-20V P-Channel Mosfet

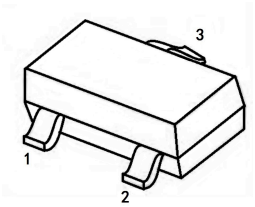
FEATURES

- $R_{DS(ON)}$≤38mΩ(30mΩ Typ.) @V_{GS}=-4.5V
- $R_{DS(ON)}$≤52mΩ(38mΩ Typ.) @V_{GS}=-2.5V

APPLICATIONS

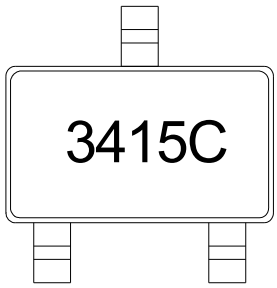
- PWM Applications
- Load Switch
- Power Management

SOT-23



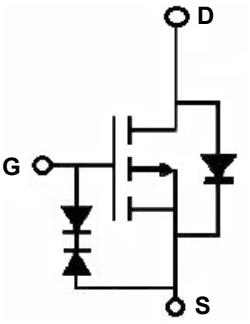
1. GATE
2. SOURCE
3. DRAIN=

MARKING



Other marks: "R15"

P-CHANNEL MOSFET



MAXIMUM RATINGS (Ta=25°C unless otherwise noted)

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	±12	V
I_D	Continuous Drain Current	-5	A
I_{DM}	Pulsed Drain Current note1	- 20	A
P_D	Power Dissipation	2.1	W
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	70	℃/W
T_J	Junction Temperature	150	℃
T_{STG}	Storage Temperature Range	-55 to +150	℃

MOSFET ELECTRICAL CHARACTERISTICS Ta=25 °C unless otherwise specified

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS} = 0V,I_D = -250μA	-20	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS} = -20V,V_{GS} = 0V	-	-	-1	μA
I_{GSS}	Gate to Body Leakage Current	V_{GS} = ±12V,V_{DS} = 0V	-	-	±10	μA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} =V_{GS},I_D = -250μA	-0.4	-0.7	-1.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance note2	V_{GS} =-4.5V, I_D =-4A	-	30	38	mΩ
		V_{GS} =-2.5V, I_D =-3A	-	38	52	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS} =-10V, V_{GS} = 0V f = 1.0MHz	-	1030	-	pF
C_{oss}	Output Capacitance		-	180	-	pF
C_{rss}	Reverse Transfer Capacitance			130	-	pF
Q_g	Total Gate Charge	V_{DS}=-10V, I_D=-5A, V_{GS}=-4.5V	-	13	-	nC
Q_{gs}	Gate-Source Charge		-	1.5	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	3.6	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{GS} = -4.5V, V_{DS}=-10V R_G =3Ω, R_L =2Ω	-	12	-	ns
t_r	Turn-On Rise Time		-	10	-	ns
$t_{d(off)}$	Turn-Off Delay Time		-	19	-	ns
t_f	Turn-Off Fall Time		-	25	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	-5	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS} = 0V, I_S=-5A,	-	-	-1.2	V

