 ^e	A	
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$		- 4.1
		$T_A = 25\text{ }^\circ\text{C}$		- 2.0 ^{a, b}
Avalanche Current	I_{AS}	- 20		mJ
Single-Pulse Avalanche Energy	E_{AS}	20		
Maximum Power Dissipation	P_D	$T_C = 25\text{ }^\circ\text{C}$	4.0	
		$T_C = 70\text{ }^\circ\text{C}$	2.5	
		$T_A = 25\text{ }^\circ\text{C}$	2.0 ^{a, b}	
		$T_A = 70\text{ }^\circ\text{C}$	1.4 ^{a, b}	
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}	$t \leq 10\text{ s}$	R_{thJA}	38	50	$^\circ\text{C/W}$
Maximum Junction-to-Foot	Steady State	R_{thJF}	20	25	

Notes:

- Surface mounted on 1" x 1" FR4 board.
- $t = 10\text{ s}$.
- Maximum under Steady State conditions is 85 $^\circ\text{C/W}$.
- Based on $T_C = 25\text{ }^\circ\text{C}$.
- Limited by package.

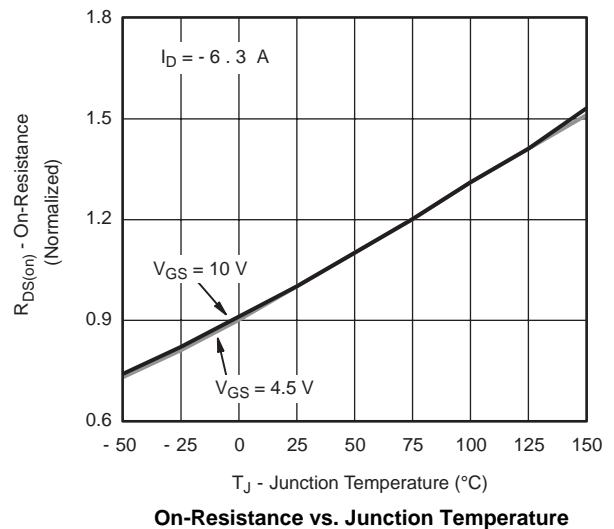
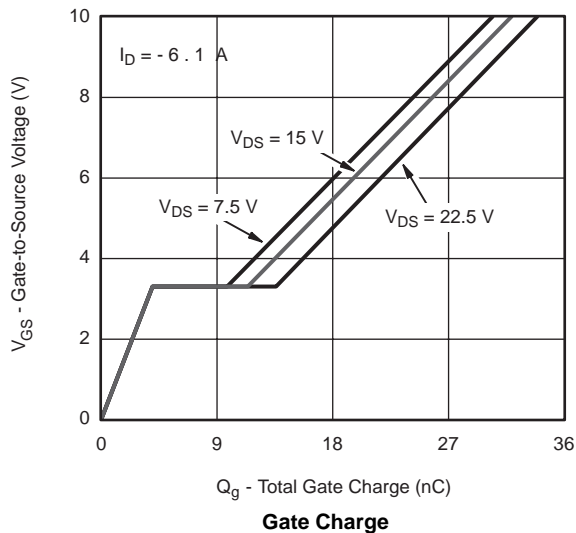
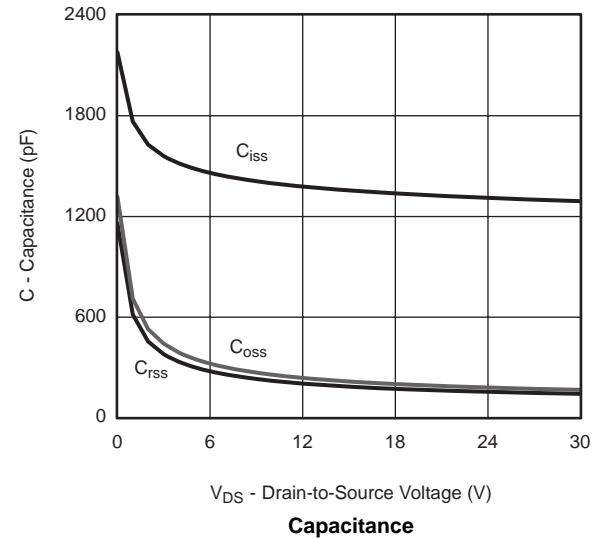
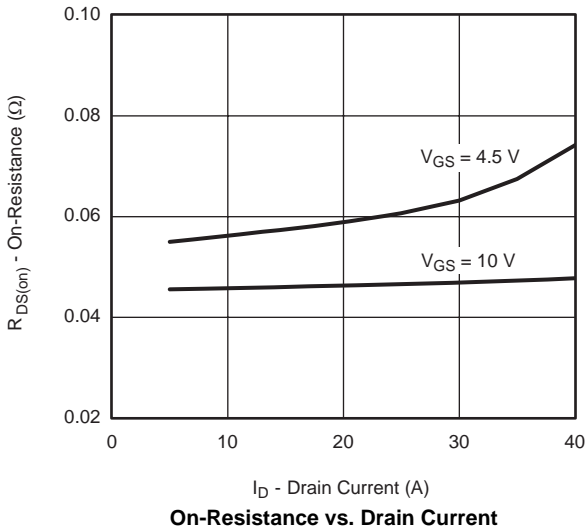
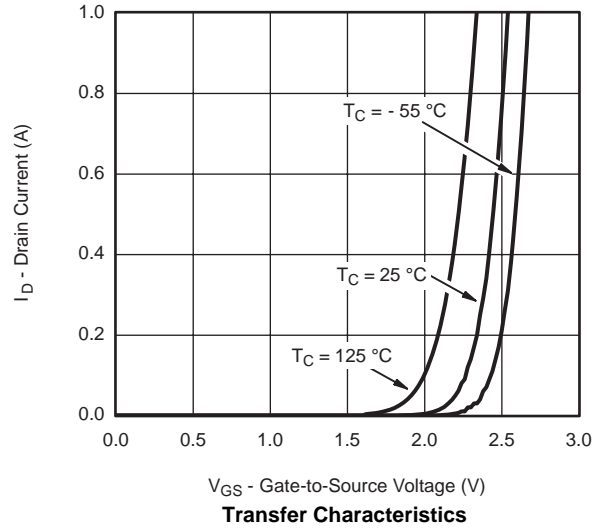
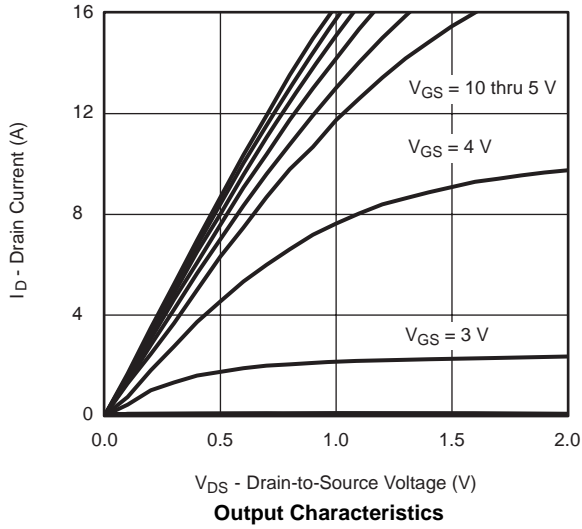
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	-60			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		-31		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		4.5			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	-1.0		-3.0	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}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			-5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq -10\text{ V}, V_{GS} = -10\text{ V}$	-30			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		0.054		Ω
