P-Ch 20V Fast Switching MOSFETS

Product Summary

BVDSS	RDSON	ID
-20V	36mΩ	- 4A
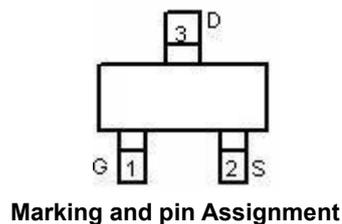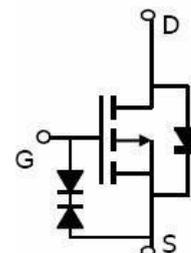
★ Super Low Gate Charge
★ Green Device Available
★ Excellent CdV/dt effect decline
★ Advanced high cell density Trench technology

Marking and pin Assignment

SOT-23 top view

Absolute Maximum Ratings

Symbol	Parameter	Rating		Units
		10s	**Steady State**	
V_{DS}	Drain-Source Voltage	-20		V
V_{GS}	Gate-Source Voltage	±10		V
$I_D@T_A=25°C$	Continuous Drain Current, V_{GS} @ -4.5V[1]	-4.2	-4	A
$I_D@T_A=70°C$	Continuous Drain Current, V_{GS} @ -4.5V[1]	-4	-3.7	A
I_{DM}	Pulsed Drain Current[2]	-18		A
$P_D@T_A=25°C$	Total Power Dissipation[3]	1.32	1	W
T_{STG}	Storage Temperature Range	-55 to 150		°C
T_J	Operating Junction Temperature Range	-55 to 150		°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
$R_{θJA}$	Thermal Resistance Junction-Ambient [1]	---	125	°C/W
$R_{θJA}$	Thermal Resistance Junction-Ambient [1] (t ≤10s)	---	95	°C/W
$R_{θJC}$	Thermal Resistance Junction-Case[1]	---	80	°C/W

