

**N-CHANNEL ENHANCEMENT MODE POWER MOSFET**

BV <sub>DSS</sub>	25V
R <sub>DS(ON)</sub>	40mΩ
I <sub>D</sub>	4A

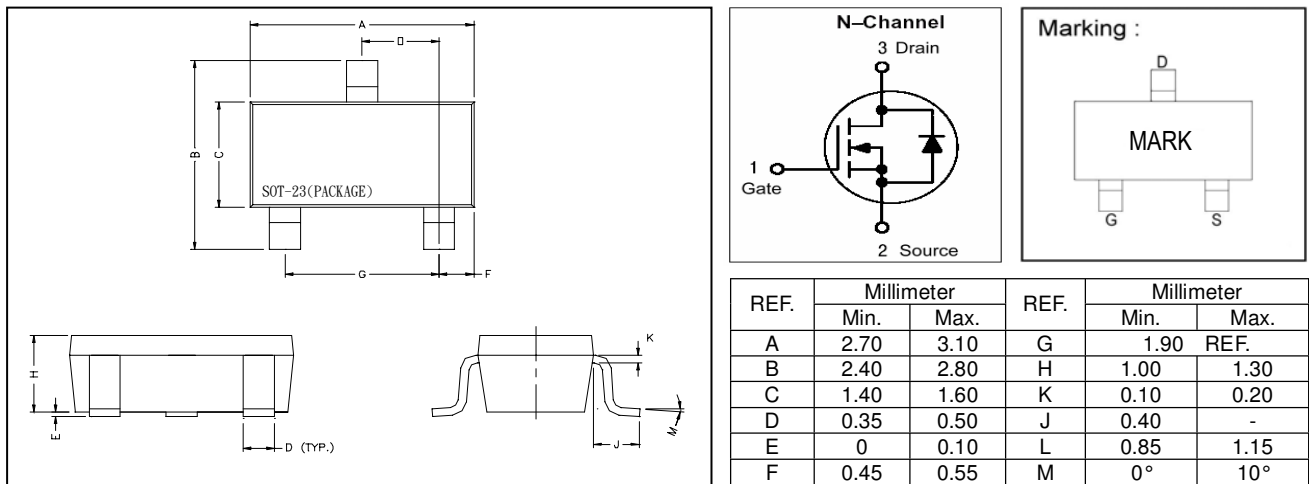
**Description**

The BP45EN provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness.

The BP45EN is universally used for all commercial-industrial surface mount applications.

**Features**

- \*Low on-resistance
- \*Capable of 2.5V gate drive
- \*Small Package Outline

**Package Dimensions**

**Absolute Maximum Ratings**

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	25	V
Gate-Source Voltage	V <sub>GS</sub>	±12	V
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=25°C	4	A
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @TA=70°C	3.6	A
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	20	A
Power Dissipation	P <sub>D</sub> @TA=25°C	1.25	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>	100	°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>	25	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Breakdown Voltage Temperature Coefficient	ΔBV <sub>DSS</sub> / ΔT <sub>j</sub>	-	0.1	-	V/°C	Reference to 25°C, I <sub>D</sub> =1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	1.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250uA
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> =25V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =70°C)		-	-	25	uA	V <sub>DS</sub> =16V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	40	m Ω	V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A
		-	-	65		V <sub>GS</sub> =2.5V, I <sub>D</sub> =3.2A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	10	-	nC	I <sub>D</sub> =4A V <sub>DS</sub> =10V V <sub>GS</sub> =4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	3.6	-		
Gate-Drain ("Miller") Change	Q <sub>gd</sub>	-	2	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	8	-	ns	V <sub>DD</sub> =10V I <sub>D</sub> =1A V <sub>GS</sub> =4.5V R <sub>G</sub> =0.2
Rise Time	T <sub>r</sub>	-	6	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	19	-		
Fall Time	T <sub>f</sub>	-	7	-		
Input Capacitance	C <sub>iss</sub>	-	550	-	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =15V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	120	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	80	-		

