



P-Channel 8-V (D-S) MOSFET

PRODUCT SUMMARY

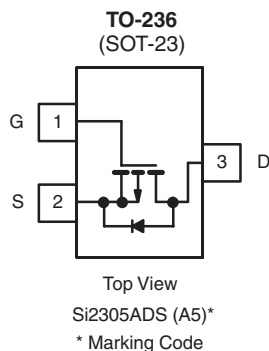
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ.)
- 8	0.040 at $V_{GS} = - 4.5$ V	- 4.1	7.8 nC
	0.060 at $V_{GS} = - 2.5$ V	- 3.4	
	0.088 at $V_{GS} = - 1.8$ V	- 2.0	

FEATURES

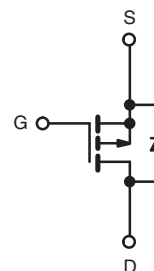
- Halogen-free Option Available
- TrenchFET® Power MOSFET
- 100 % R_g Tested

APPLICATIONS

- Load Switch
- DC/DC Converter

RoHS
COMPLIANT

Ordering Information: Si2305ADS-T1-E3 (Lead (Pb)-free)
Si2305ADS-T1-GE3 (Lead (Pb)-free and Halogen-free)



P-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 8	V
Gate-Source Voltage	V_{GS}	± 8	
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	A
		$T_C = 70$ °C	
		$T_A = 25$ °C	
		$T_A = 70$ °C	
Pulsed Drain Current	I_{DM}	- 10	A
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	
		$T_A = 25$ °C	- 0.8 ^{a, b}
Maximum Power Dissipation	P_D	$T_C = 25$ °C	W
		$T_C = 70$ °C	
		$T_A = 25$ °C	
		$T_A = 70$ °C	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 50 to 150	°C
Soldering Recommendations (Peak Temperature)		260	

Notes:

a. Surface Mounted on 1" x 1" FR4 board.

b. $t = 10$ s.

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{a, b}	$t \leq 10$ s	R_{thJA}	100	130	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	60	75	

Notes:

a. Surface Mounted on 1" x 1" FR4 board.

b. Maximum under Steady State conditions is 175 °C/W.

