

P-Channel Enhancement Mode Field Effect Transistor

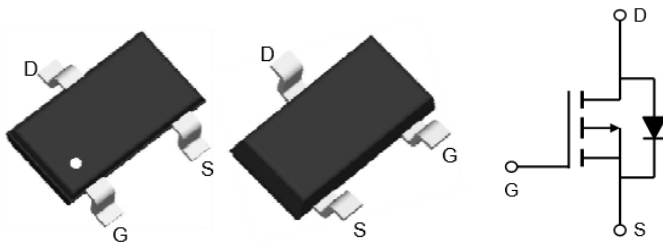
● **Features**

V_{DS}	$R_{DS(ON)TYP}$	I_D
-20V	29 mΩ@-4.5V	-7A
	34 mΩ@-2.5V	

● **General Description**

- load switch
- other general applications

● **Pin Configurations**



SOT-23

● **Absolute Maximum Ratings @ $T_A=25^{\circ}C$ unless otherwise noted**

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	-20	V
Gate-Source Voltage		V_{GSS}	± 12	V
Drain Current (Continuous) *AC	$T_A=25^{\circ}C$	I_D	-7.0	A
	$T_A=70^{\circ}C$		-4.9	
Drain Current (Pulse) *B		I_{DM}	-20	A
Power Dissipation	$T_A=25^{\circ}C$	P_D	1.7	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	$^{\circ}C$

● **Thermal Resistance Ratings**

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	$t \leq 5s$	R_{thJA}	78	100	$^{\circ}C/W$

Electrical Characteristics

$T_A=25^{\circ}\text{C}$ unless otherwise noted

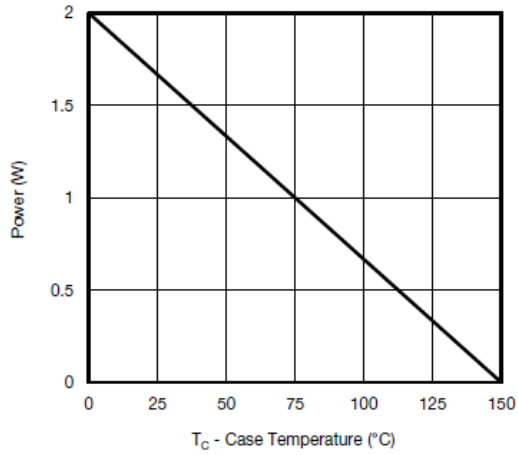
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-20	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$	--	--	-1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250\mu A$	-0.4	-0.6	-1.2	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -5A$	--	29	40	m Ω
	$R_{DS(on)}$	$V_{GS} = -2.5V, I_D = -2A$	--	34	50	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = -5V, I_D = -4A$	--	8	--	S
Diode Forward Voltage	V_{SD}	$I_{SD} = -1A, V_{GS} = 0V$	--	--	-1.2	V
Diode Forward Current	I_S	$T_C = 25^{\circ}\text{C}$	--	--	-4	A
Switching						
Total Gate Charge	Q_g	$V_{GS} = -4.5V, V_{DS} = -10V,$ $I_D = -4.5A$	--	13.8	--	nC
Gate-Source Charge	Q_{gs}		--	1.9	--	nC
Gate-Drain Charge	Q_{gd}		--	3	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DS} = -10V, R_L = 2.8\Omega$ $I_D = -3.6A, V_{GS} = -4.5V$ $R_G = 1\Omega$	--	22	--	ns
Turn-on Rise Time	t_r		--	21	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	62	--	ns
Turn-Off Fall Time	t_f		--	14	--	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = -10V, f = 1.0\text{MHz}$	--	1200	--	pF
Output Capacitance	C_{oss}		--	120	--	pF
Reverse Transfer Capacitance	C_{rss}		--	117	--	pF