		$V_{GS} = -4.5\text{ V}, I_D = -4.5\text{ A}$		0.060		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -10\text{ V}, I_D = -5\text{ A}$		23		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -15\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1345		pF
Output Capacitance	C_{oss}		210			
Reverse Transfer Capacitance	C_{rss}		180			
Total Gate Charge	Q_g	$V_{DS} = -15\text{ V}, V_{GS} = -10\text{ V}, I_D = -5\text{ A}$		32	50	nC
		$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -5\text{ A}$		15	25	
Gate-Source Charge	Q_{gs}	$V_{DS} = -15\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -5\text{ A}$		4		nC
Gate-Drain Charge	Q_{gd}		7.5			
Gate Resistance	R_g		$f = 1\text{ MHz}$		5.8	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		10	15	ns
Rise Time	t_r		8	15		
Turn-Off Delay Time	$t_{d(off)}$		45	70		
Fall Time	t_f		12	25		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15\text{ V}, R_L = 15\text{ }\Omega$ $I_D \cong -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_g = 1\text{ }\Omega$		42	70	ns
Rise Time	t_r		35	60		
Turn-Off Delay Time	$t_{d(off)}$		40	70		
Fall Time	t_f		16	30		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			-4.1	A
Pulse Diode Forward Current	I_{SM}				-32	
Body Diode Voltage	V_{SD}	$I_S = -2\text{ A}, V_{GS} = 0\text{ V}$		-0.75	-1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -2\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		34	60	ns
Body Diode Reverse Recovery Charge	Q_{rr}		22	40	nC	
Reverse Recovery Fall Time	t_a		11		ns	
Reverse Recovery Rise Time	t_b		23			