## Source-Drain Diode

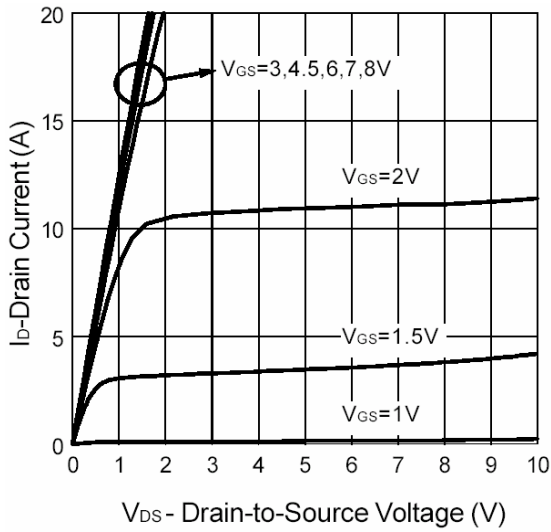
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	0.7	1.3	V	I <sub>S</sub> =1.25A, V <sub>GS</sub> =0V

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

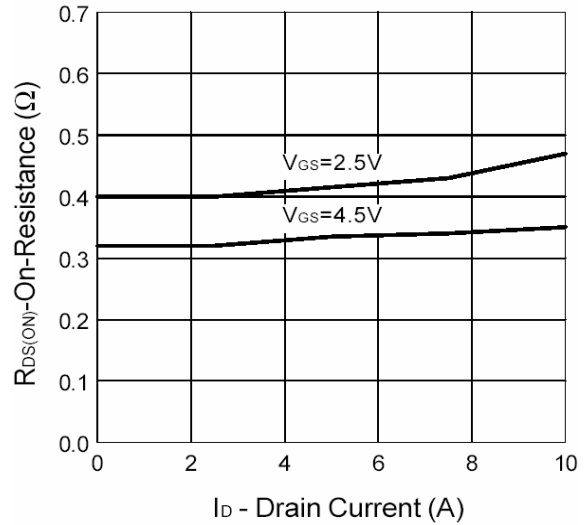
2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on FR4 board, t ≤ 10sec.

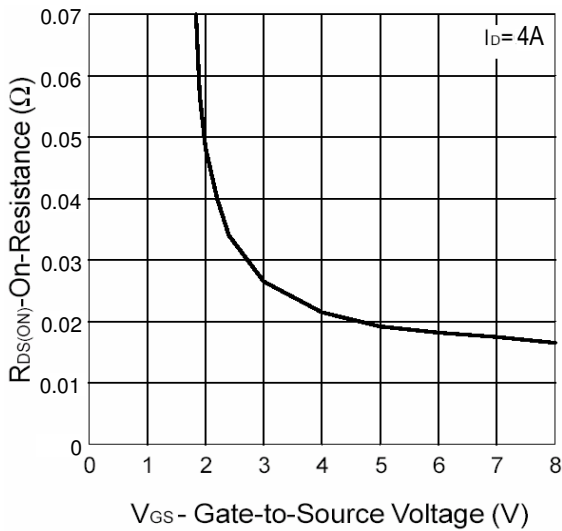
**Characteristics Curve**



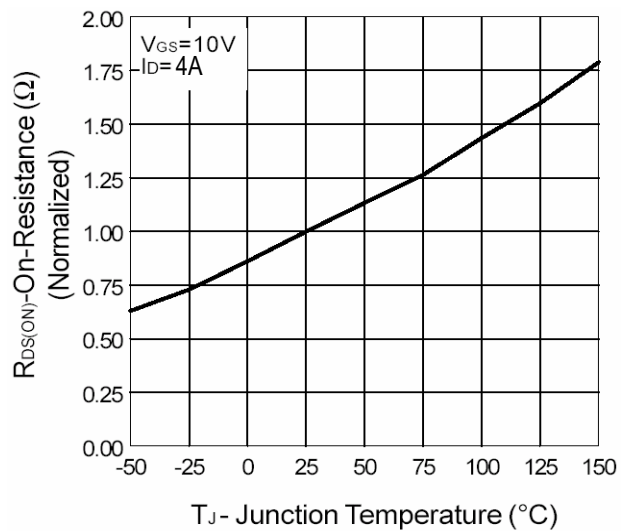
**Fig 1. Typical Output Characteristics**



