

N-Channel Enhancement Mode Power MOSFET

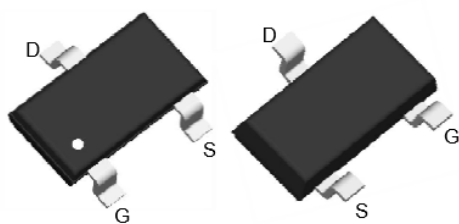
● Features

V_{DS}	$R_{DS(ON)TYP}$	I_D
20V	21 mΩ@4.5V	6A
	28 mΩ@2.5V	

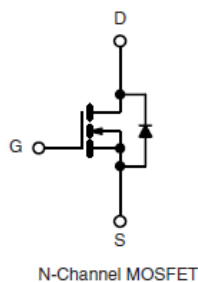
● General Description

- load switch for Portable Applications
- DC/DC Converters

● Pin Configurations



SOT-23



● Absolute Maximum Ratings @ $T_A=25^{\circ}\text{C}$ 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	$T_A=25^{\circ}\text{C}$	I_D	6	A
	$T_A=70^{\circ}\text{C}$		4	
Drain Current (Pulse) *B		I_{DM}	25	A
Power Dissipation	$T_A=25^{\circ}\text{C}$	P_D	1.25	W
Operating Temperature/ Storage Temperature		T_J/T_{STG}	-55~150	$^{\circ}\text{C}$

● Thermal Resistance Ratings

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient	$t \leq 5s$	R_{thJA}	80	100	$^{\circ}\text{C/W}$

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	0.66	1.2	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 4A$	--	21	28	m Ω
	$R_{DS(on)}$	$V_{GS} = 2.5V, I_D = 3A$	--	28	38	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = 10V, I_D = 4A$	10	--	--	S
Diode Forward Voltage	V_{SD}	$I_{SD} = 1A, V_{GS} = 0V$	--	--	1.2	V
Diode Forward Current	I_S	$T_C = 25^{\circ}C$	--	--	1.4	A
Switching						
Total Gate Charge	Q_g	$V_{GS} = 4.5V, V_{DS} = 10V, I_D = 4.5A$	--	7.7	--	nC
Gate-Source Charge	Q_{gs}		--	1	--	nC
Gate-Drain Charge	Q_{gd}		--	1	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 10V, R_G = 1\Omega$ $I_D = 3.6A, V_{GS} = 8V$	--	4	--	ns
Turn-on Rise Time	t_r		--	22	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	16	--	ns
Turn-Off Fall Time	t_f		--	9	--	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 10V, f = 1.0MHz$	--	735	--	pF
Output Capacitance	C_{oss}		--	110	--	pF
Reverse Transfer Capacitance	C_{rss}		--	40	--	pF

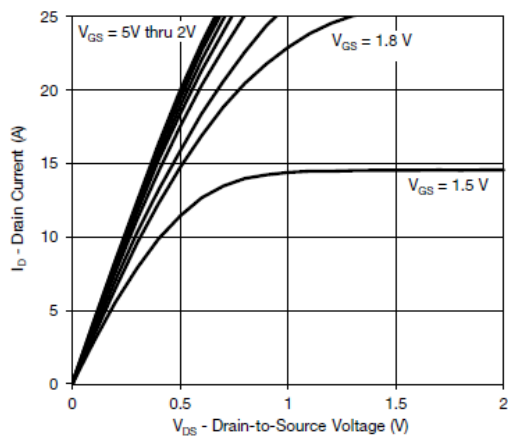
A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}\text{C}$. The value in any given application depends on the user's specific board design.

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

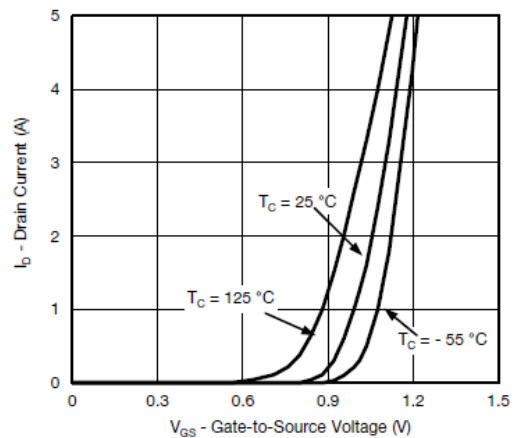
C: The current rating is based on the $\leq 10\text{s}$ junction to ambient thermal resistance rating.

