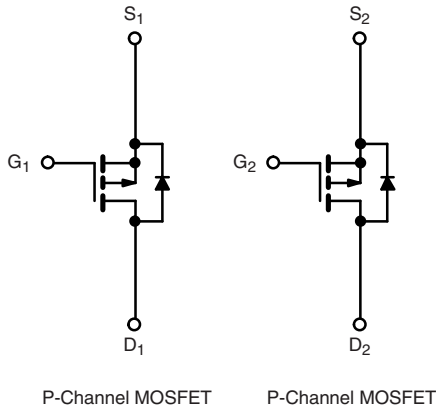


2502PZ-VB Datasheet

Dual P-Channel 20-V (D-S) MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^d	Q_g (Typ.)
- 20	0.013 at $V_{GS} = -4.5$ V	-7.5	20 nC
	0.018 at $V_{GS} = -2.5$ V	-6.5	
	0.032 at $V_{GS} = -1.8$ V	-5.0	



FEATURES

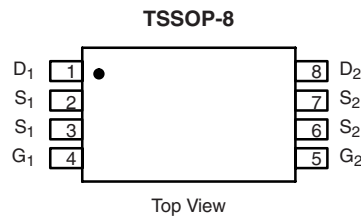
- Halogen-free According to IEC 61249-2-21 Definition
- Trench Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC



RoHS
COMPLIANT
HALOGEN
FREE

APPLICATIONS

- Adaptor Switch
- High Current Load Switch
- Notebook



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	- 20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current ($T_J = 150$ °C)	$T_C = 25$ °C	- 7.5	A
	$T_C = 70$ °C	- 6.0	
	$T_A = 25$ °C	- 5.4 ^{a, b}	
	$T_A = 70$ °C	- 4.5 ^{a, b}	
Pulsed Drain Current	I_{DM}	- 30	
Continuous Source-Drain Diode Current	$T_C = 25$ °C	- 4.1	
	$T_A = 25$ °C	- 2.1 ^{a, b}	
Avalanche Current	$L = 0.1$ mH	- 15	mJ
Single-Pulse Avalanche Energy	E_{AS}	11.25	
Maximum Power Dissipation	$T_C = 25$ °C	5	W
	$T_C = 70$ °C	3.2	
	$T_A = 25$ °C	2.5 ^{a, b}	
	$T_A = 70$ °C	1.6 ^{a, b}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^{a, c}	R_{thJA}	38	50	°C/W
Maximum Junction-to-Foot	R_{thJF}	20	25	

Notes:

- Surface mounted on 1" x 1" FR4 board.
- $t = 10$ s.
- Maximum under steady state conditions is 85 °C/W.
- Based on $T_C = 25$ °C.