Electrical Characteristics (T$_J$=25℃ 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$_{DS}$ =0V, V$_{GS}$ = ±10V	-	-	±10	uA
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	40	mΩ
		V$_{GS}$ =-2.5V, I$_D$ =-3A	-	40	56	
Dynamic Characteristics						
C$_{iss}$	Input Capacitance	V$_{DS}$ = -10V, V$_{GS}$ = 0V, f = 1.0MHz	-	289	-	pF
C$_{oss}$	Output Capacitance		-	98	-	pF
C$_{rss}$	Reverse Transfer Capacitance		-	22	-	pF
Q$_g$	Total Gate Charge	V$_{DS}$ = -10V, I$_D$ = -4.1A, V$_{GS}$ = -4.5V	-	9	-	nC
Q$_{gs}$	Gate-Source Charge		-	1	-	nC
Q$_{gd}$	Gate-Drain("Miller") Charge		-	2.6	-	nC
Switching Characteristics						
t$_{d(on)}$	Turn-on Delay Time	V$_{DD}$ = -10V, R$_G$ = 1Ω, V$_{GEN}$=-4.5V,R$_L$=1.2Ω	-	12	-	ns
t$_r$	Turn-on Rise Time		-	35	-	ns
t$_{d(off)}$	Turn-off Delay Time		-	30	-	ns
t$_f$	Turn-off Fall Time		-	10	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I$_S$	Maximum Continuous Drain to Source Diode Forward Current		-	-	-4.1	A
I$_{SM}$	Maximum Pulsed Drain to Source Diode Forward Current		-	-	-16.4	A
V$_{SD}$	Drain to Source Diode Forward Voltage	V$_{GS}$ = 0V, I$_S$ = -4.1A	-	-	-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
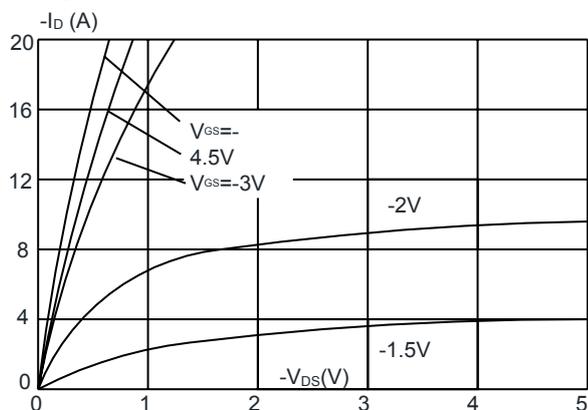
Figure 2: Typical Transfer Characteristics
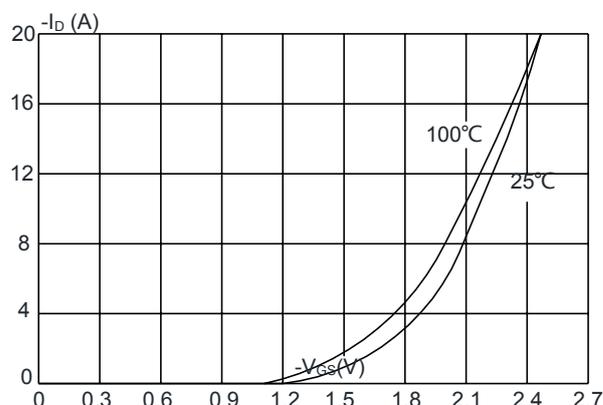
Figure 3: On-resistance vs. Drain Current
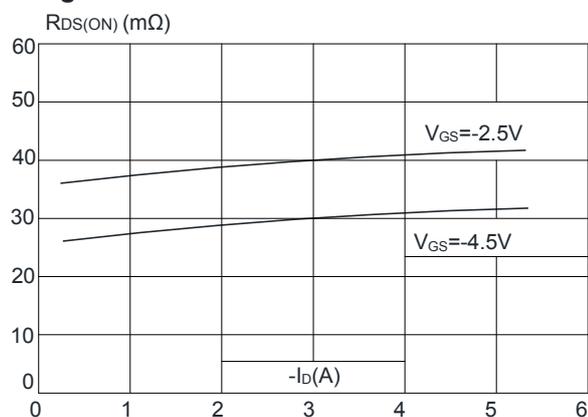
Figure 4: Body Diode Characteristics
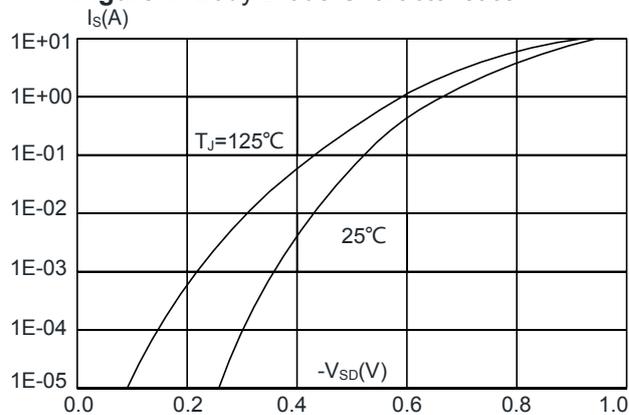
Figure 5: Gate Charge Characteristics
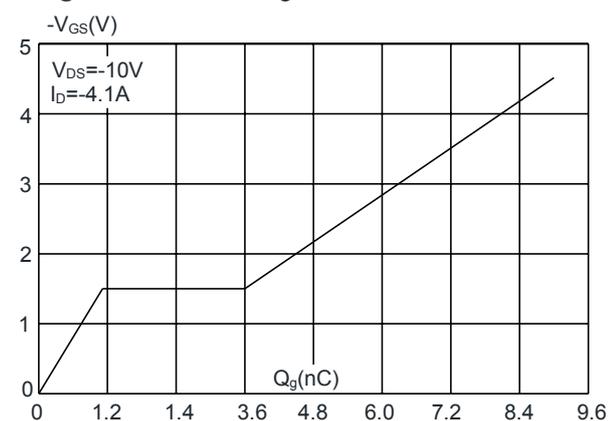

Figure 6: Capacitance Characteristics
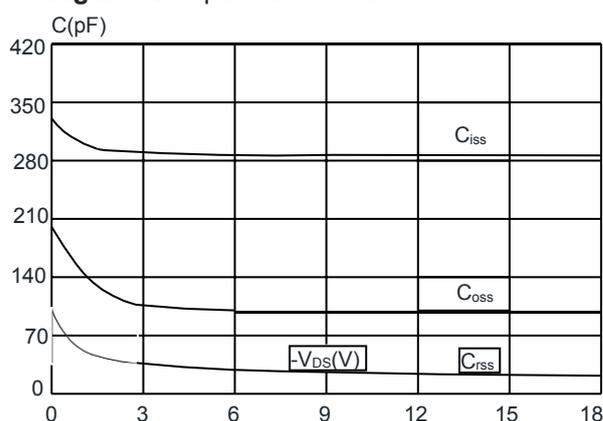
Figure 7: Normalized Breakdown Voltage vs. Junction Temperature
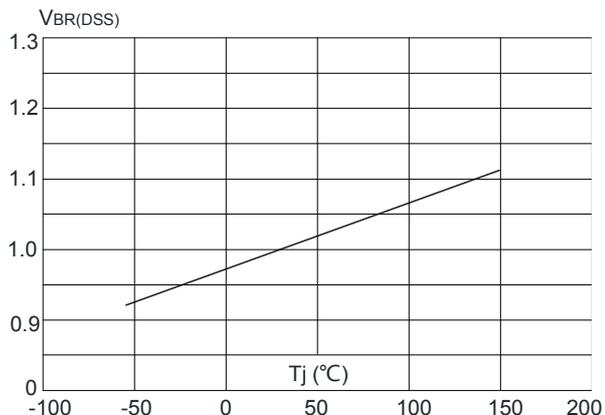