Notes: 1. Repetitive Rating: Pulse width limited by maximum junction temperature

2 . Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 2%

TYPICAL PERFORMANCE CHARACTERISTICS

Figure1: Output Characteristics

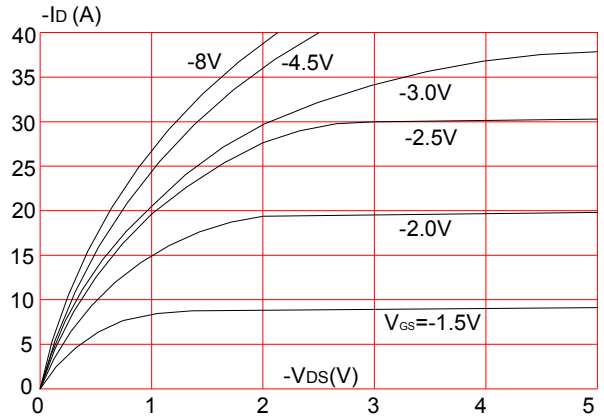


Figure 2: Typical Transfer Characteristics

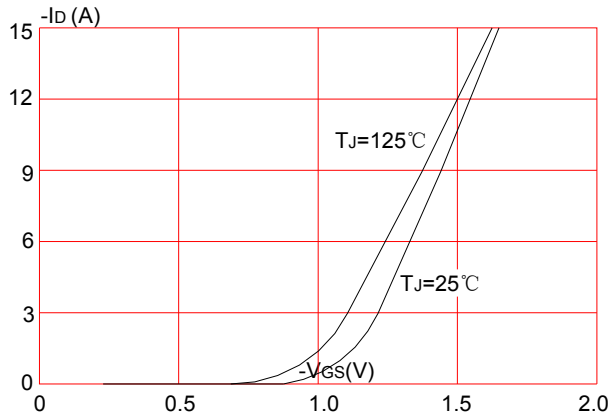


Figure 3: On-resistance vs. Drain Current

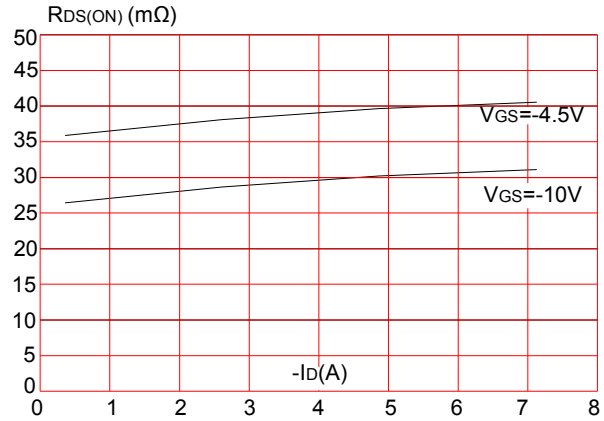


Figure 4: Body Diode Characteristics

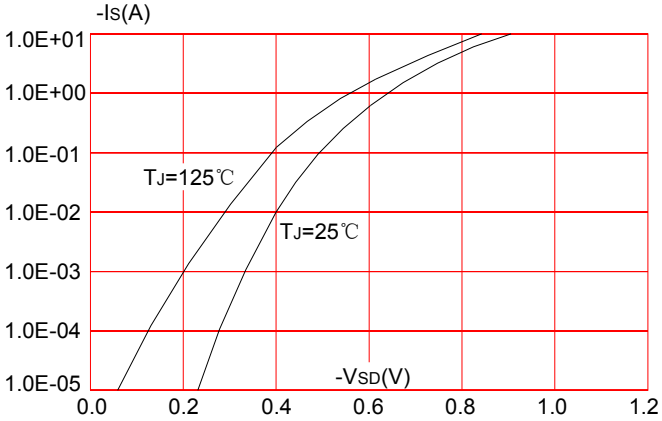


Figure 5: Gate Charge Characteristics

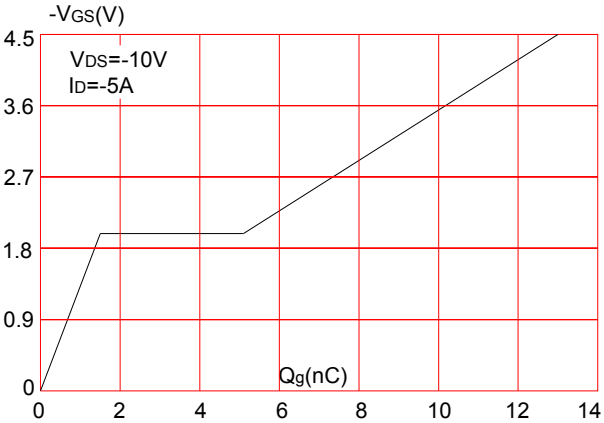
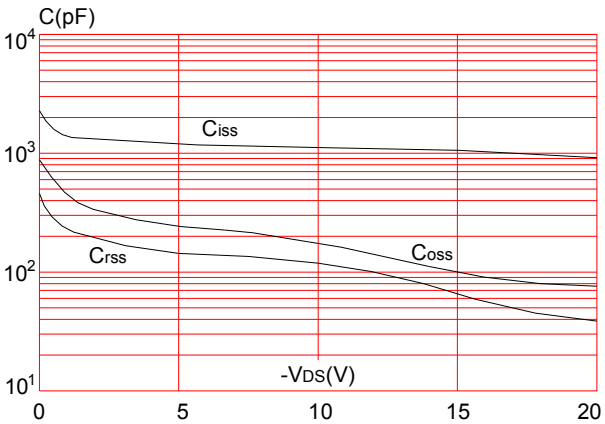


Figure 6: Capacitance Characteristics



TYPICAL PERFORMANCE CHARACTERISTICS (cont.)