Notes:

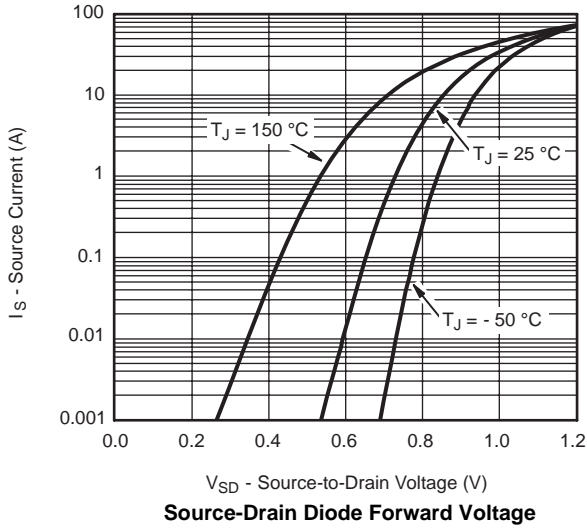
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.

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.

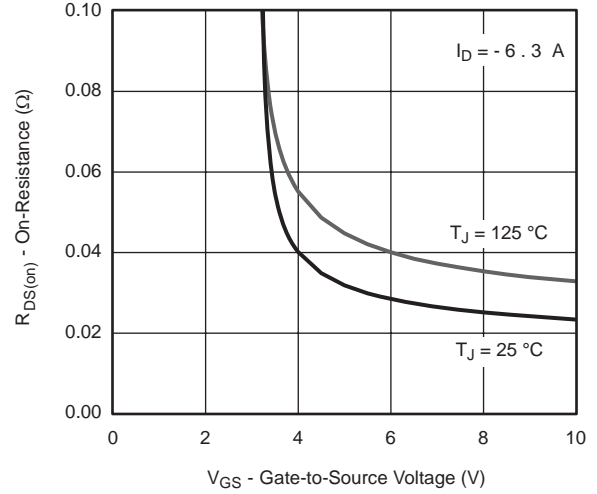
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



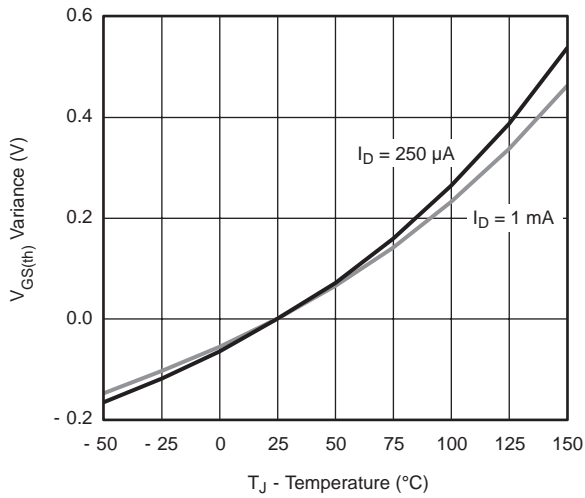
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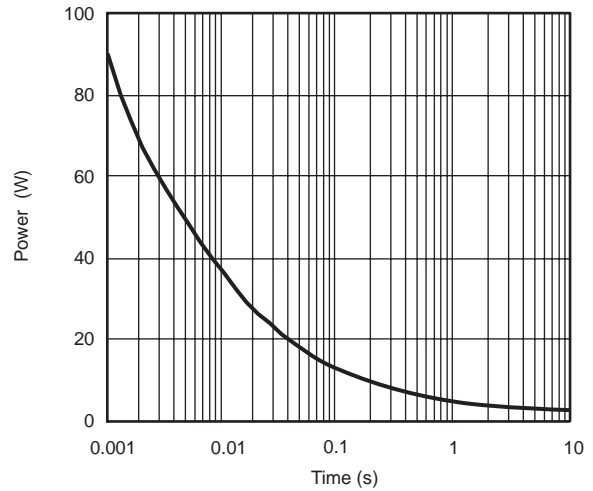
Source-Drain Diode Forward Voltage



