

P-Channel Enhancement Mode Power MOSFET

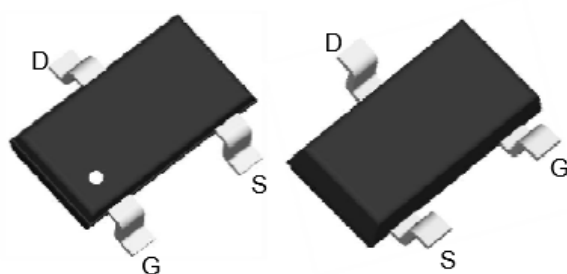
● Features

V_{DS}	$R_{DS(ON)TYP}$	I_D
-40V	40 mΩ@-10V	-3.7A
	54 mΩ@-4.5V	

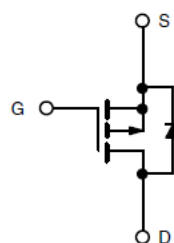
● General Description

- Battery switch
- Load switch

● Pin Configurations



SOT23-3



P-Channel MOSFET

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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DSS}	-40	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current (Continuous) *AC	$T_A=25^{\circ}\text{C}$	I_D	-3.7	A
	$T_A=70^{\circ}\text{C}$		-3	
Drain Current (Pulse) *B		I_{DM}	14.8	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

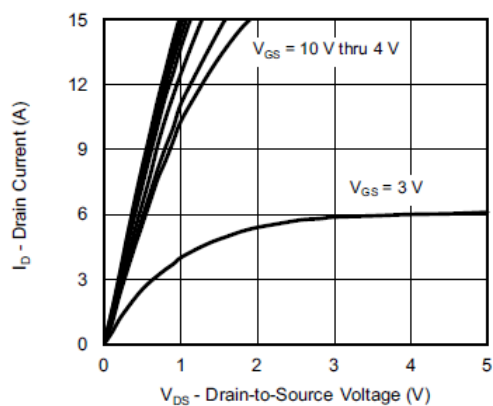
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250 \mu A$	-40	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40 V, V_{GS} = 0V$	--	--	1	μA
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_{DS} = -250 \mu A$	-1.3	-1.6	-2.7	V
Gate Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$	--	--	± 100	nA
Drain-Source On-state Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4A$	--	40	52	m Ω
	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3A$	--	54	70	m Ω
Forward Transconductance	g_{FS}	$V_{DS} = -15V, I_D = -2.7A$	--	10	--	S
Diode Forward Voltage	V_{SD}	$I_{SD} = -2.2A, V_{GS} = 0V$	--	--	-1.2	V
Diode Forward Current	I_S	$T_A = 25^{\circ}C$	--	--	-3.7	A
Switching						
Total Gate Charge	Q_g	$V_{DS} = -20 V, V_{GS} = -4.5 V,$ $I_D = -2.7 A$	--	6	--	nC
Gate-Source Charge	Q_{gs}		--	1.8	--	nC
Gate-Drain Charge	Q_{gd}		--	2	--	nC
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -20 V, R_L = 9.1 \Omega, I_D \cong -2.2 A,$ $V_{GEN} = -10 V, R_g = 1 \Omega$	--	10	--	ns
Turn-on Rise Time	t_r		--	20	--	ns
Turn-off Delay Time	$t_{d(off)}$		--	20	--	ns
Turn-Off Fall Time	t_f		--	12	--	ns
Dynamic						
Input Capacitance	C_{iss}	$V_{DS} = -20 V, V_{GS} = 0 V, f = 1 MHz$	--	650	--	pF
Output Capacitance	C_{oss}		--	54	--	pF
Reverse Transfer Capacitance	C_{rss}		--	43	--	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.

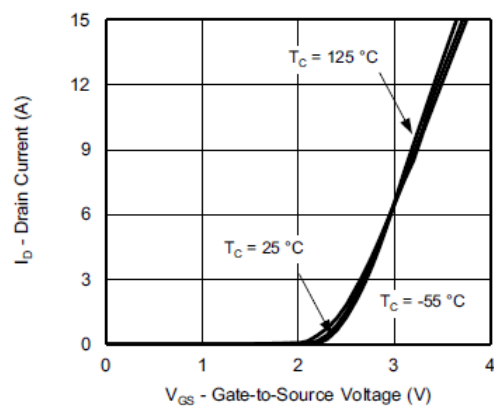
B: Repetitive rating, pulse width limited by junction temperature.