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

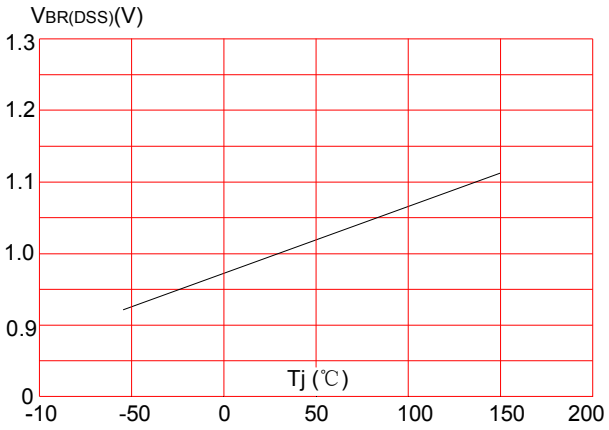


Figure 8: Normalized on Resistance vs. Junction Temperature

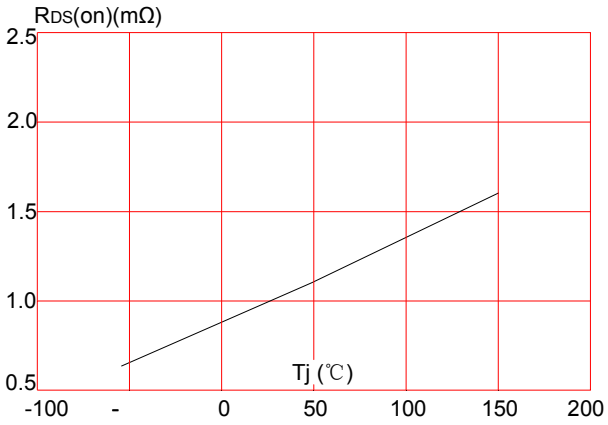


Figure 9: Maximum Safe Operating Area

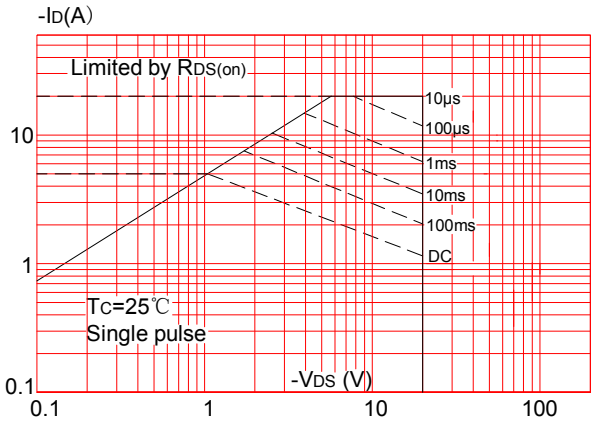


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

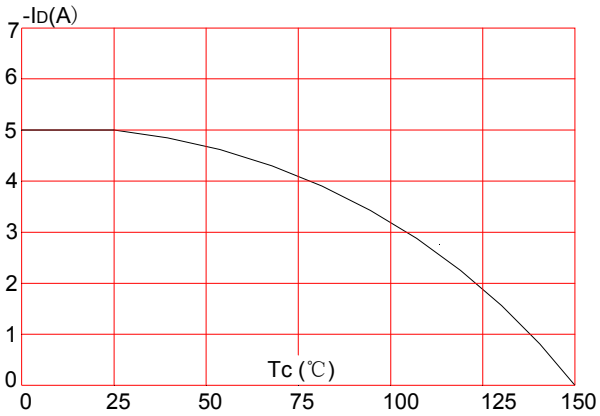
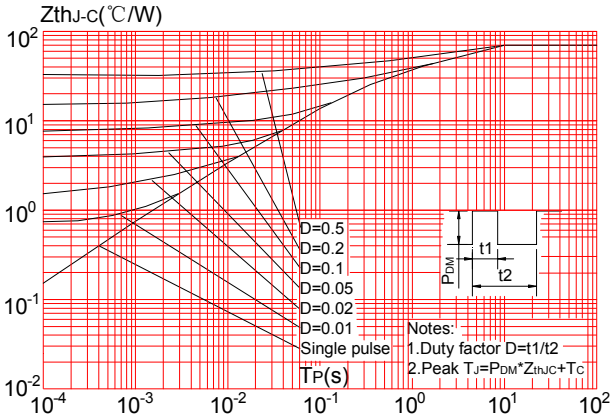
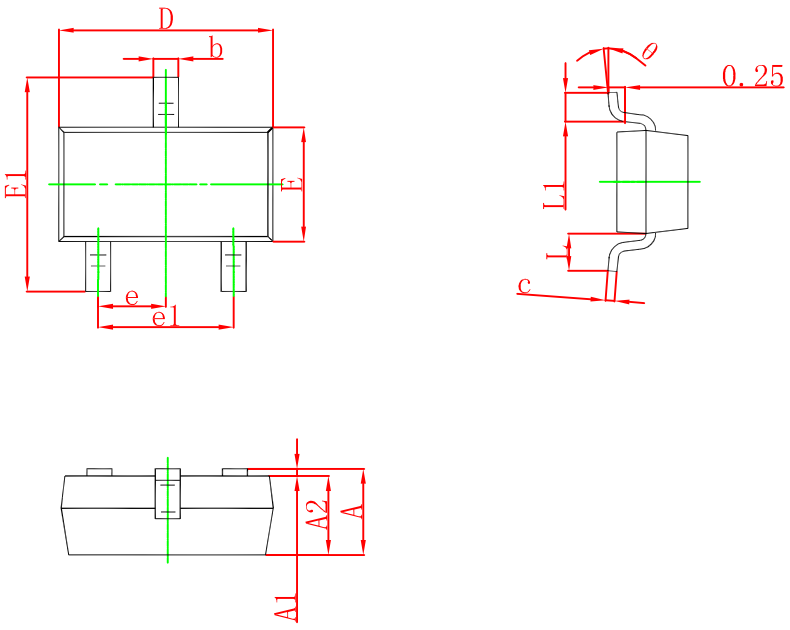


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient (SOT-23)



SOT-23 PACKAGE OUTLINE DRAWING



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°