SPECIFICATIONS $T_J = 25$ °C, unless otherwise noted

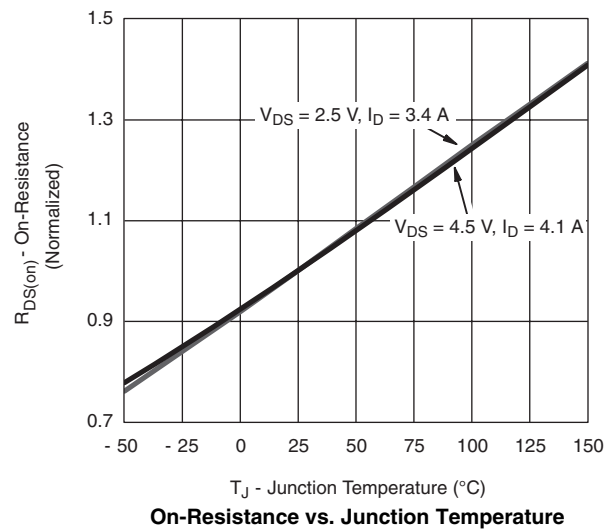
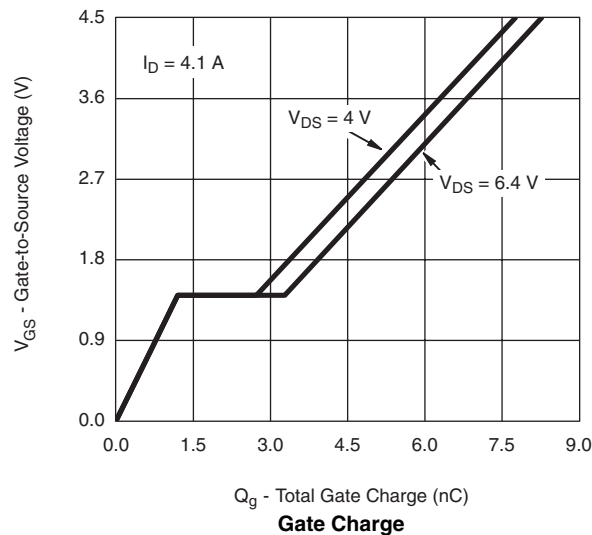
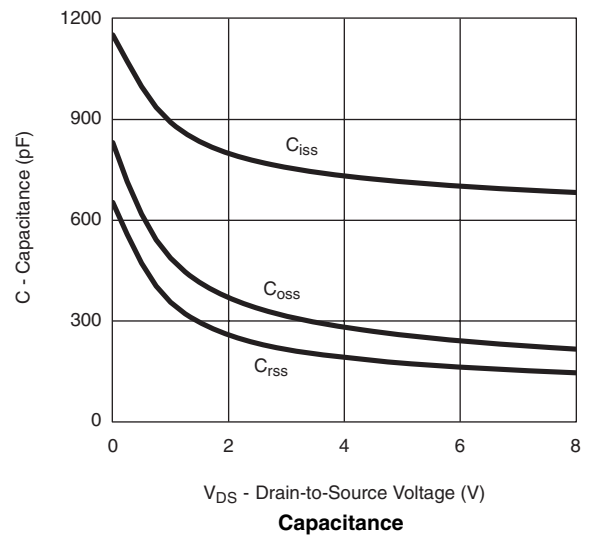
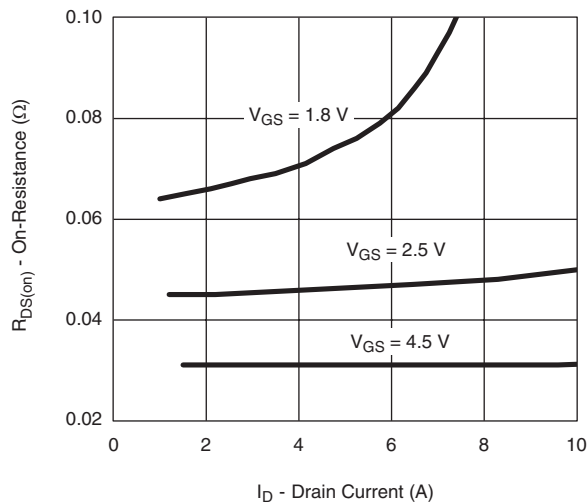
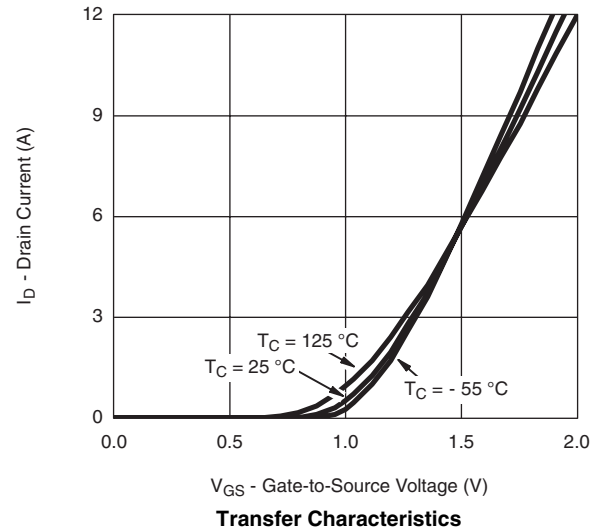
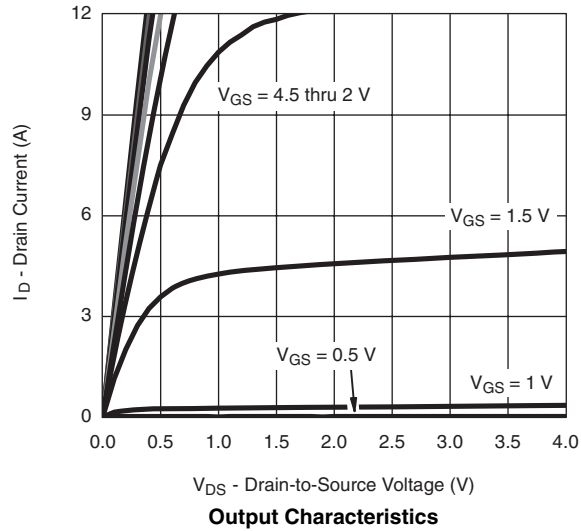
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 8			V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 55		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			2.1		
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 0.45		- 0.8	V
Gate-Source Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 8 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = - 8 V, V _{GS} = 0 V			- 1	μA
		V _{DS} = - 8 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	- 5			A
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 4.1 A		0.032	0.040	Ω
		V _{GS} = - 2.5 V, I _D = - 3.4 A		0.048	0.060	
		V _{GS} = - 1.8 V, I _D = - 2.0 A		0.070	0.088	
Forward Transconductance ^a	g _{fs}	V _{DS} = - 5 V, I _D = - 4.1 A		8		S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{DS} = - 4 V, V _{GS} = 0 V, f = 1 MHz		740		pF
Output Capacitance	C _{oss}			290		