Figure 8: Normalized on Resistance vs. Junction Temperature
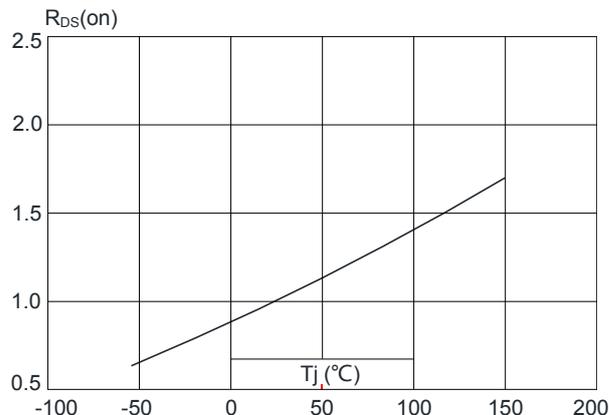

**Figure 9:** Maximum Safe Operating Area
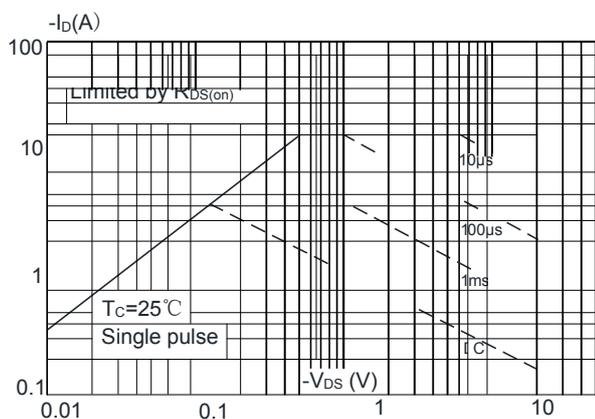
Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature
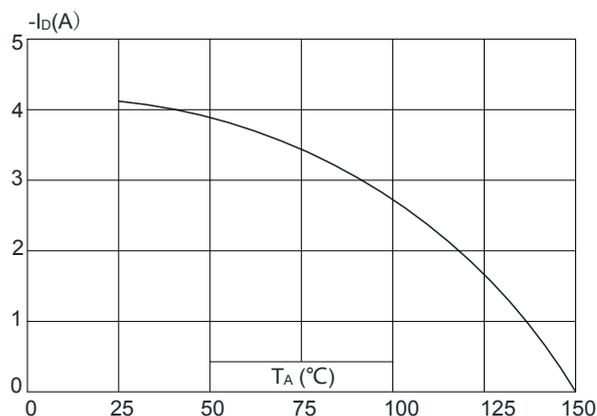
Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient
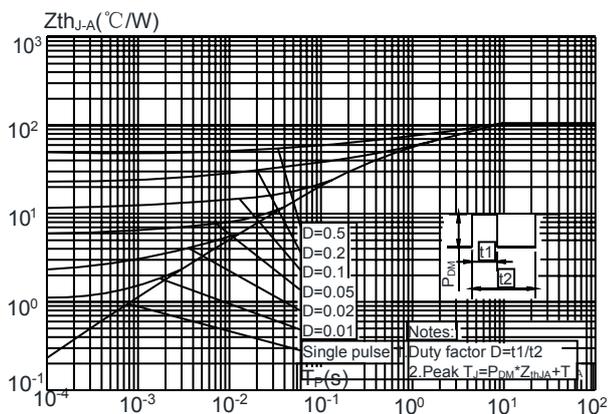