Typical Electrical and Thermal Characteristics

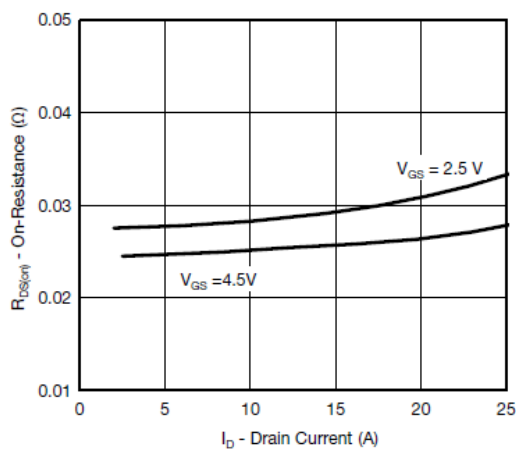
$T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted



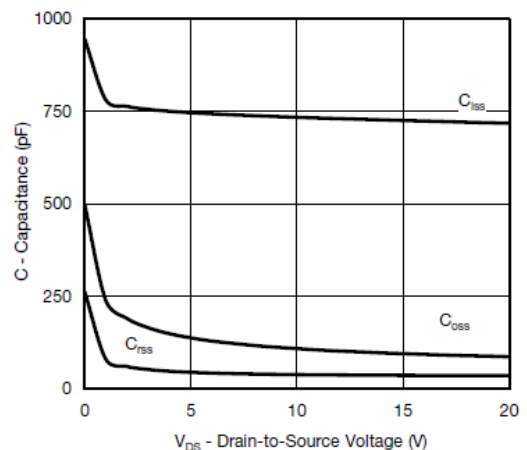
Output Characteristics



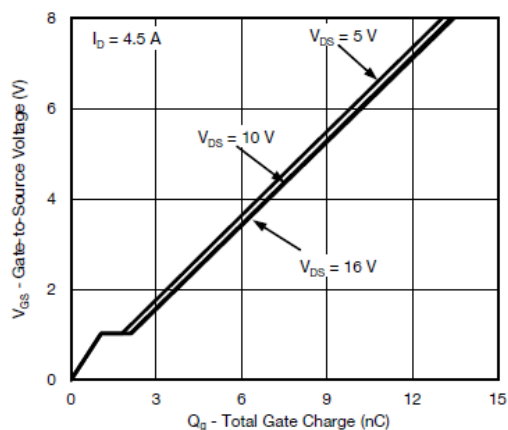
Transfer Characteristics



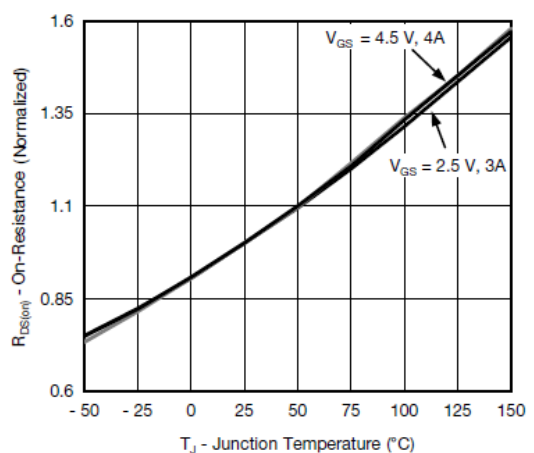
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