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

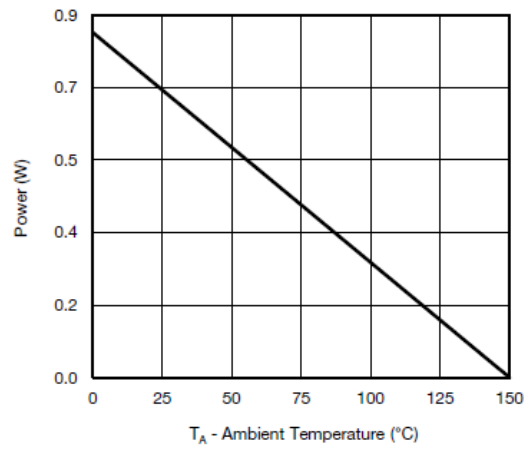
B: Repetitive rating, pulse width limited by junction temperature.

C: The current rating is based on the $t \leq 10\text{s}$ junction to ambient thermal resistance rating.

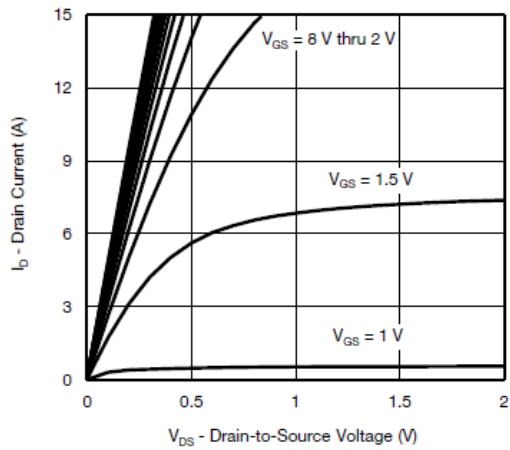
Typical Electrical and Thermal Characteristics