Reverse Transfer Capacitance	C _{rss}			190		
Total Gate Charge	Q _g	V _{DS} = - 4 V, V _{GS} = - 4.5 V, I _D = - 4.1 A		7.8	15	nC
		V _{DS} = - 4 V, V _{GS} = - 2.5 V, I _D = - 4.1 A		4.5	9	
Gate-Source Charge	Q _{gs}			1.2		
Gate-Drain Charge	Q _{gd}			1.6		
Gate Resistance	R _g	f = 1 MHz	1.4	7	14	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 4 V, R _L = 1.2 Ω I _D ≡ - 3.3 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		13	20	ns
Rise Time	t _r			35	53	
Turn-Off DelayTime	t _{d(off)}			32	48	
Fall Time	t _f			10	20	
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 4 V, R _L = 1.2 Ω I _D ≡ - 3.3 A, V _{GEN} = - 8 V, R _g = 1 Ω		5	10	
Rise Time	t _r			11	17	
Turn-Off DelayTime	t _{d(off)}			22	33	
Fall Time	t _f			16	24	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			- 1.4	A
Pulse Diode Forward Current ^a	I _{SM}				- 10	
Body Diode Voltage	V _{SD}	I _F = - 3.3 A		- 0.8	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 3.3 A, dI/dt = 100 A/μs, T _J = 25 °C		33	50	ns
Body Diode Reverse Recovery Charge	Q _{rr}			14	21	nC
Reverse Recovery Fall Time	t _a			14		ns
Reverse Recovery Rise Time	t _b			19		