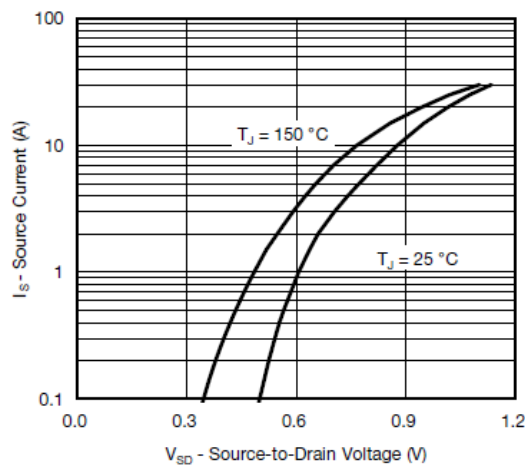


Gate Charge

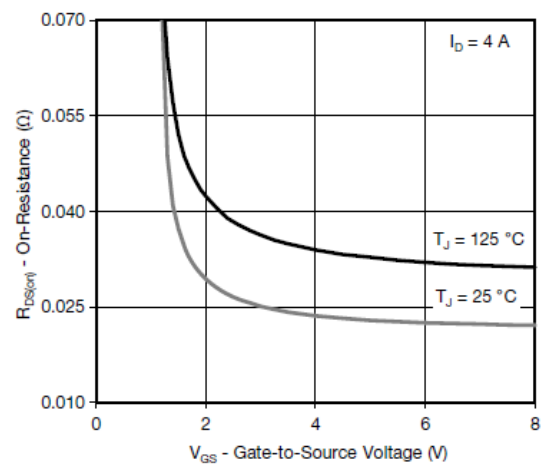


On-Resistance vs. Junction Temperature

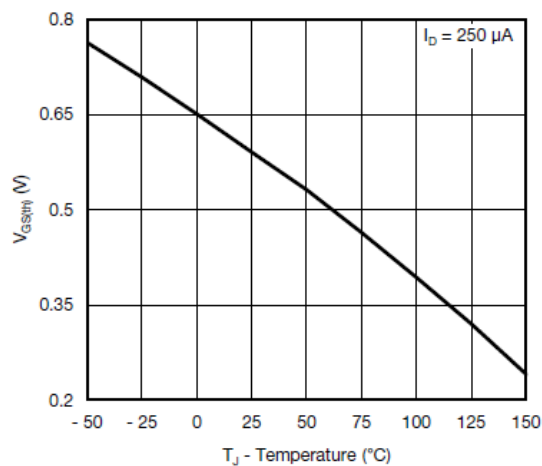
Typical Electrical and Thermal Characteristics



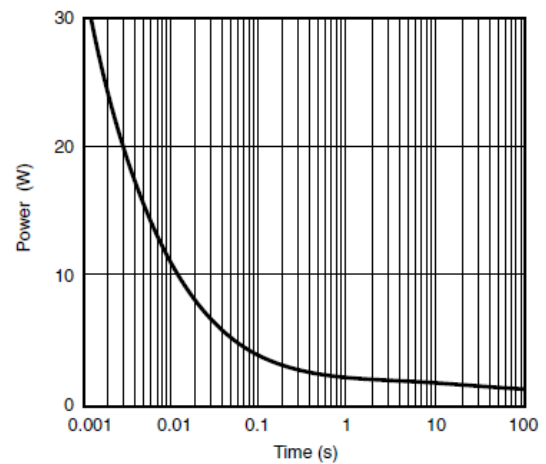
Source-Drain Diode Forward Voltage



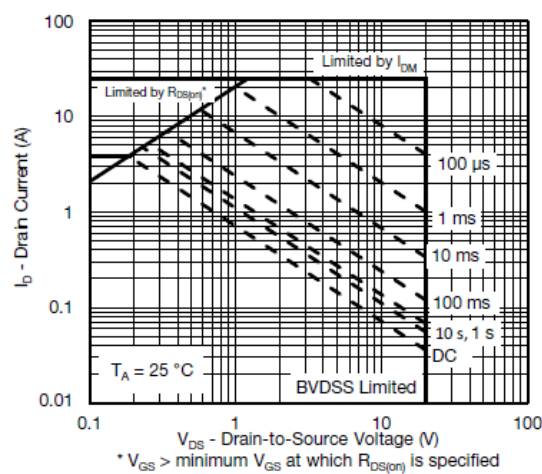
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

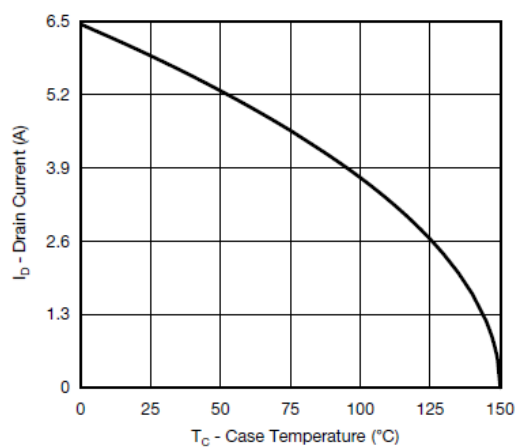


Single Pulse Power (Junction-to-Ambient)