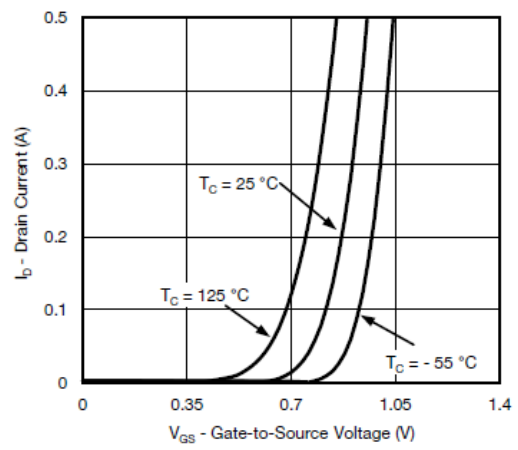
Power Junction-to-Case



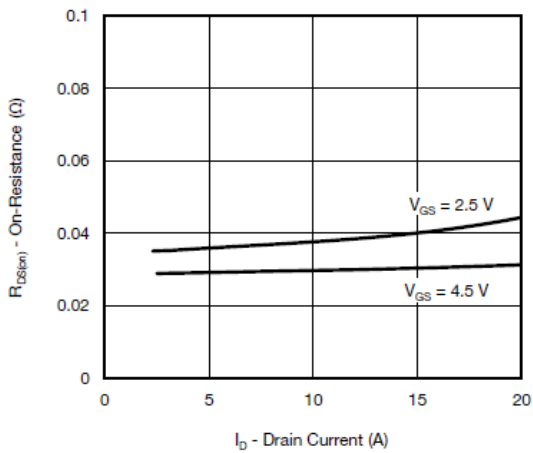
Power Junction-to-Ambient



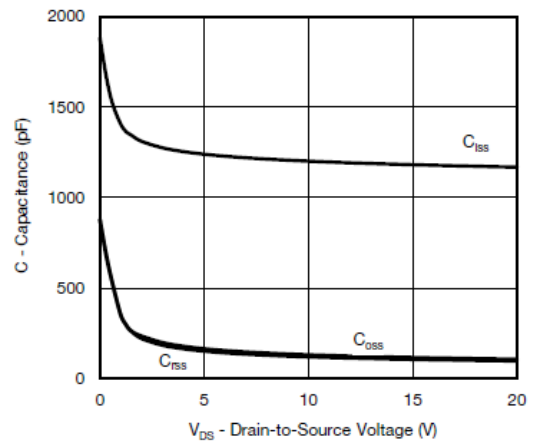
Output Characteristics



Transfer Characteristics

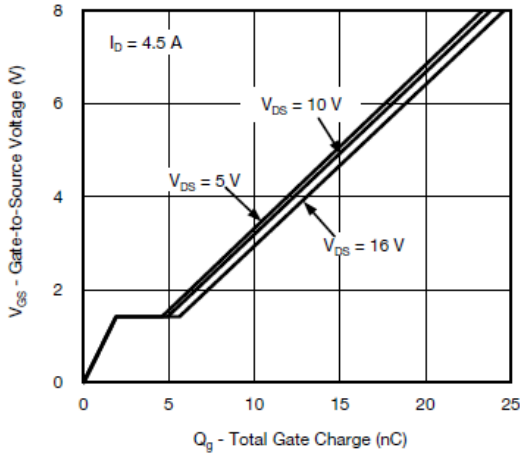


On-Resistance vs. Drain Current

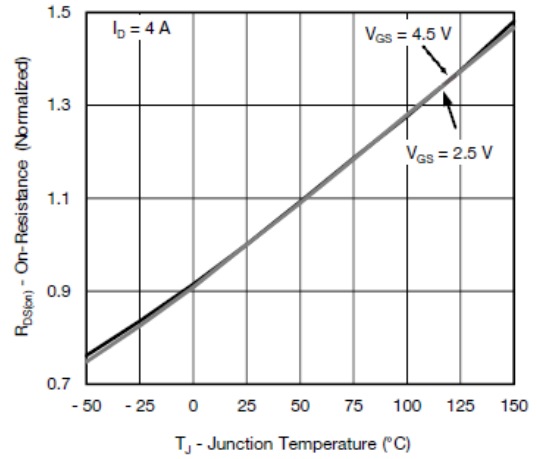


Capacitance

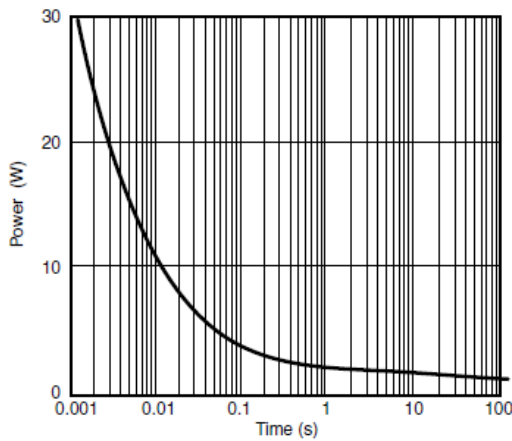
Typical Electrical and Thermal Characteristics



