BPSEMI

BP2301

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV_{DSS}	-20V
$R_{DS(ON)}$	65mΩ
I_D	-4.2A

Description

The BP2301 provides the designer with the best combination of fast switching, low on-resistance and cost effectiveness.
The BP2301 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.
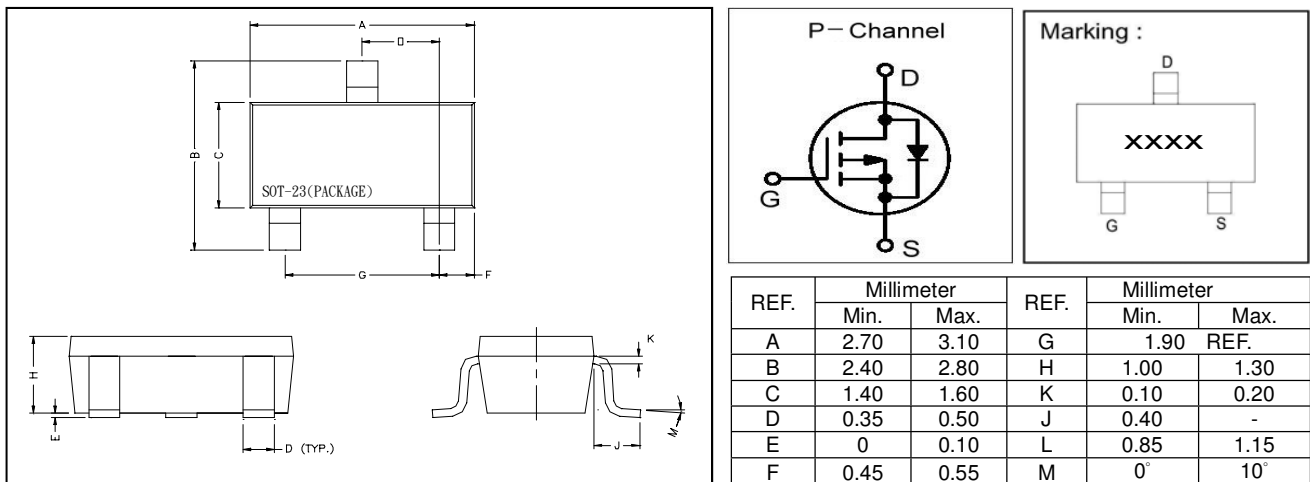
Features

• Super High Dense Cell Design for Extremely Low $R_{DS(ON)}$
• Reliable and Rugged

Applications

• Power Management in Notebook Computer
• Portable Equipment
• Battery Powered System.

Package Dimensions

SOT-23(PACKAGE)

P-Channel

Marking :

XXXX

REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Continuous Drain Current[3]	I_D @T$_A$=25℃	-4.2	A
Continuous Drain Current[3]	I_D @T$_A$=70℃	-3.4	A
Pulsed Drain Current[1,2]	I_{DM}	-10	A
Power Dissipation	P_D @T$_A$=25℃	1.38	W
Linear Derating Factor		0.01	W/℃
Operating Junction and Storage Temperature Range	Tj, Tstg	-55 ~ +150	℃

Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient[3] Max.	Rthj-a	90	℃/W

Electrical Characteristics(Tj = 25℃ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	-20	-	-	V	$V_{GS}=0$, $I_D=-250uA$
Breakdown Voltage Temperature Coefficient	$\triangle BV_{DSS}/\triangle Tj$	-	-0.1	-	V/℃	Reference to 25℃ , $I_D=-1mA$
Gate Threshold Voltage	$V_{GS(th)}$	-0.5	-	-	V	$V_{DS}=V_{GS}$, $I_D=-250uA$
Forward Transconductance	gfs	-	9	-	S	$V_{DS}=-5.0V$, $I_D=-2.8A$
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	$V_{GS}=\pm12V$
Drain-Source Leakage Current(Tj=25℃）	I_{DSS}	-	-	-1	uA	$V_{DS}=-20V$, $V_{GS}=0$
Drain-Source Leakage Current(Tj=70℃）		-	-	-10	uA	$V_{DS}=-16V$, $V_{GS}=0$
Static Drain-Source On-Resistance[2]	$R_{DS(ON)}$	-	-	53	mΩ	$I_D=-4.5A$, $V_{GS}=-10V$
		-	-	65		$I_D=-4.2A$, $V_{GS}=-4.5V$
		-	-	100		$I_D=-2.0A$, $V_{GS}=-2.5V$
		-	-	250		$I_D=-1.0A$, $V_{GS}=-1.8V$
Total Gate Charge[2]	Q_g	-	10.6	-	nC	$I_D=-4.2A$
Gate-Source Charge	Q_{gs}	-	2.32	-		$V_{DS}=-16V$
Gate-Drain ("Miller") Change	Q_{gd}	-	3.68	-		$V_{GS}=-4.5V$
Turn-on Delay Time[2]	$T_{d(on)}$	-	5.9	-	ns	$V_{DS}=-15V$ $I_D=-4.2A$, $V_{GS}=-10V$ $R_G=6\Omega$ $R_D=3.6\Omega$
Rise Time	T_r	-	3.6	-		
Turn-off Delay Time	$T_{d(off)}$	-	32.4	-		
Fall Time	T_f	-	2.6	-		
Input Capacitance	C_{iss}	-	740	-	pF	$V_{GS}=0V$ $V_{DS}=-15V$ f=1.0MHz
Output Capacitance	C_{oss}	-	167	-		
Reverse Transfer Capacitance	C_{rss}	-	126	-		