SOT-23 Mechanical Data
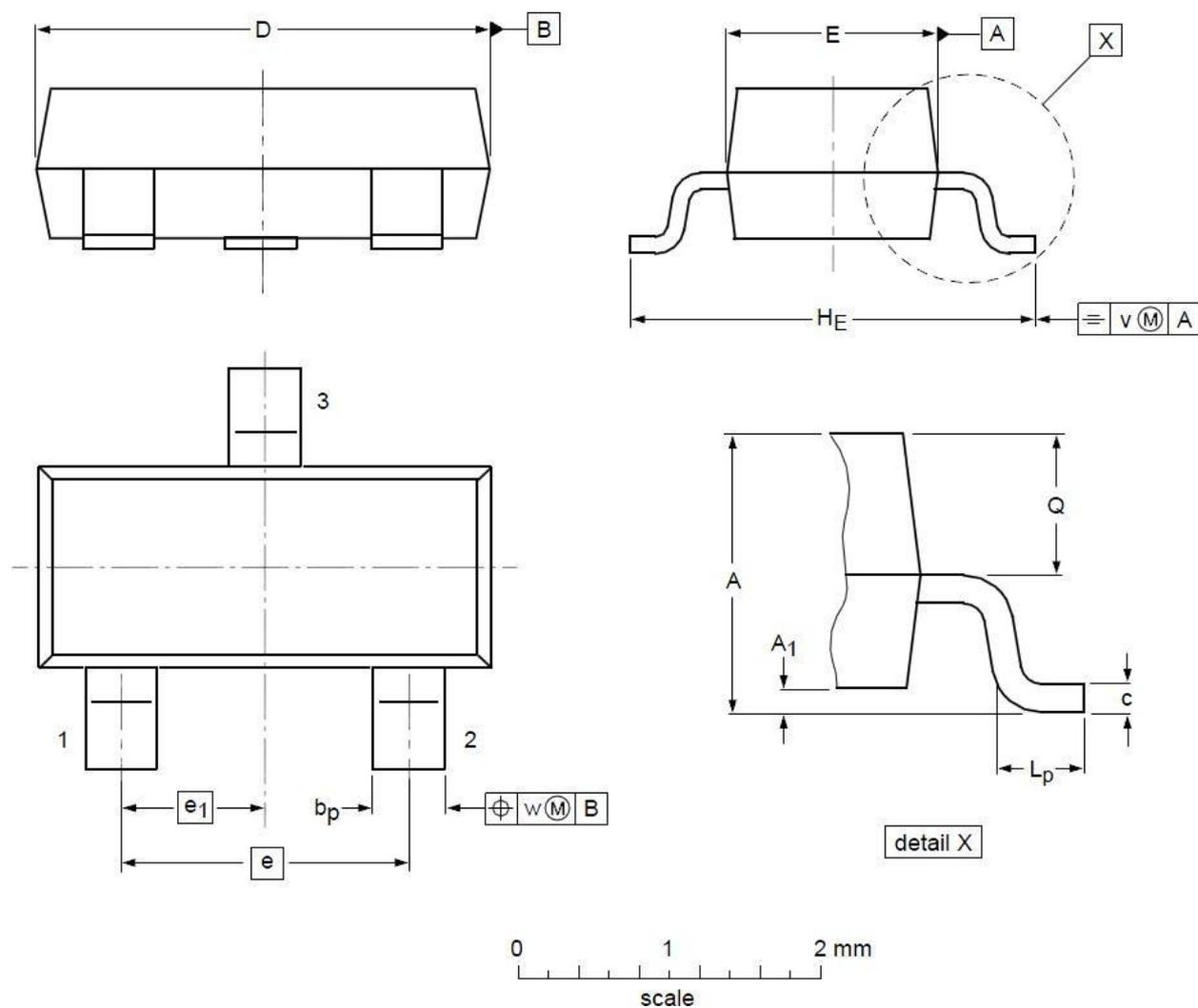
DIMENSIONS (unit : mm)

Symbol	Min	Typ	Max	Symbol	Min	Typ	Max
A	0.90	1.01	1.15	A_1	0.01	0.05	0.10
b_p	0.30	0.42	0.50	c	0.08	0.13	0.15
D	2.80	2.92	3.00	E	1.20	1.33	1.40
e	--	1.90	--	e_1	--	0.95	--
H_E	2.25	2.40	2.55	L_p	0.30	0.42	0.50
Q	0.45	0.49	0.55	v	--	0.20	--
w	--	0.10	--				