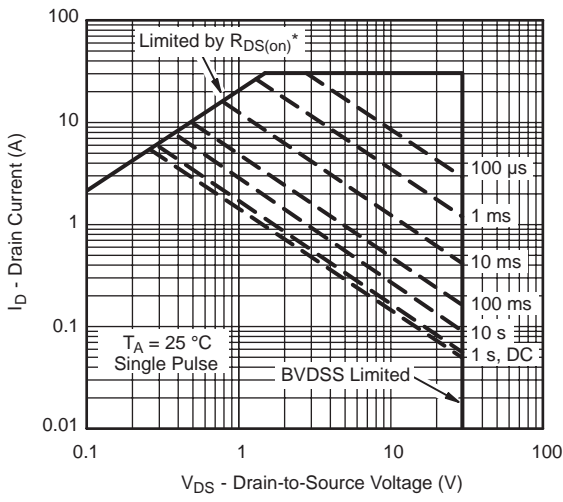
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

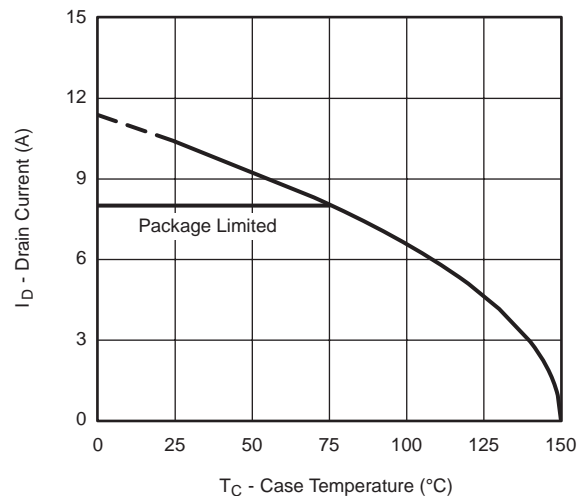


Single Pulse Power, Junction-to-Ambient



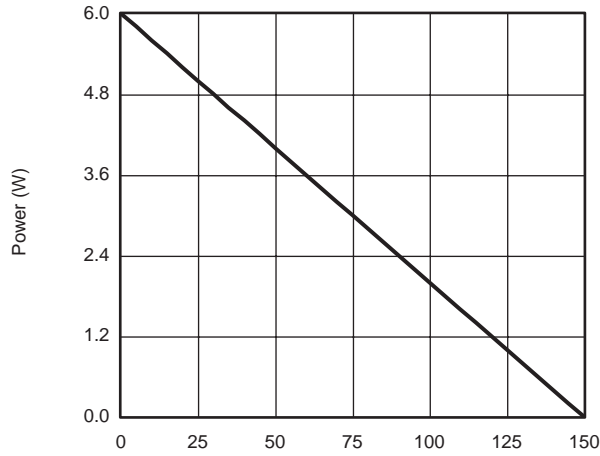
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area