Source-Drain Diode

Forward On Voltage[2]	V_{SD}	-	-	-1.2	V	$I_S=-1.2A$, $V_{GS}=0$ Tj=25℃
Reverse Recovery Time	T_{rr}	-	27.7	-	ns	$I_S=-4.2A$,$V_{GS}=0$ dI/dt=100A/μs
Reverse Recovery Charge	Q_{rr}	-	22	-	nC	

Notes: 1. Pulse width limited by Max. junction temperature.
2. Pulse width≦300us, duty cycle≦2%.
3. Surface mounted on 1 in[2] copper pad of FR4 board;270℃/w when mounted on min. copper pad.
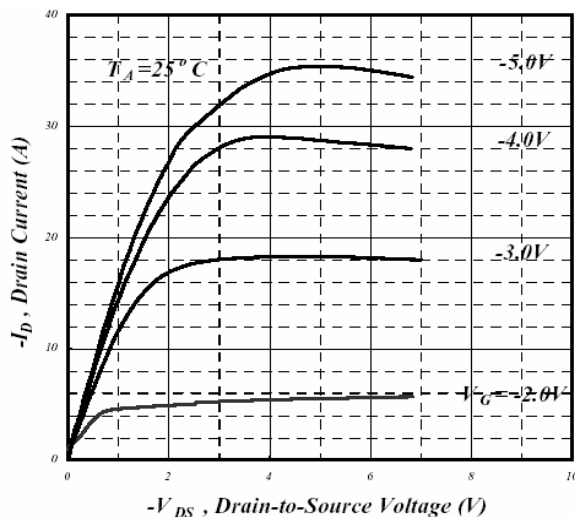
Characteristics Curve

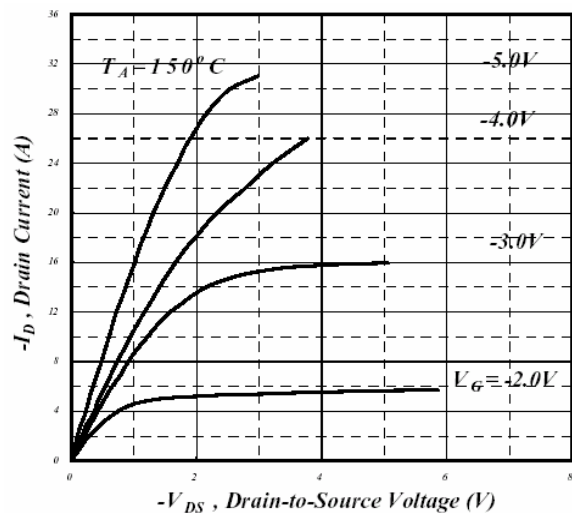

Fig 1. Typical Output Characteristics
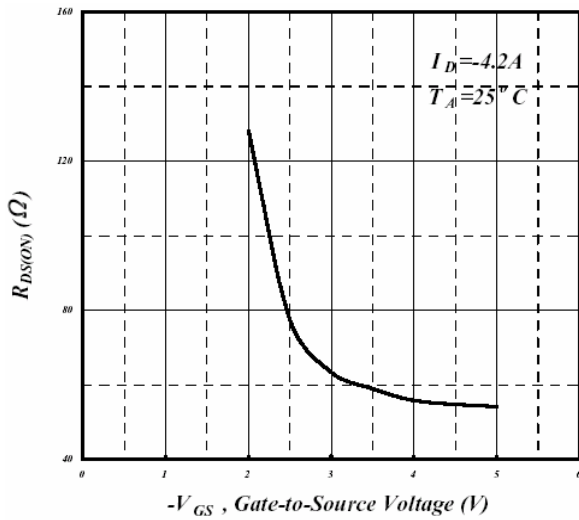
Fig 2. Typical Output Characteristics

