

P-Channel Enhancement Mode Field Effect Transistor

BV_{DSS}	-30V
$R_{DS(ON)}$	45m Ω
I_D	-5.6A

Description

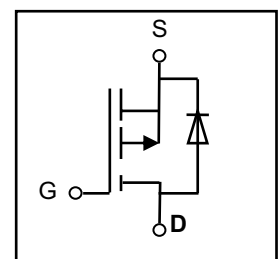
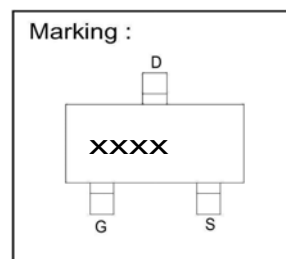
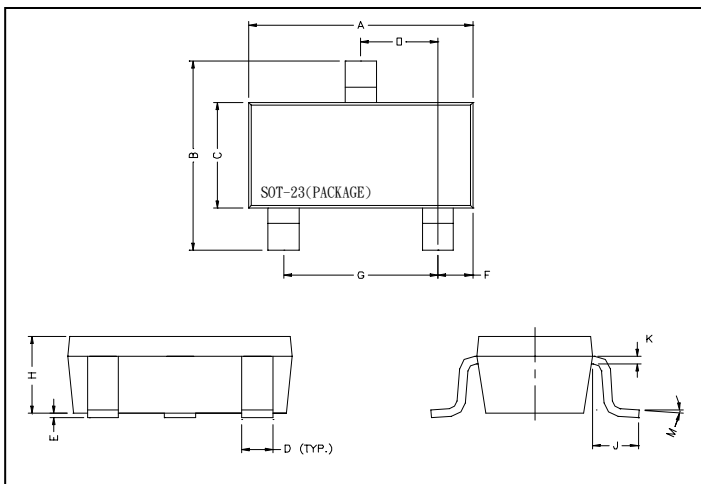
The BP4501 provides the designer with the best combination of fast switching, low on-resistance and cost effectiveness.

The BP4501 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
- * Simple drive requirement

Package Dimensions



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 ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter Sym	bol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous ^a @ $T_j=125^\circ\text{C}$ - Pulse d^b	I_D	-5.6	A
	I_{DM}	-25	A
Drain-source Diode Forward Current ^a	I_S	-1.5	A
Maximum Power Dissipation ^a	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_j, T_{STG}	-55 to 150	$^\circ\text{C}$

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to Ambient ^a	R_{th}	J_A	90	$^\circ\text{C}/\text{W}$
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ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

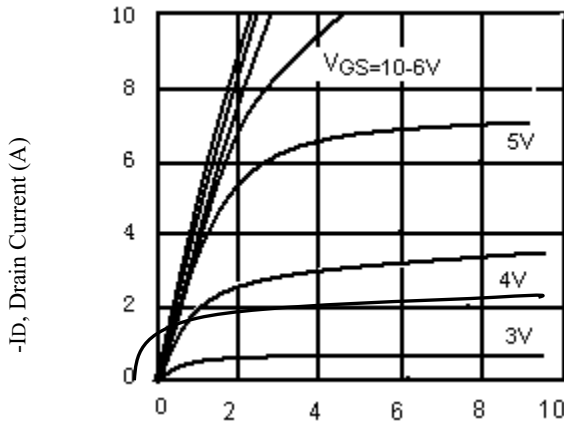
Parameter Sym	bol	Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =-250μA		-30		V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-30V, V _{GS} =0V			1	μA
Gate-Body Leakage	I _{GSS}	V _{GS} =±10V, V _{DS} =0V			±100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)} V	D _S =V _{GS} , I _D =-250μA	-1.2		-2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-4.6A		45	50	mΩ
		V _{GS} =-4.5V, I _D =-3.0A		65	70	
Forward Transconductance	g _{FS}	V _{GS} =-10V, I _D =-1.7A		17		S
DAYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =-15V, V _{GS} =0V f=1.0MHz		1226		pF
Output Capacitance	C _{OSS}			187		pF
Reverse Transfer Capacitance	C _{RSS}			91		pF
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	t _{D(ON)}	V _{DD} =-15V I _D =-1.0A, V _{GEN} =-10V R _L =15ohm R _{GEN} =6ohm		5.9		ns
Rise Time	t _r			6.9		ns
Turn-Off Delay Time	t _{D(OFF)}			48		ns
Fall Time	t _f			16		ns
Total Gate Charge	Q _g	V _{DS} =-15V, I _D =-1.7A V _{GS} =-10V		9.8		nC
Gate-Source Charge	Q _{gs}			1.8		nC
Gate-Drain Charge	Q _{gd}			4.5		nC

ELECTRICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

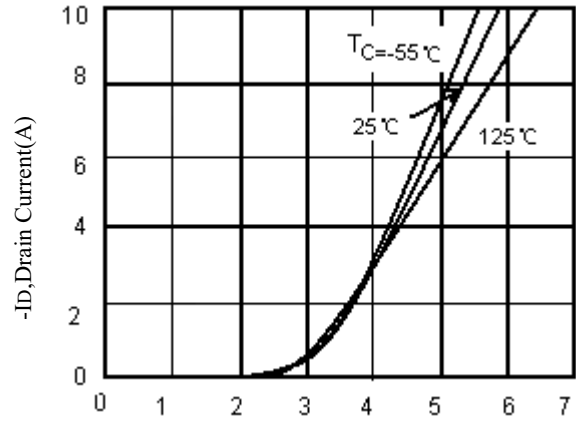
Parameter Sym	bol	Condition	Min	Typ	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode Forward Voltage	VSD	VGS=0V,Is=-1.25A		-0.8	-1.2	V

Notes

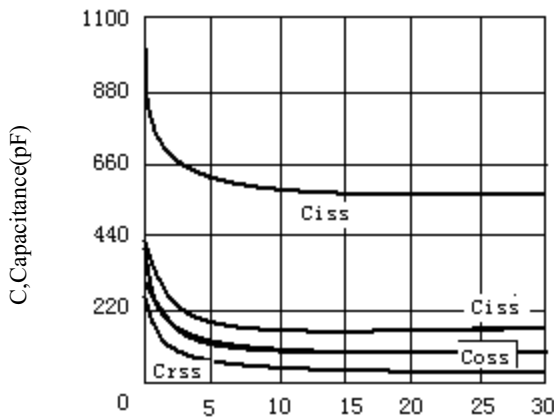
- a. Surface Mounted on FR4 Board, $t \leq 10\text{sec}$
- b. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
- c. Guaranteed by design, not subject to production testing.



- VDS, Drain-to-Source Voltage (V)
Figure 1. Output Characteristics



-VGS, Gate-to-source Voltage (V)
Figure 2. Transfer Characteristics



- VGS, Drain-to Source Voltage
Figure3. Capacitance

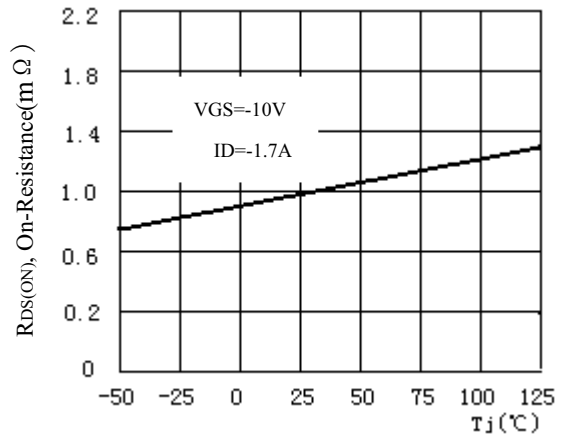


Figure4. On-Resistance Variation with Temperature

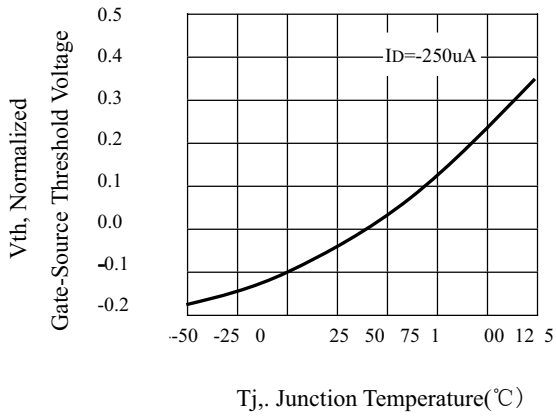
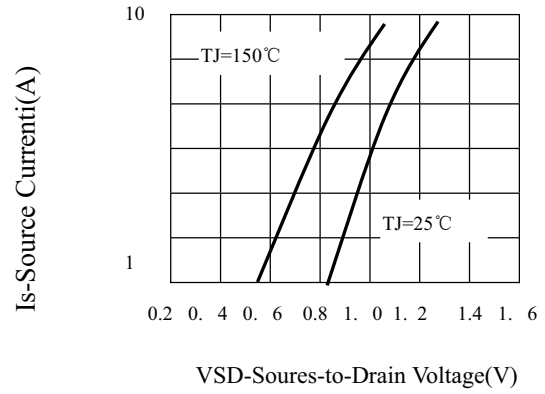


Figure 5. Gate Threshold Variation With Temperature



VSD-Source-to-Drain Voltage (V)

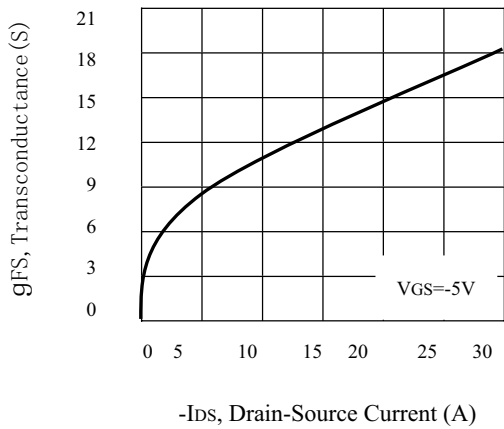


Figure 7. Transconductance Variation With Drain Current

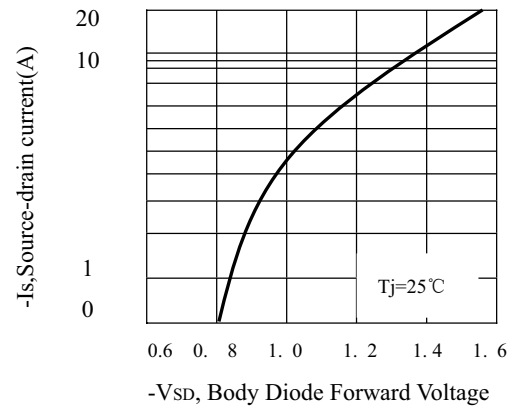


Figure 8. Body Diode Forward Voltage Variation with Source Current

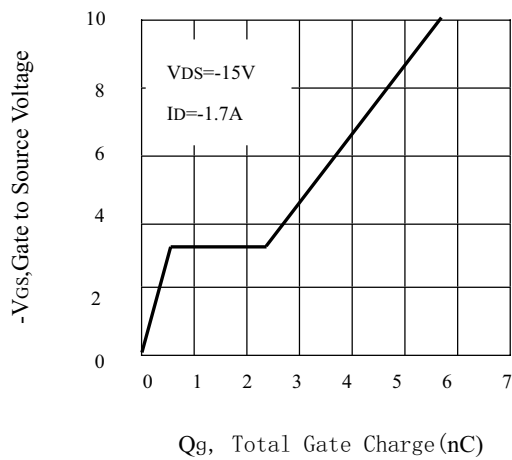


Figure 9. Gate Charge

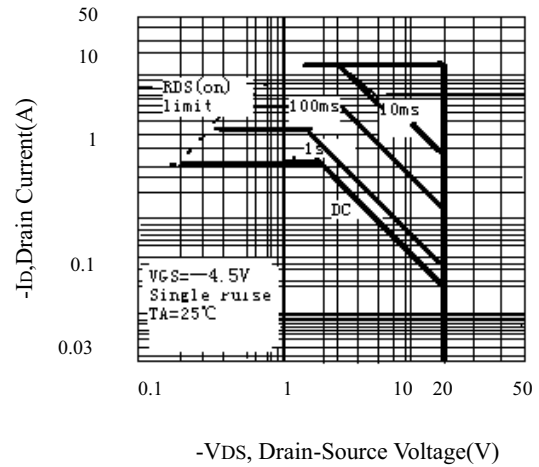


Figure 10. Maximum Safe Operating Area