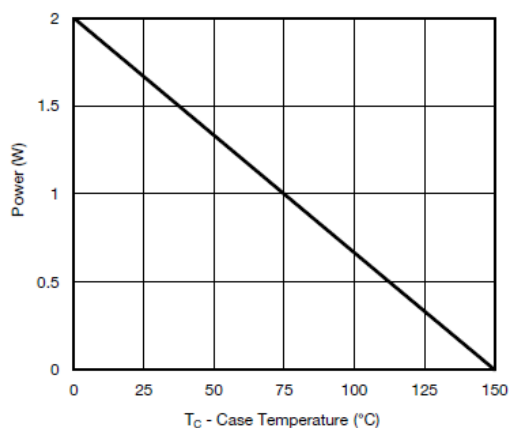


Safe Operating Area, Junction-to-Ambient

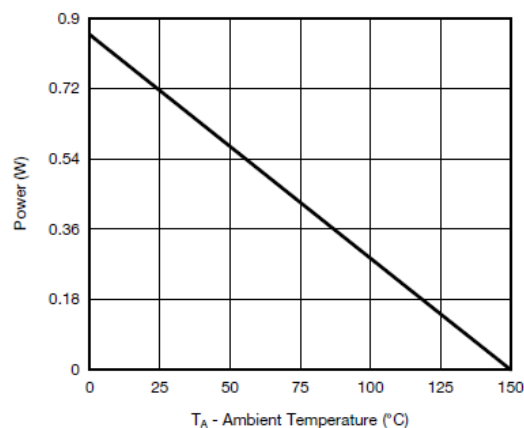
Typical Electrical and Thermal Characteristics