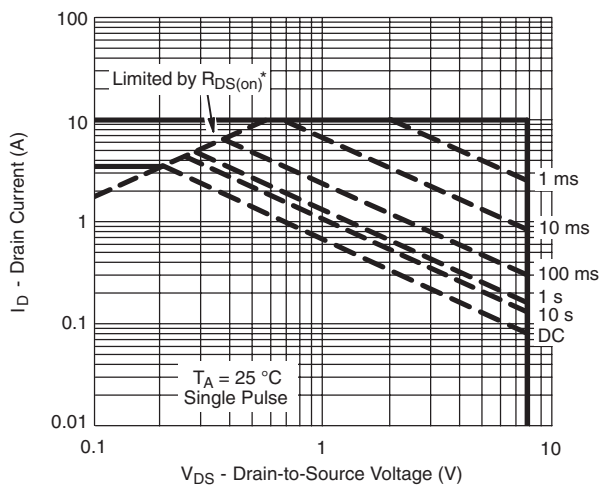
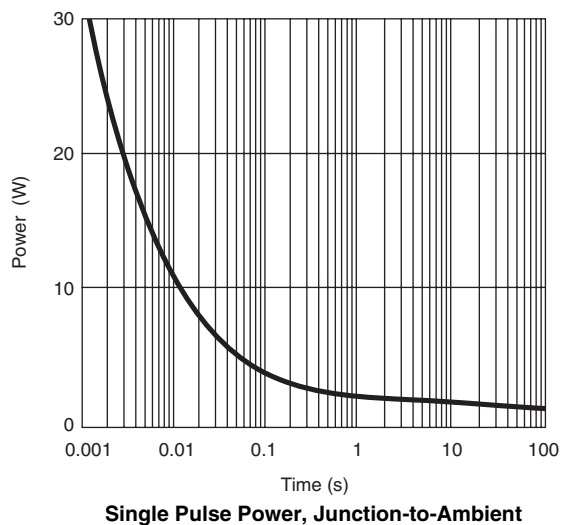
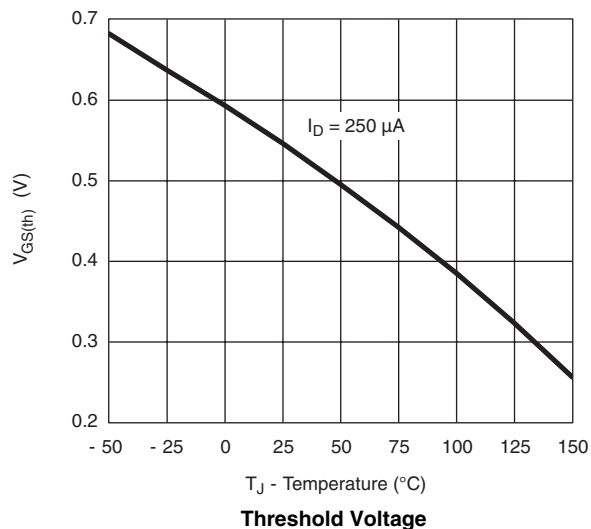
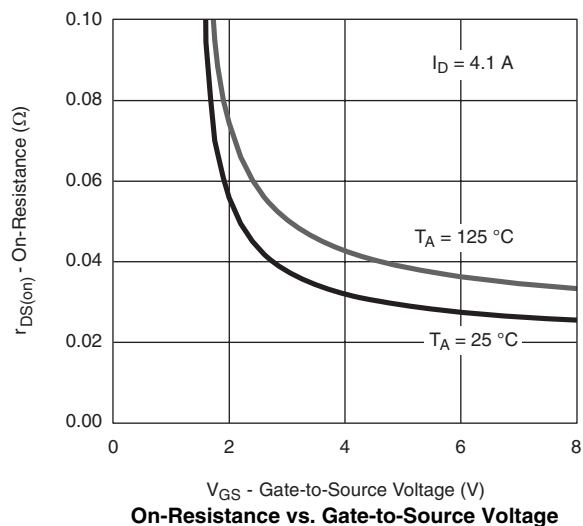
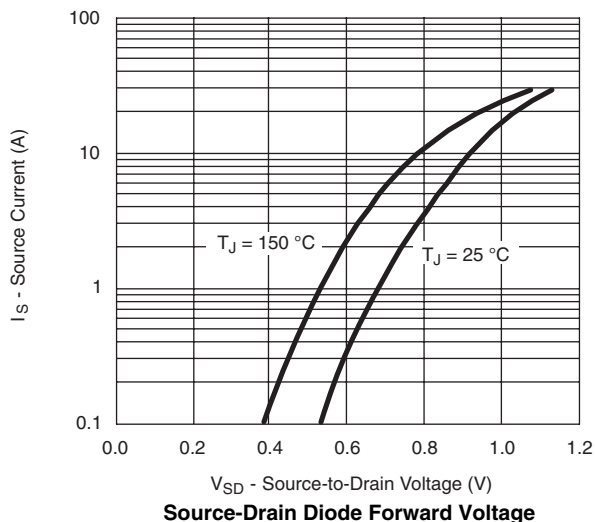
Notes:

a. Pulse test; pulse width ≤ 300 μ s, duty cycle ≤ 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

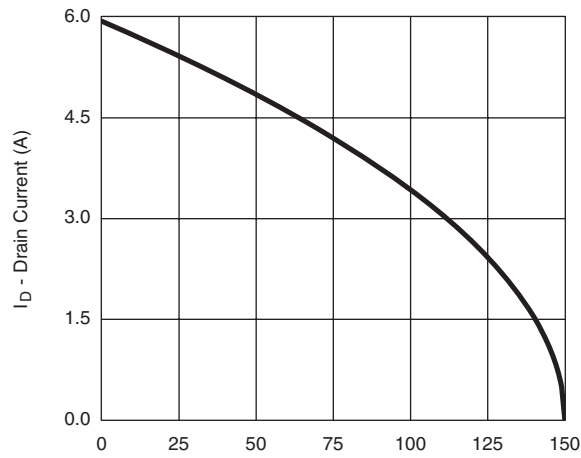
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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

Safe Operating Area, Junction-to-Ambient

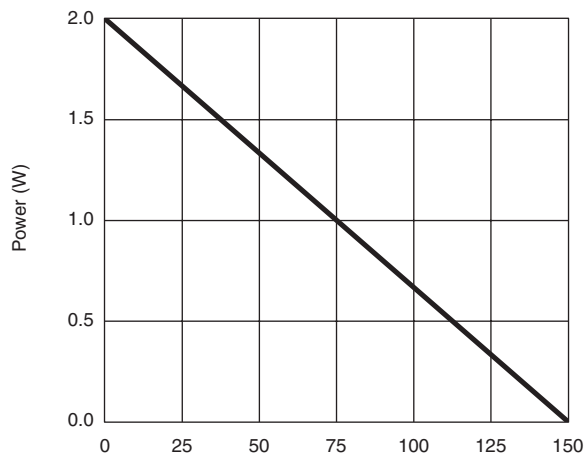


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



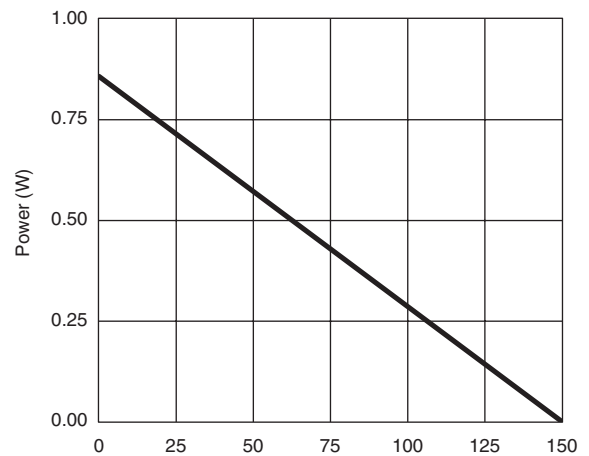
T_C - Case Temperature (°C)

Current Derating*



T_C - Case Temperature (°C)