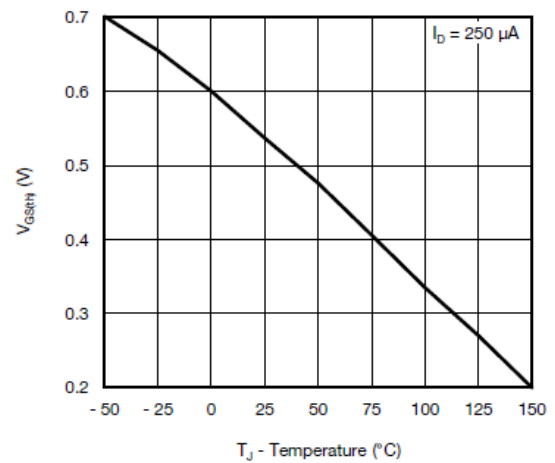
Gate Charge



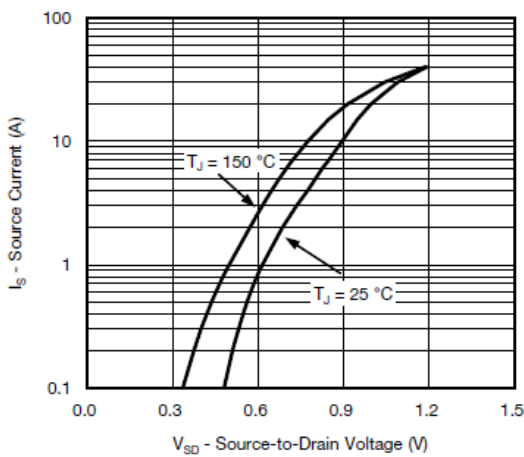
On-Resistance vs. Junction Temperature



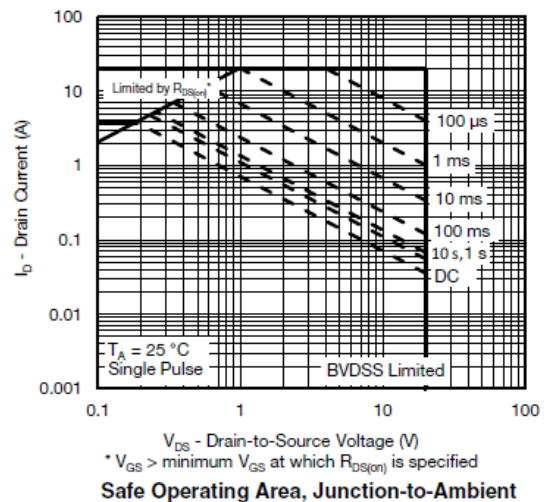
Single Pulse Power, Junction-to-Ambient



Threshold Voltage

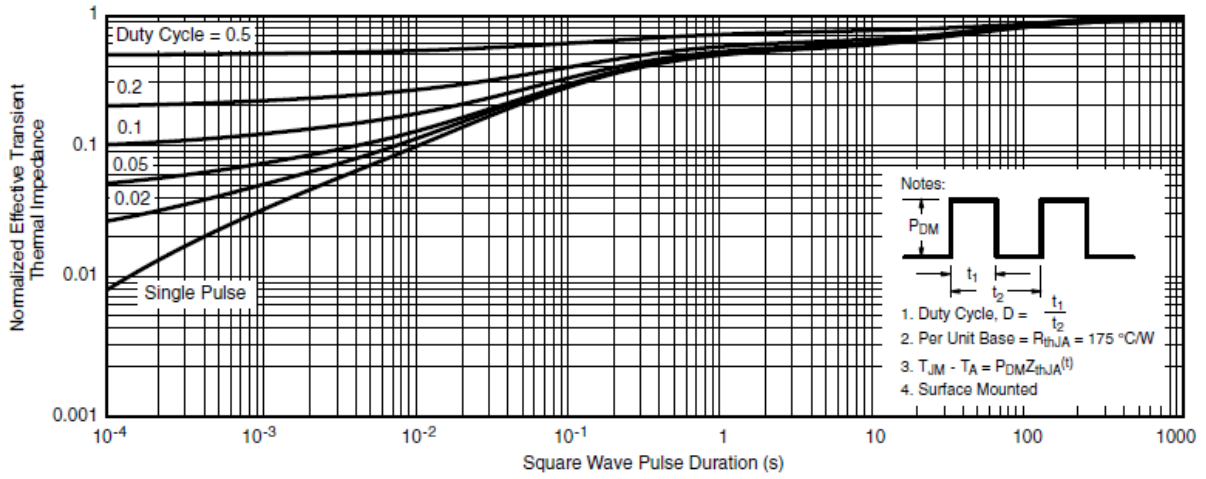


Source-Drain Diode Forward Voltage

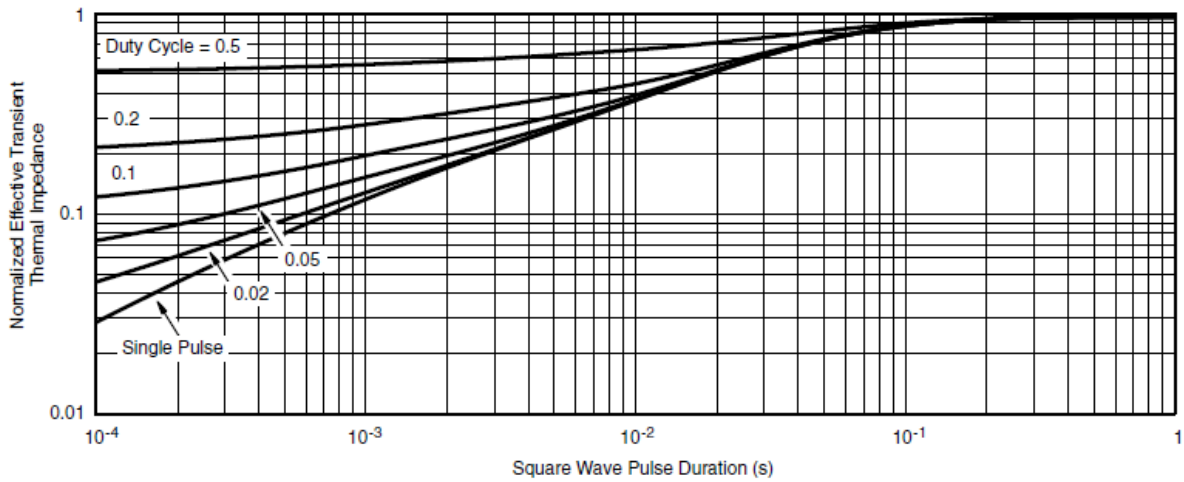


Safe Operating Area, Junction-to-Ambient

Typical Electrical and Thermal Characteristics