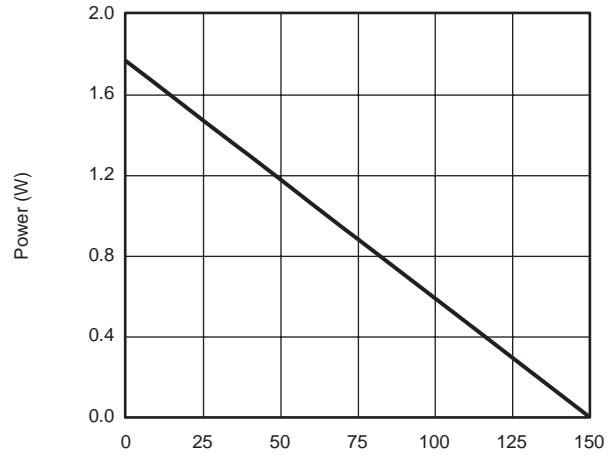
Current Derating*

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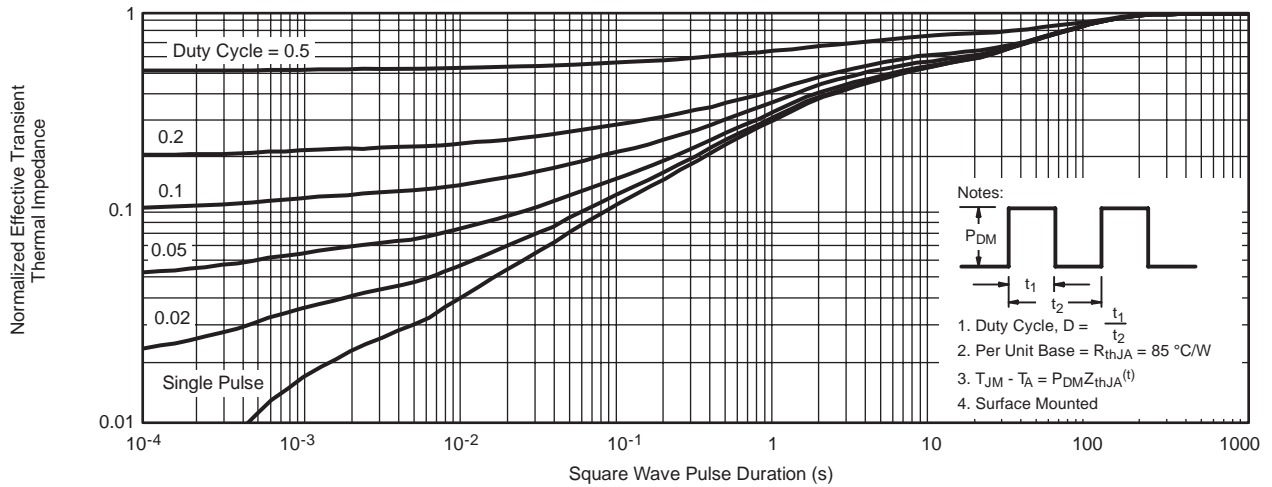
T_C - Case Temperature (°C)

Power, Junction-to-Foot

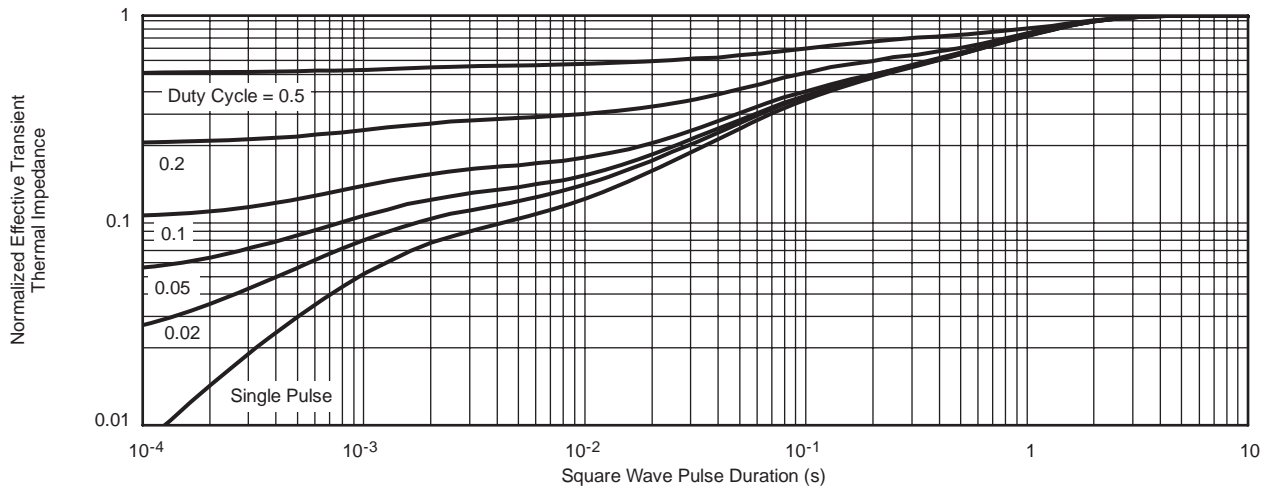


T_A - Ambient Temperature (°C)

Power Derating, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot