

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV <sub>DSS</sub>	30V
R <sub>DS(ON)</sub>	28mΩ
I <sub>D</sub>	5.8A

### Description

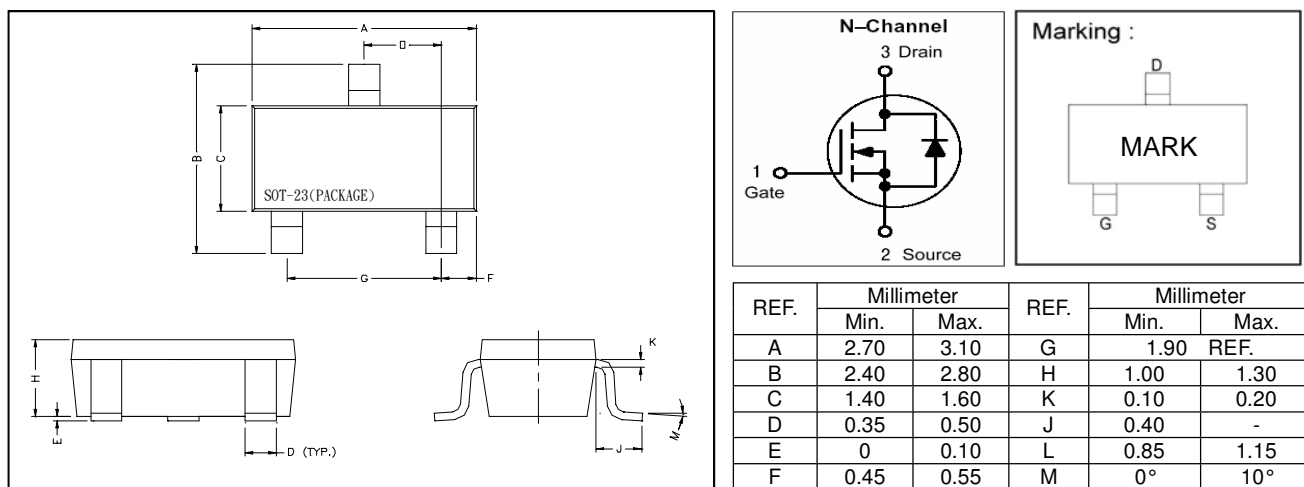
The BP4500 uses advanced trench technology to provide excellent on-resistance extremely efficient and cost-effectiveness device.

The BP4500 is universally used for all commercial-industrial applications.

### Features

- \* Lower Gate Charge
- \* Small Package Outline
- \* RoHS Compliant

### Package Dimensions



### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	30	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=25°C	5.8	A
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=70°C	4.9	A
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	30	A
Total Power Dissipation	P <sub>D</sub> @TA=25°C	1.38	W
Linear Derating Factor		0.01	W/°C
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55 ~ +150	°C

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	R <sub>thj-a</sub>	90	°C/W

## Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	30	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.7	-	1.4	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
Forward Transconductance	g <sub>fs</sub>	-	15	-	S	V <sub>DS</sub> =5V, I <sub>D</sub> =5A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±12V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =24V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =55°C)		-	-	5	uA	V <sub>DS</sub> =24V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	-	28	m	V <sub>GS</sub> =10V, I <sub>D</sub> =5.8A
		-	-	33		V <sub>GS</sub> =4.5V, I <sub>D</sub> =5.0A
		-	-	52		V <sub>GS</sub> =2.5V, I <sub>D</sub> =4.0A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	9.7	12	nC	I <sub>D</sub> =5.8A V <sub>DS</sub> =15V V <sub>GS</sub> =4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	1.6	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	3.1	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	3.3	-	ns	V <sub>DS</sub> =15V V <sub>GS</sub> =10V R <sub>G</sub> =3 R <sub>L</sub> =2.7
Rise Time	T <sub>r</sub>	-	4.8	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	26.3	-		
Fall Time	T <sub>f</sub>	-	4.1	-		
Input Capacitance	C <sub>iss</sub>	-	823	1030	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =15V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	99	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	77	-		
Gate Resistance	R <sub>g</sub>	-	1.2	3.6		f=1.0MHz

## Source-Drain Diode

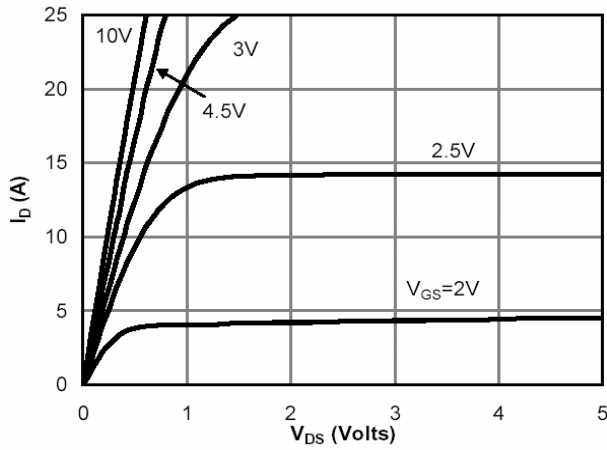
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.0	V	I <sub>S</sub> =1.0A, V <sub>GS</sub> =0V
Reverse Recovery Time <sup>2</sup>	T <sub>rr</sub>	-	16	-	ns	I <sub>S</sub> =5A, V <sub>GS</sub> =0V di/dt=100A/μs
Reverse Recovery Charge	Q <sub>rr</sub>	-	8.9	-	nC	
Continuous Source Current (Body Diode)	I <sub>S</sub>	-	-	2.5	A	V <sub>D</sub> =V <sub>G</sub> =0V, V <sub>S</sub> =1.0V

Notes: 1. Pulse width limited by Max. junction temperature.

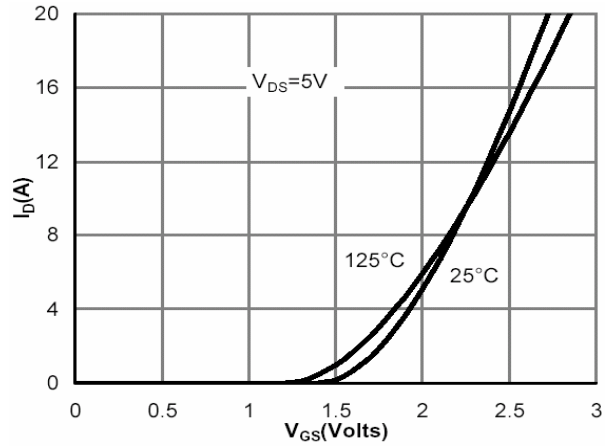
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270°C/W when mounted on Min. copper pad.

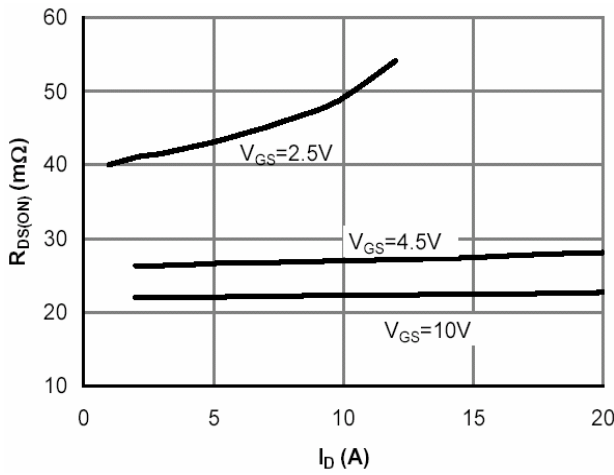
## Characteristics Curve



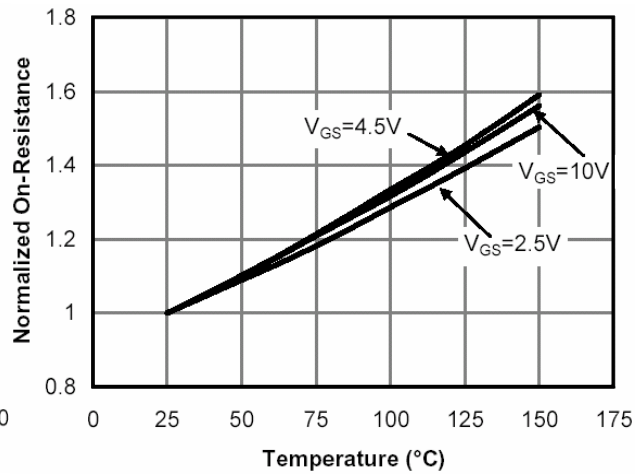
**Fig 1. Typical Output Characteristics**



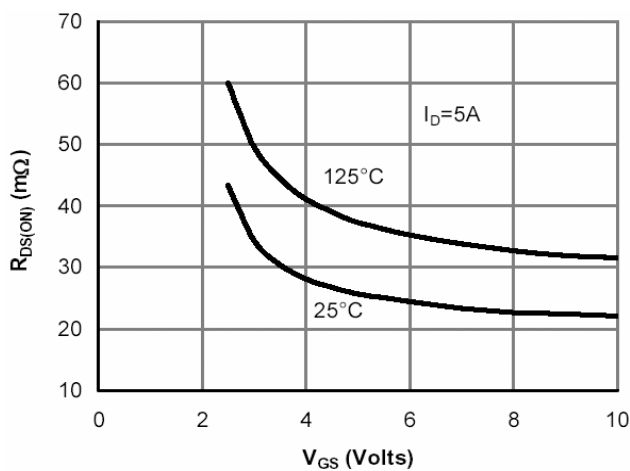
**Fig 2. Transfer Characteristics**



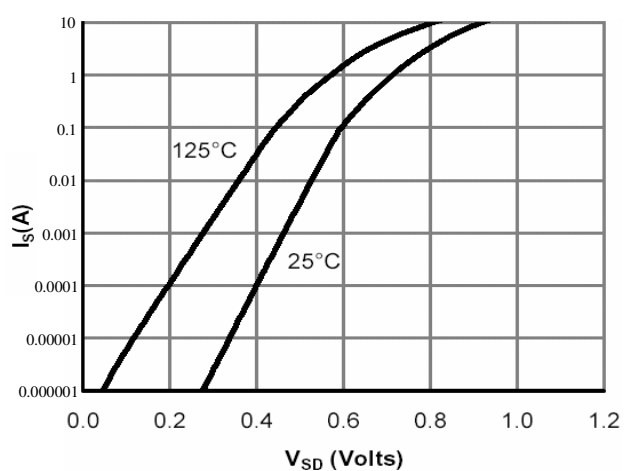
**Fig 3. On-Resistance v.s. Drain Current and Gate Voltage**



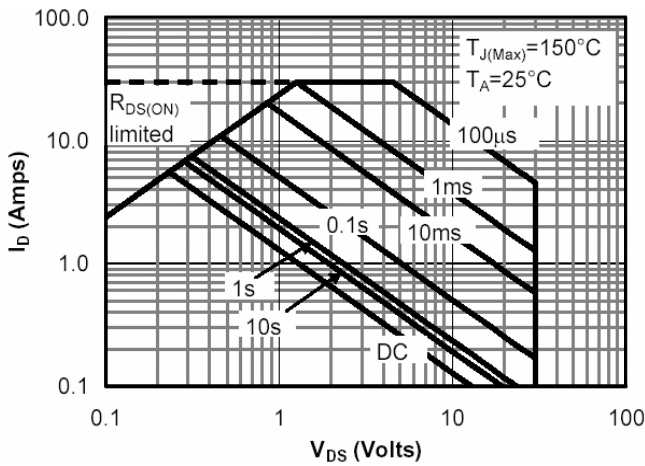
**Fig 4. On-Resistance v.s. Junction Temperature**



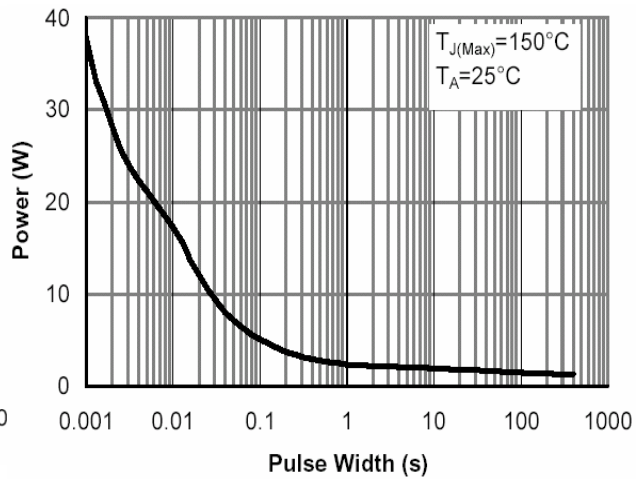
**Fig 5. On-Resistance v.s. Gate-Source Voltage**