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

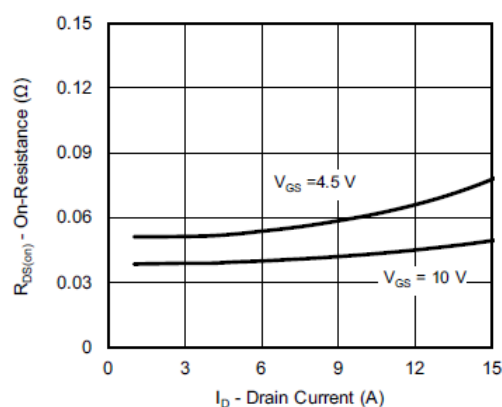
Typical Electrical and Thermal Characteristics



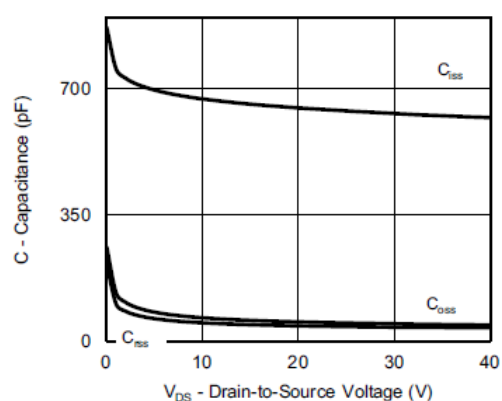
Output Characteristics



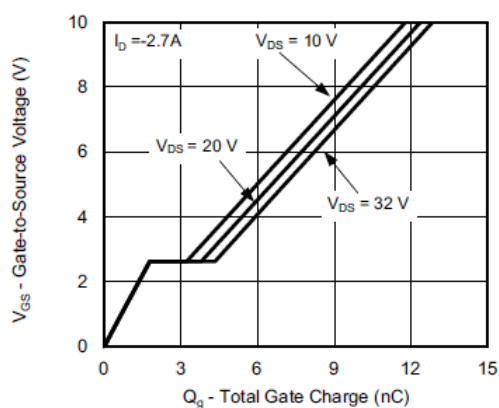
Transfer Characteristics



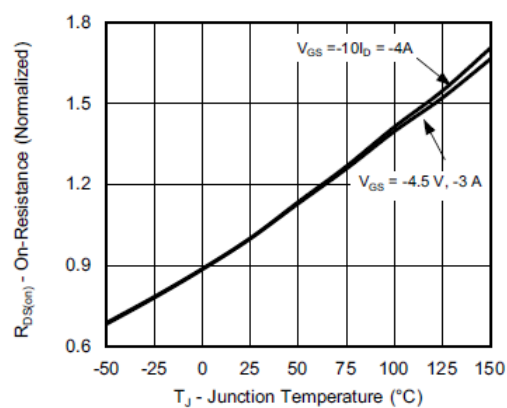
On-Resistance vs. Drain Current and Gate Voltage