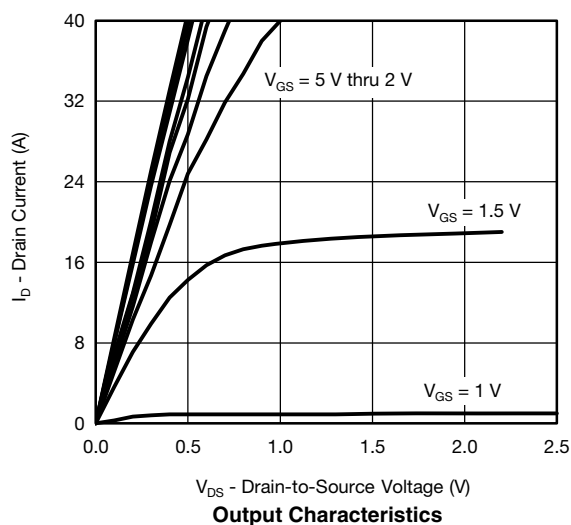
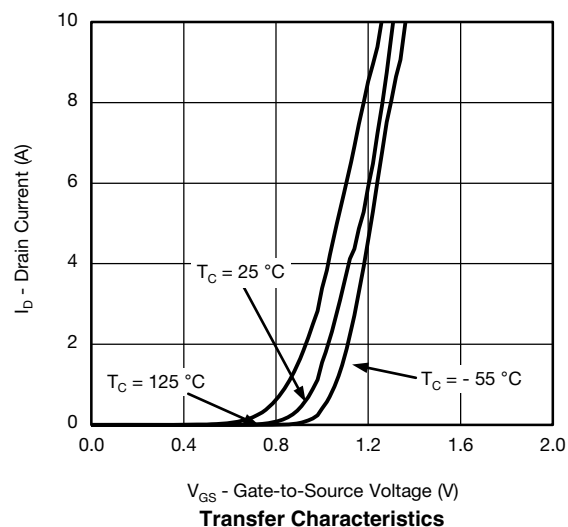
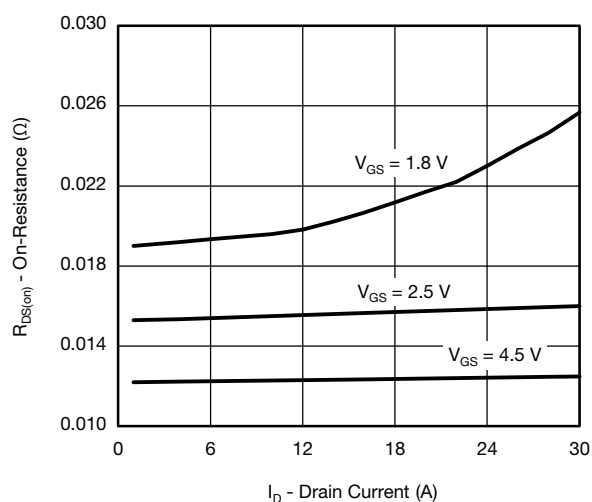
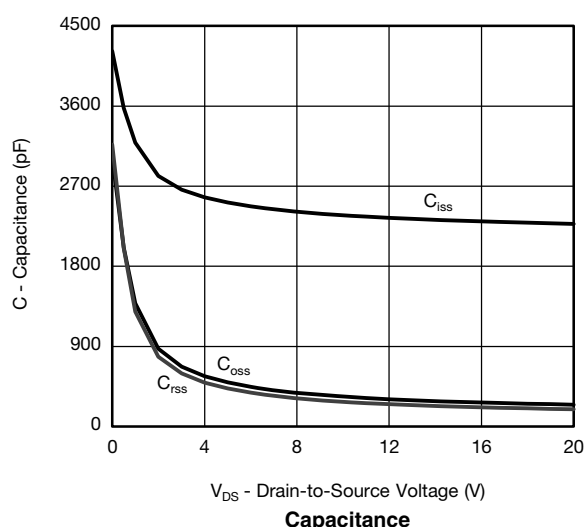
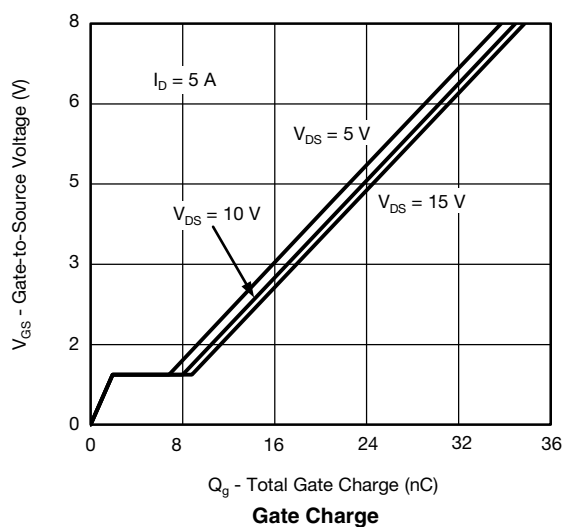
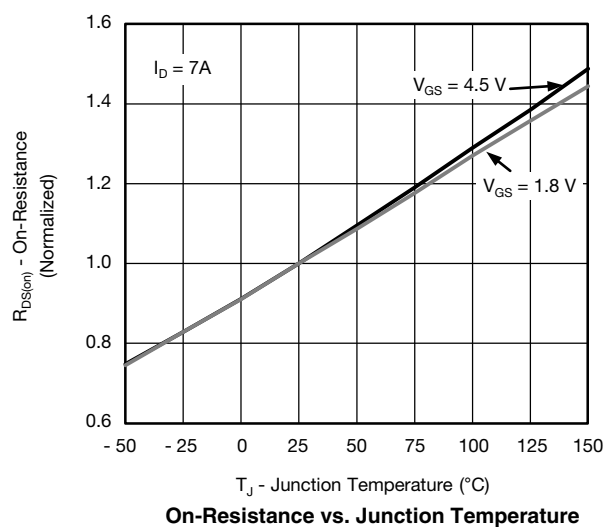
SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = - 250 μA	- 20			V	
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	I _D = - 250 μA		- 14.5		mV/°C	
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)} /T _J			2.8			
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = - 250 μA	- 0.4		- 1.0	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} = - 20 V, V _{GS} = 0 V			- 1	μA	
		V _{DS} = - 20 V, V _{GS} = 0 V, T _J = 70 °C			- 10		
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ - 10 V, V _{GS} = - 5 V	- 20			A	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 7 A		0.013		Ω	
		V _{GS} = - 2.5 V, I _D = - 6 A		0.018			
		V _{GS} = - 1.8 V, I _D = - 3 A		0.032			
Forward Transconductance ^a	g _{fs}	V _{DS} = - 10 V, I _D = - 9 A		40		S	
Dynamic ^b							
Input Capacitance	C _{iss}	V _{DS} = - 10 V, V _{GS} = 0 V, f = 1 MHz		2380		pF	
Output Capacitance	C _{oss}			340			
Reverse Transfer Capacitance	C _{rss}			280			