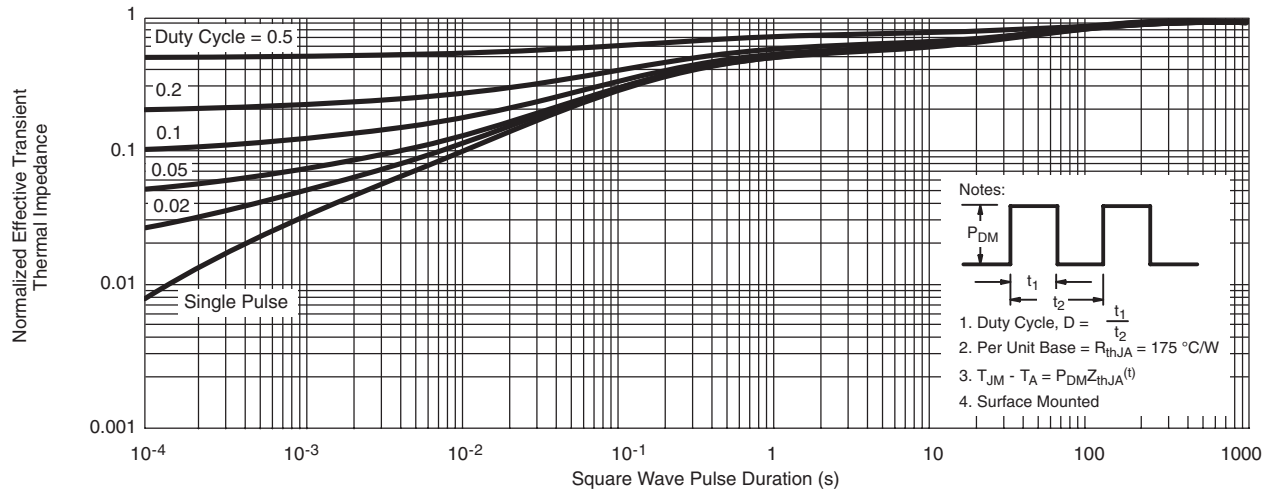
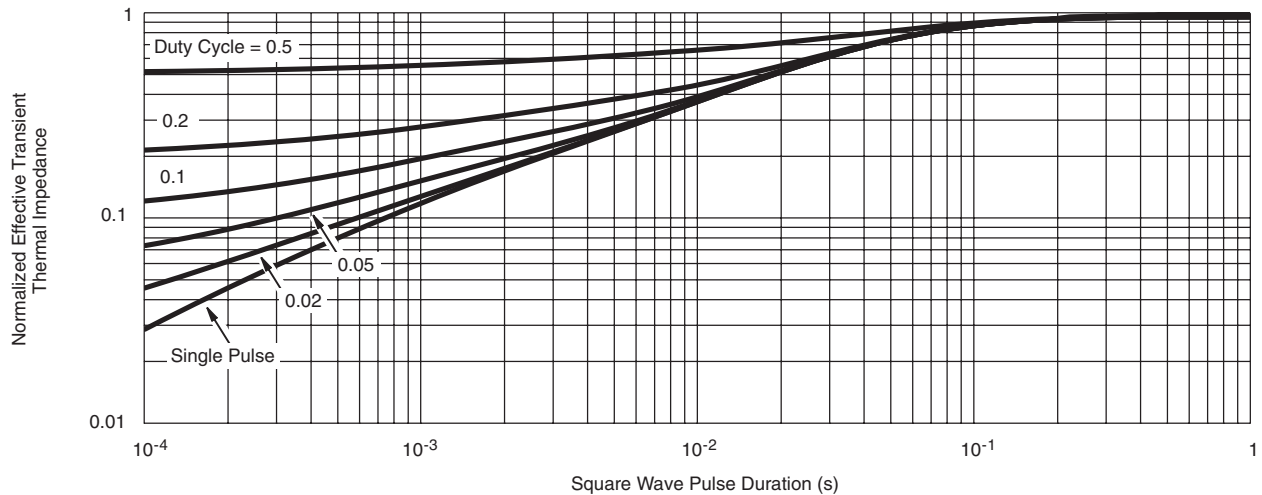
Power, Junction-to-Case



T_A - Ambient Temperature (°C)

Power, Junction-to-Ambient

* The power dissipation P_D is based on $T_{J(max)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted**Normalized Thermal Transient Impedance, Junction-to-Ambient****Normalized Thermal Transient Impedance, Junction-to-Foot**

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