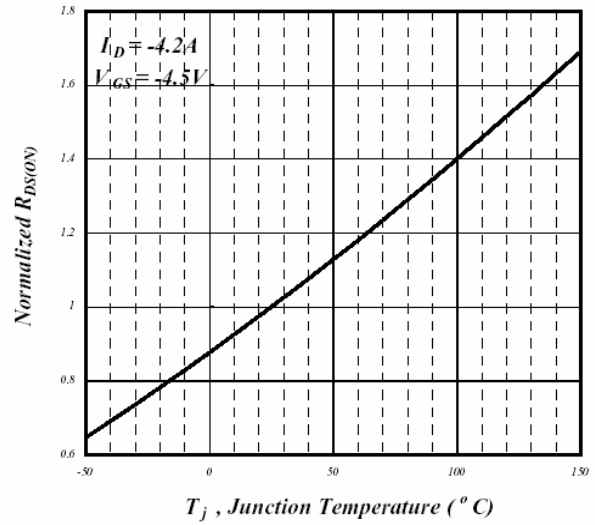Fig 3. On-Resistance v.s. Gate Voltage

Fig 4. Normalized On-Resistance
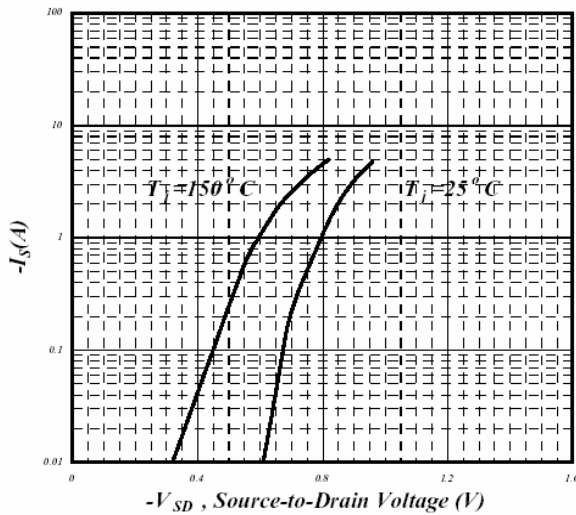v.s. Junction Temperature

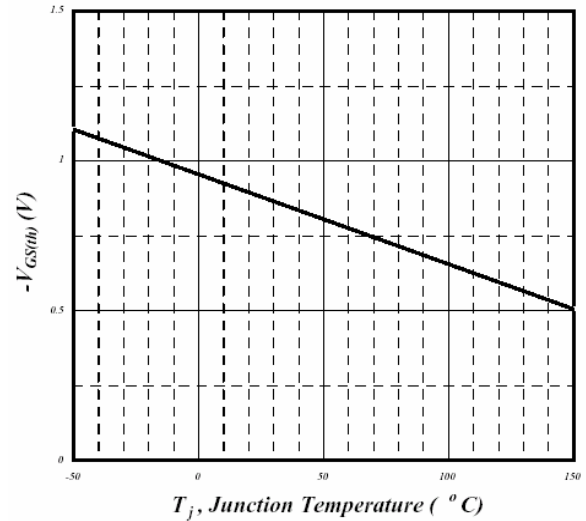Fig 5. Forward Characteristic of
Reverse Diode

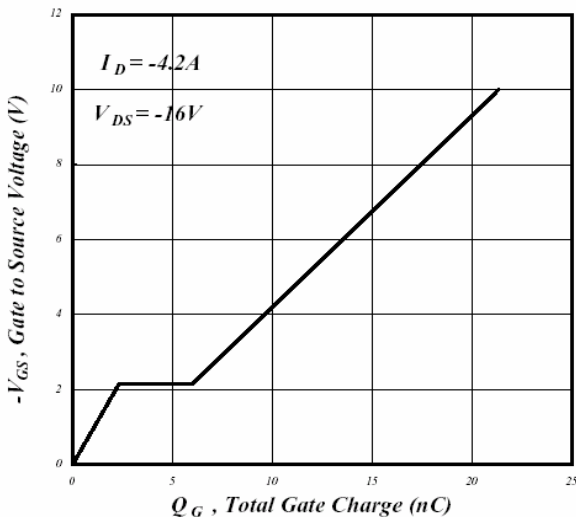Fig 6. Gate Threshold Voltage v.s.
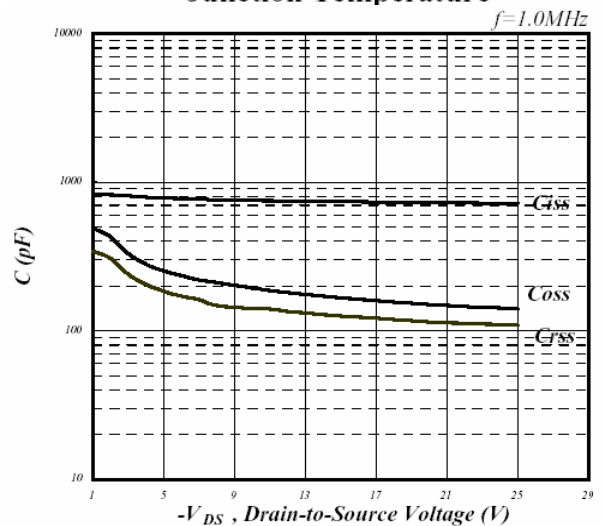Junction Temperature