Total Gate Charge	Q _g	V _{DS} = - 10 V, V _{GS} = - 8 V, I _D = - 5 A		45	70	nC	
		V _{DS} = - 10 V, V _{GS} = - 4.5 V, I _D = - 5 A		20	35		
					3.1		
					8.4		
Gate-Source Charge	Q _{gs}						
Gate-Drain Charge	Q _{gd}						
Gate Resistance	R _g	f = 1 MHz	1.0	4.8	9.6	Ω	
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 10 V, R _L = 2 Ω I _D ≅ - 5 A, V _{GEN} = - 8 V, R _g = 1 Ω		7	14	ns	
Rise Time	t _r			9	18		
Turn-Off DelayTime	t _{d(off)}			108	200		
Fall Time	t _f			41	80		
Turn-On Delay Time	t _{d(on)}	V _{DD} = - 10 V, R _L = 2 Ω I _D ≅ - 5 A, V _{GEN} = - 4.5 V, R _g = 1 Ω		14	28		
Rise Time	t _r			16	32		
Turn-Off DelayTime	t _{d(off)}			101	200		
Fall Time	t _f			40	80		
Drain-Source Body Diode Characteristics							
Continous Source-Drain Diode Current	I _S	T _C = 25 °C			- 4.1	A	
Pulse Diode Forward Current	I _{SM}				- 40		
Body Diode Voltage	V _{SD}	I _S = - 3 A, V _{GS} = 0 V		- 0.66	- 1.2	V	
Body Diode Reverse Recovery Time	t _{rr}	I _F = - 2.3 A, dl/dt = 100 A/μs, T _J = 25 °C		81	150	ns	
Body Diode Reverse Recovery Charge	Q _{rr}			150	300	nC	
Reverse Recovery Fall Time	t _a			43		ns	
Reverse Recovery Rise Time	t _b			38			