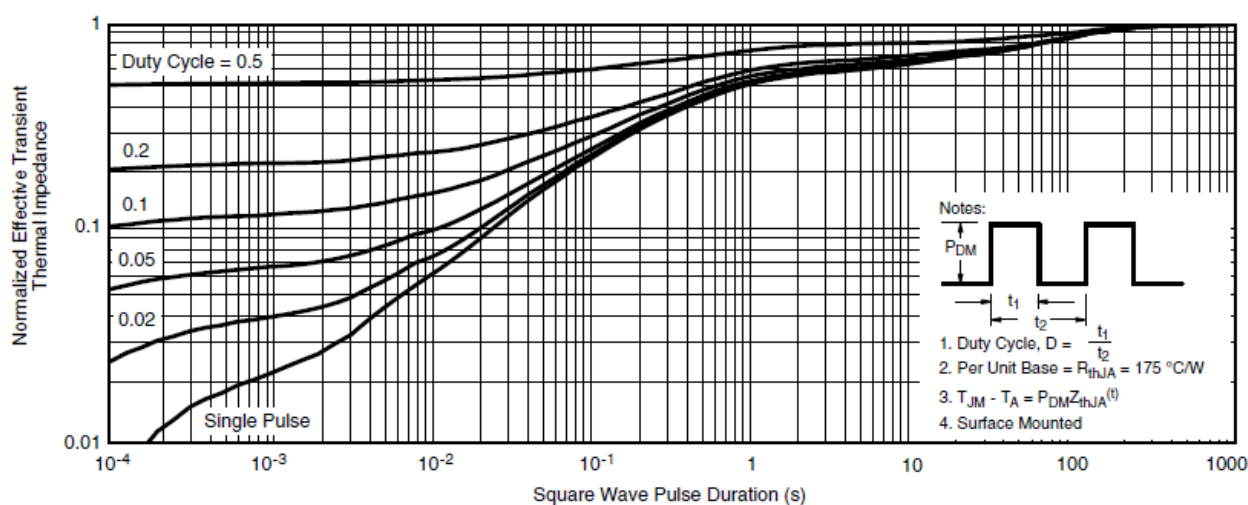
Current Derating*



Power Junction-to-Foot

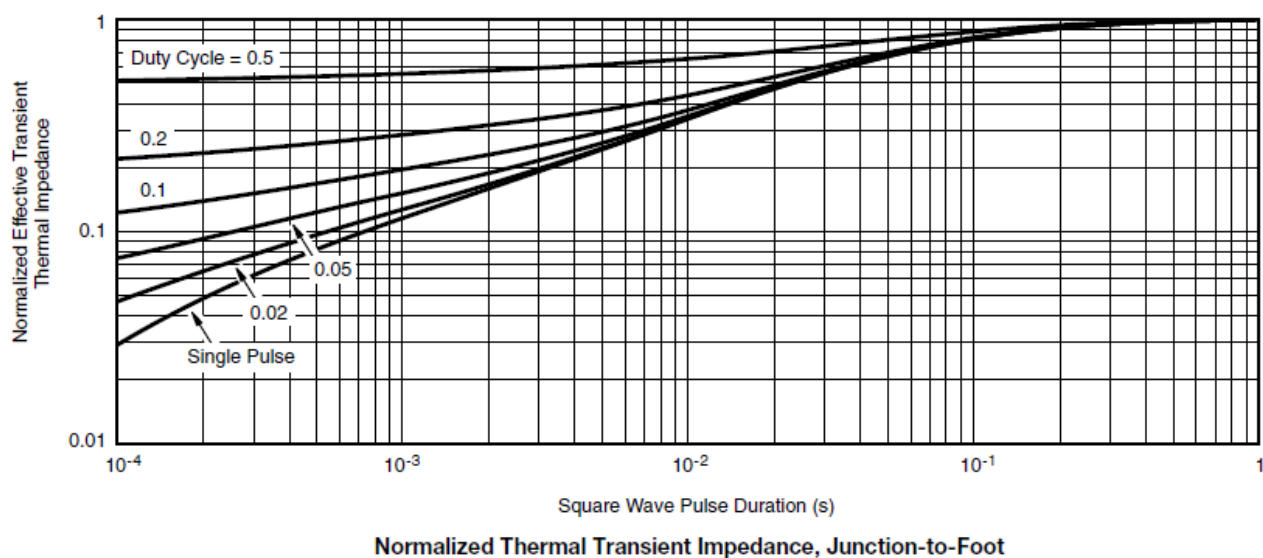


Power Junction-to-Ambient

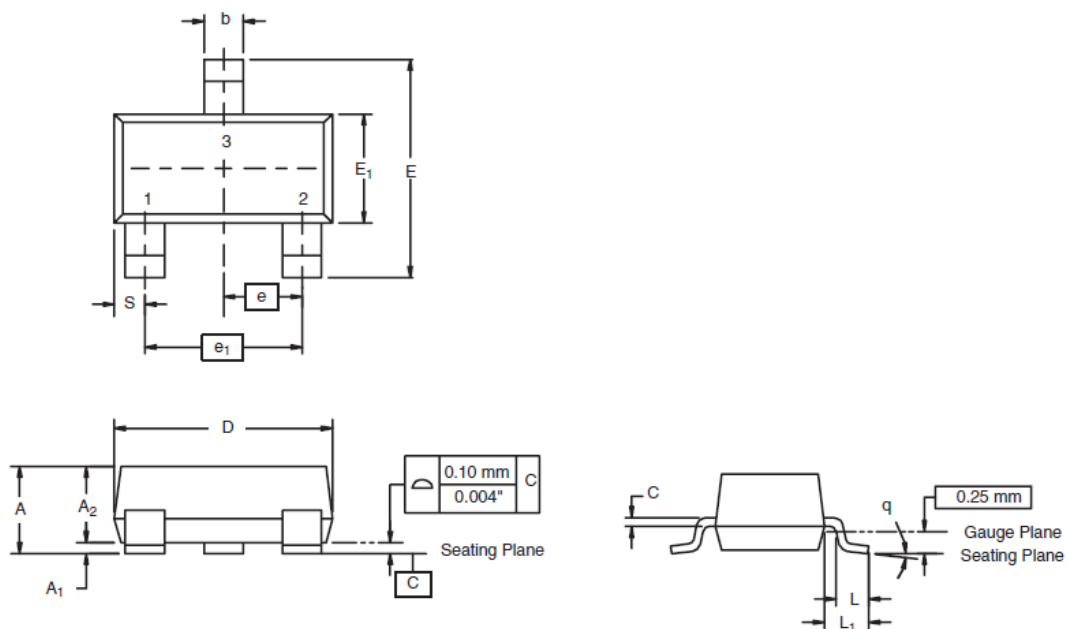


Normalized Thermal Transient Impedance, Junction-to-Ambient

Typical Electrical and Thermal Characteristics



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°