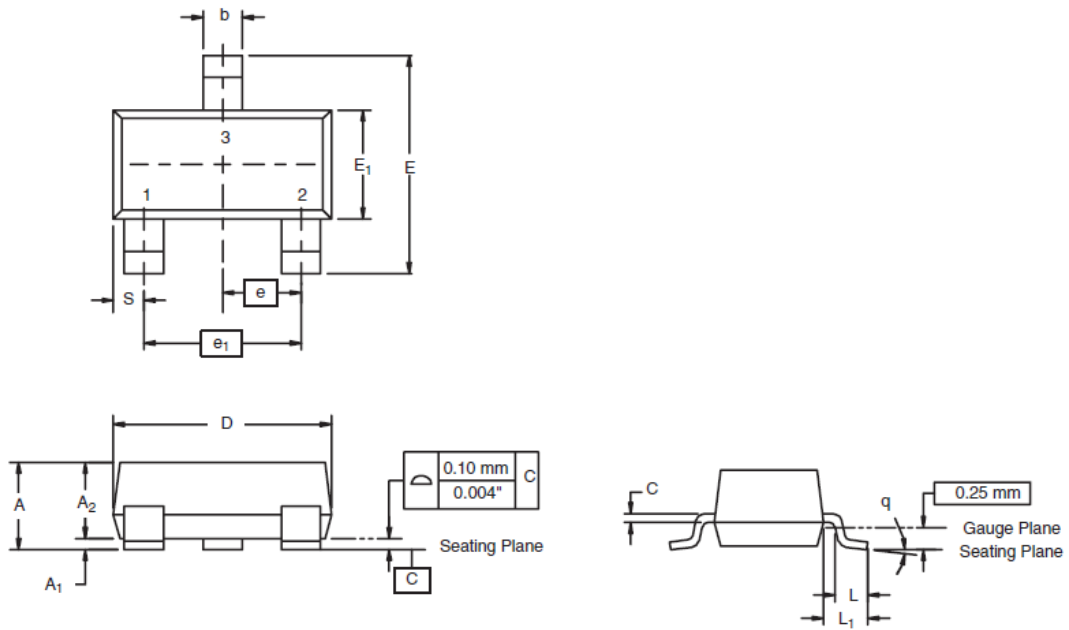


Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

Package Information



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A ₁	0.01	0.10	0.0004	0.004
A ₂	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E ₁	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e ₁	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L ₁	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°