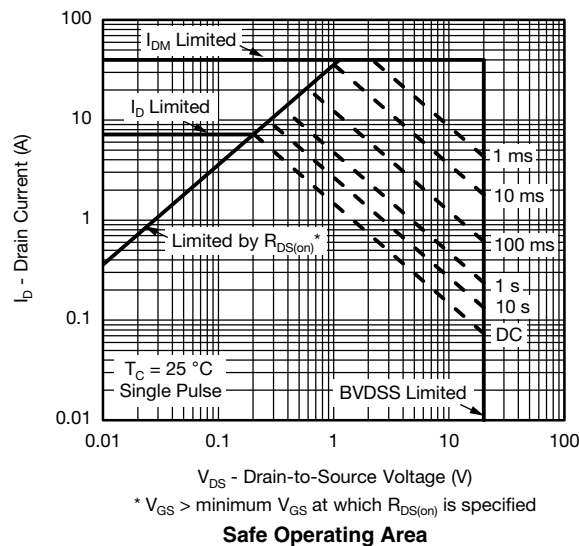
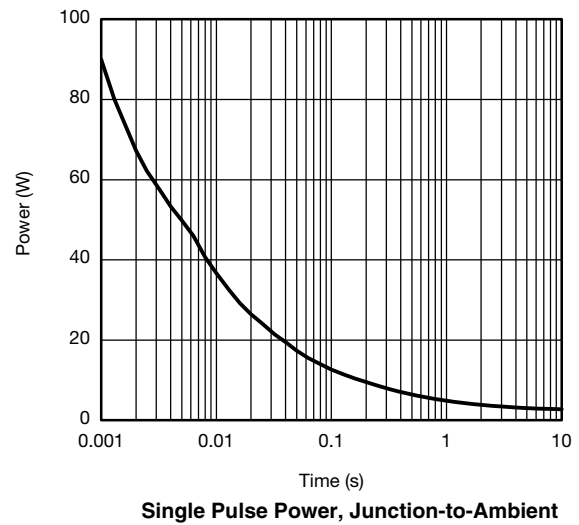
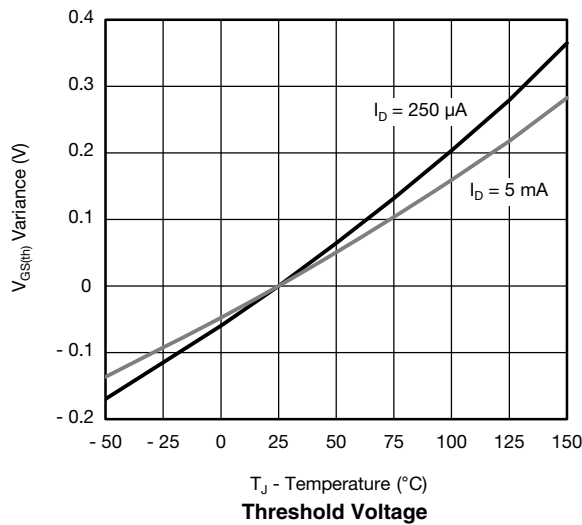
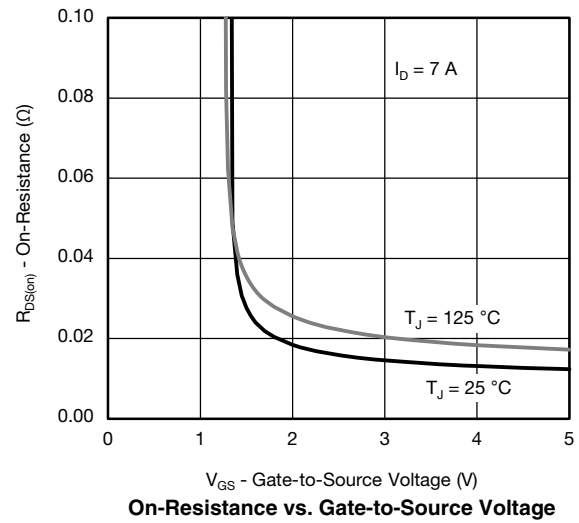
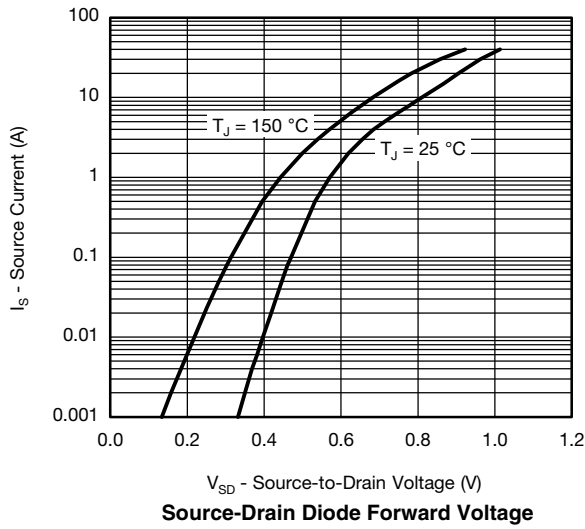
Notes:

a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.

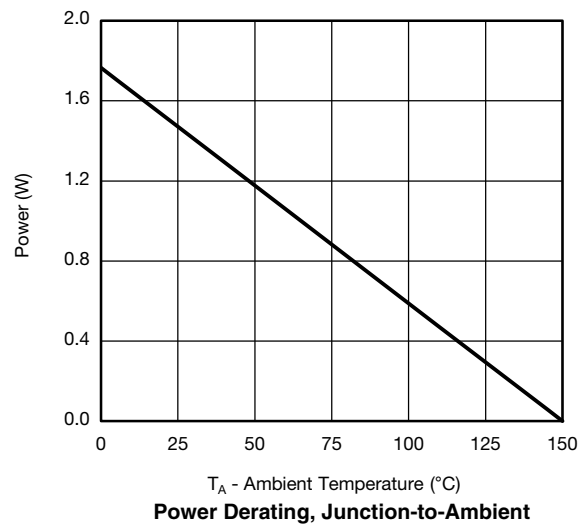
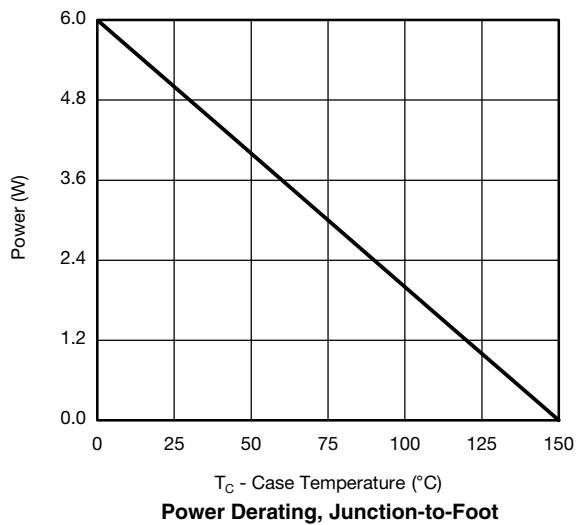
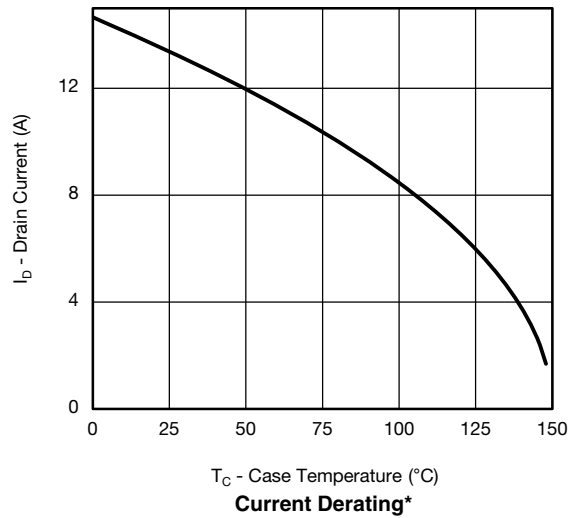
b. Guaranteed by design, not subject to production testing.