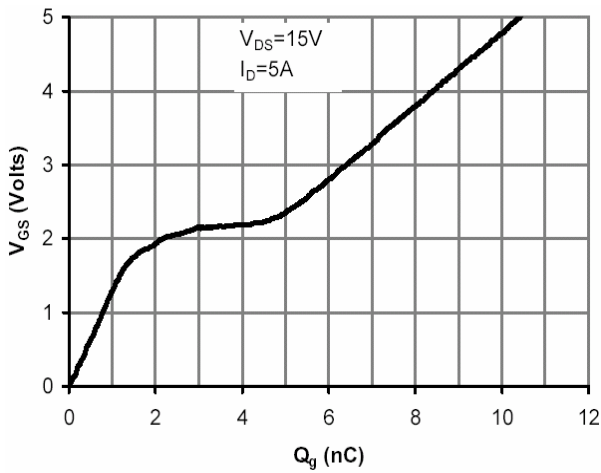
**Fig 6. Body Diode Characteristics**



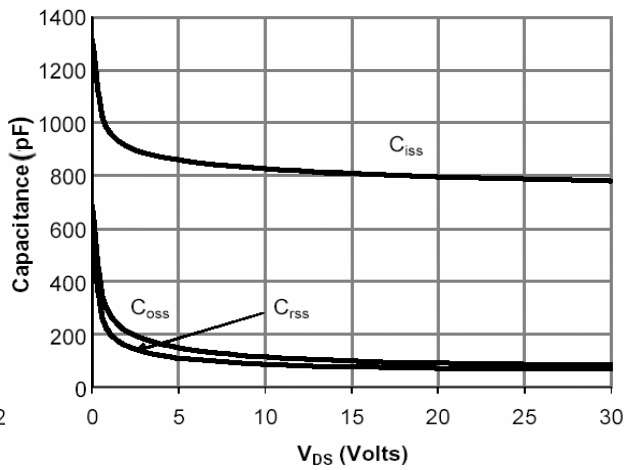
**Fig 7. Maximum Safe Operating Area**



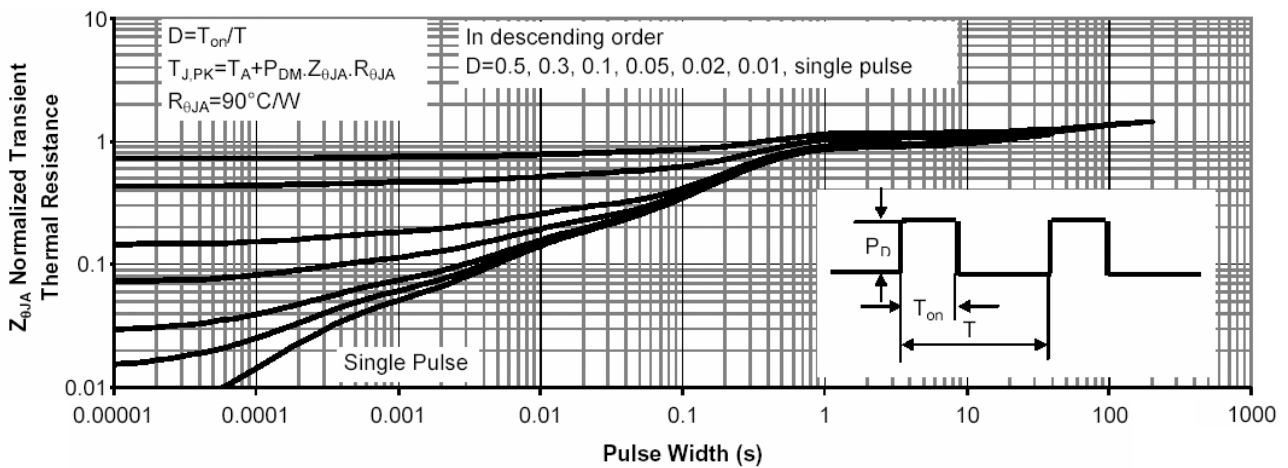
**Fig 8. Single Pulse Power Rating Junction-to-Ambient**



**Fig 9. Gate Charge Characteristics**



**Fig 10. Typical Capacitance Characteristics**



**Fig 11. Normalized Maximum Transient Thermal Impedance**