Fig 7. Gate Charge Characteristics

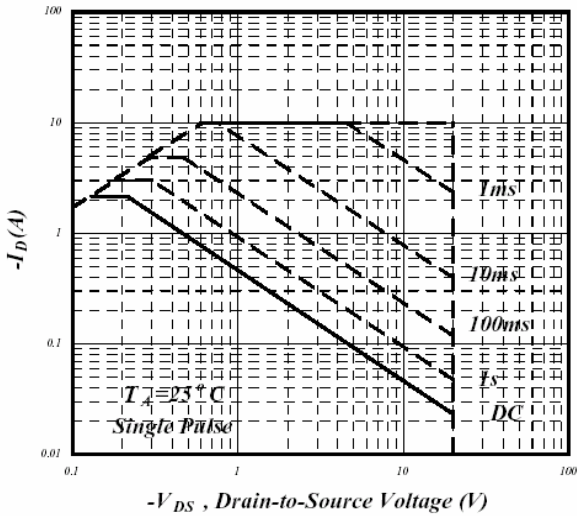Fig 8. Typical Capacitance Characteristics
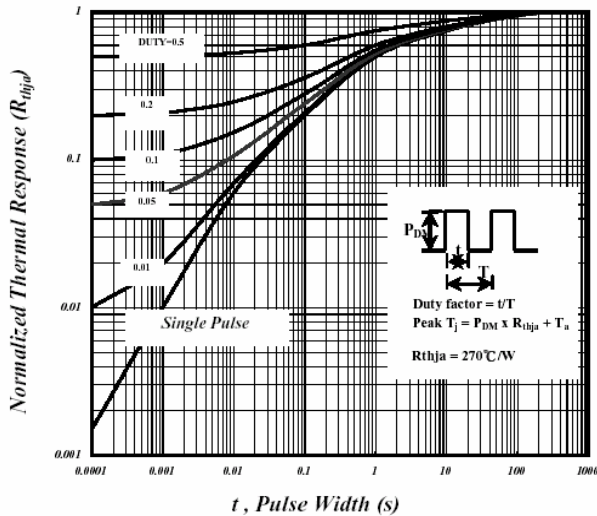
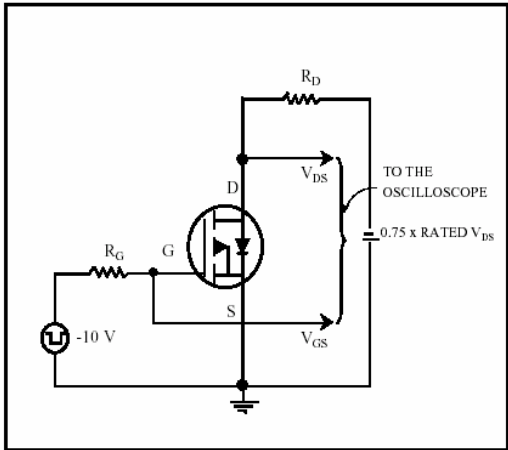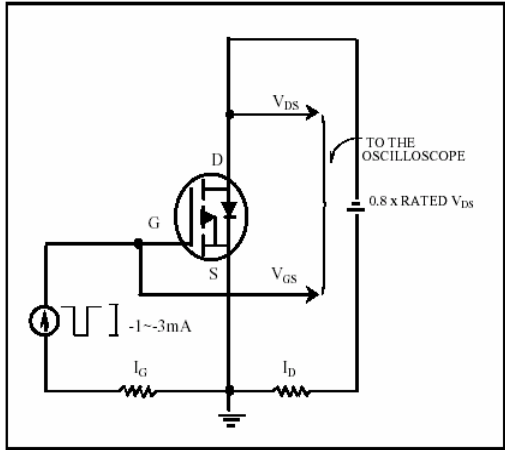Fig 9. Maximum Safe Operating Area

Fig 10. Effective Transient Thermal Impedance

Fig 11. Switching Time Circuit

Fig 12. Gate Charge Circuit