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

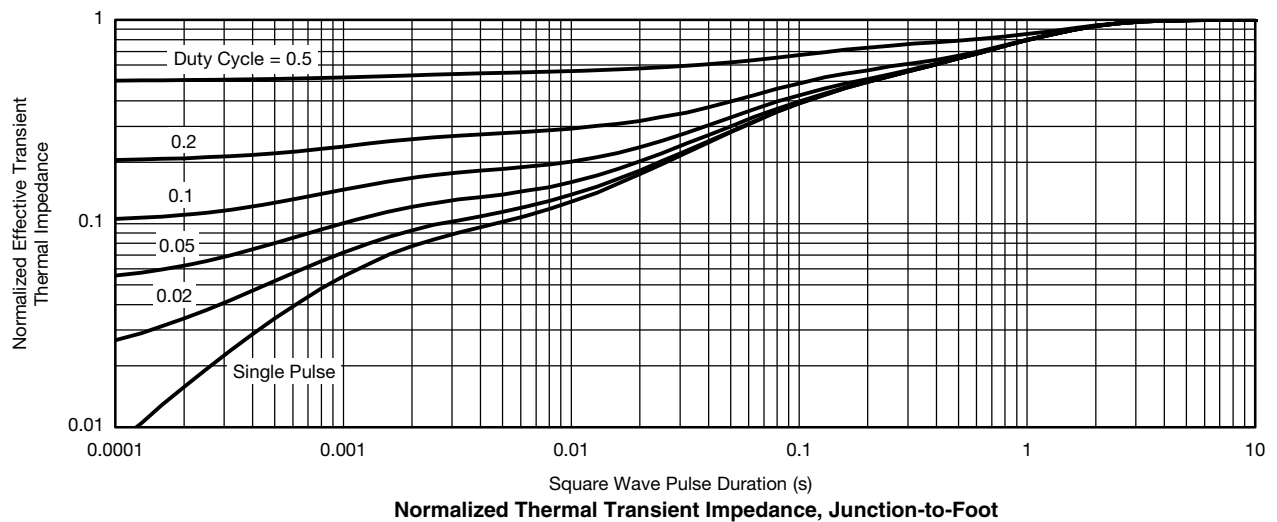
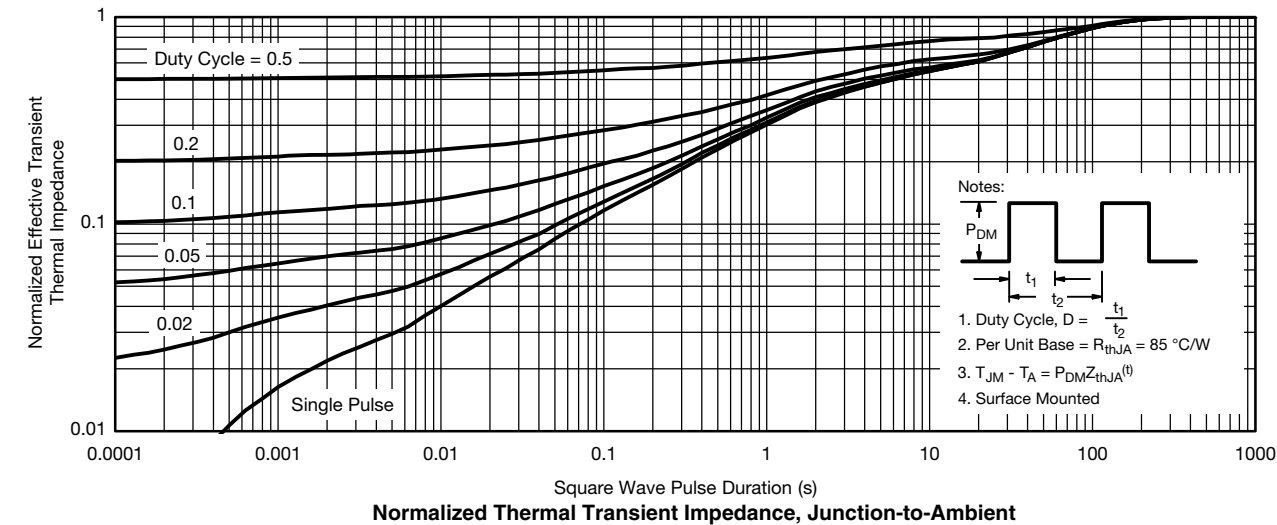
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


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

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)


* 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)



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