Capacitance

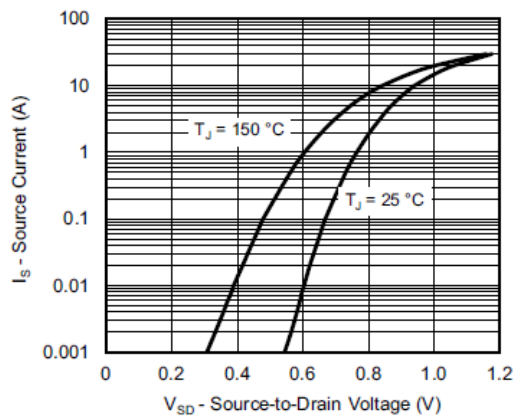


Gate Charge

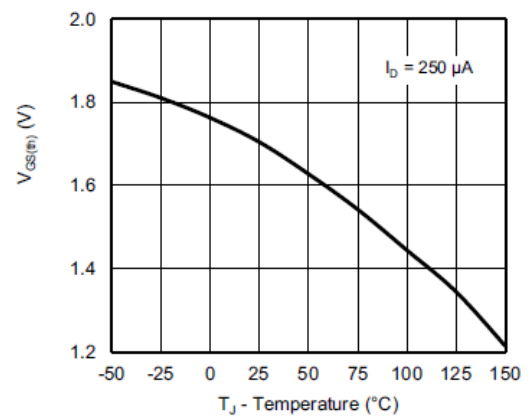


On-Resistance vs. Junction Temperature

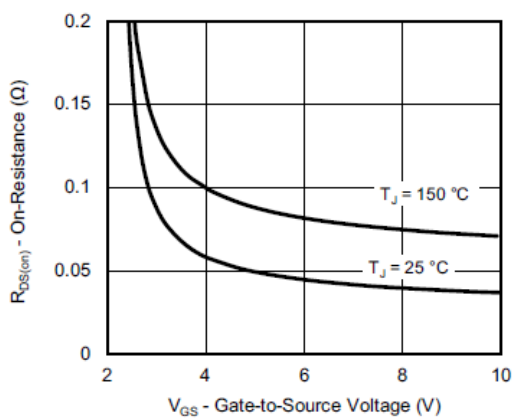
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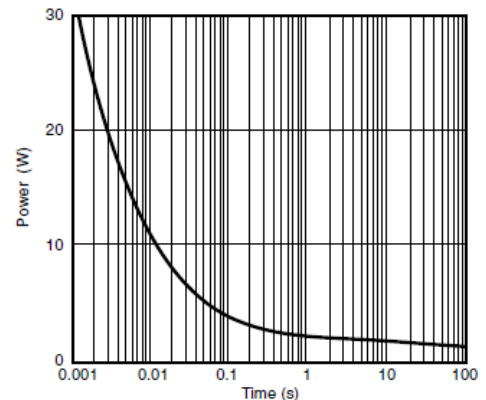
Source-Drain Diode Forward Voltage



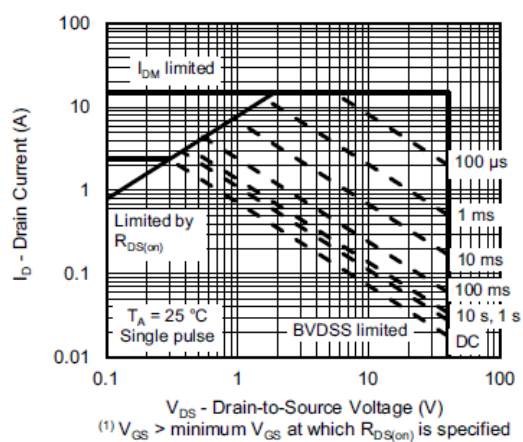
Threshold Voltage



On-Resistance vs. Gate-to-Source Voltage

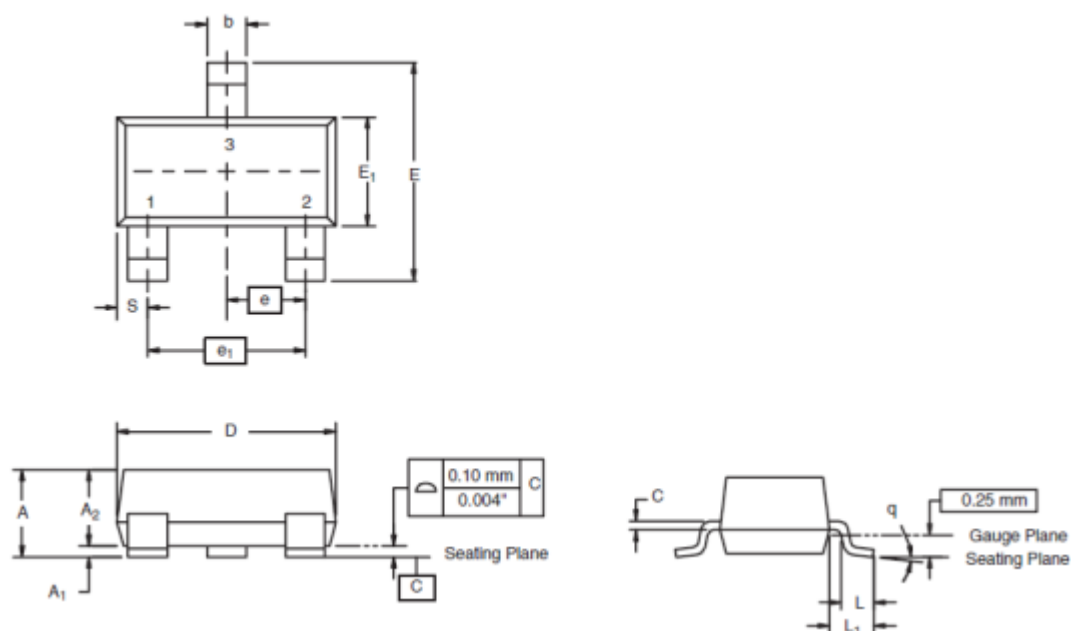


Single Pulse Power, Junction-to-Ambient



Safe Operating Area, Junction-to-Ambient

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	2.60	3.00	0.102	0.118
E ₁	1.40	1.80	0.055	0.071
e	0.95 BSC		0.0374 Ref	
ϕ_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°