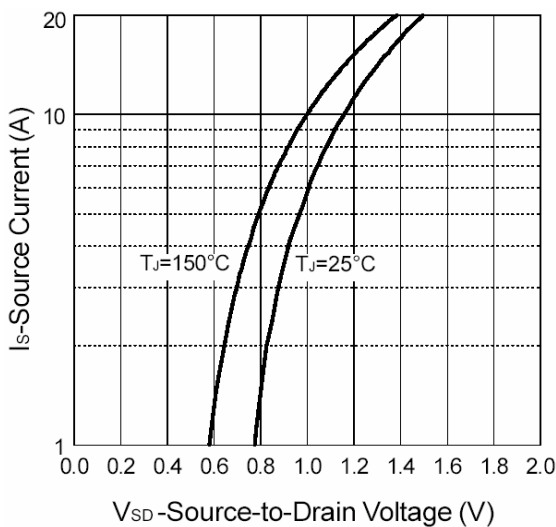
**Fig 2. On-Resistance v.s. Drain Current**



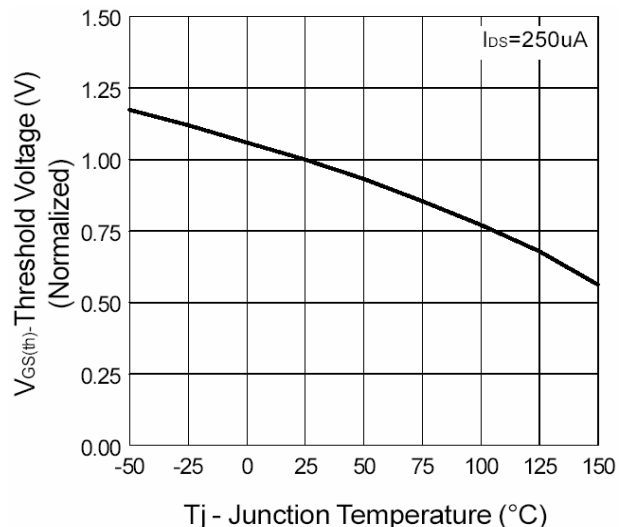
**Fig 3. On-Resistance v.s. Gate Voltage**



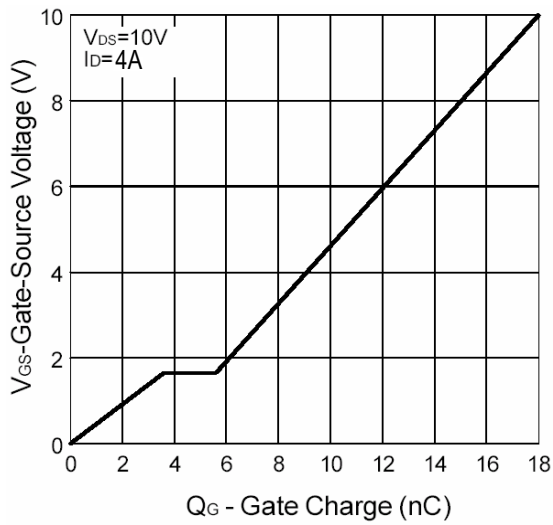
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



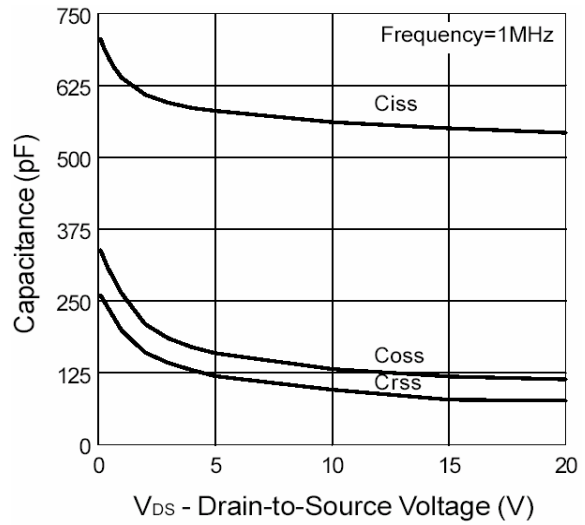
**Fig 5. Source-Drain Diode Forward Voltage**



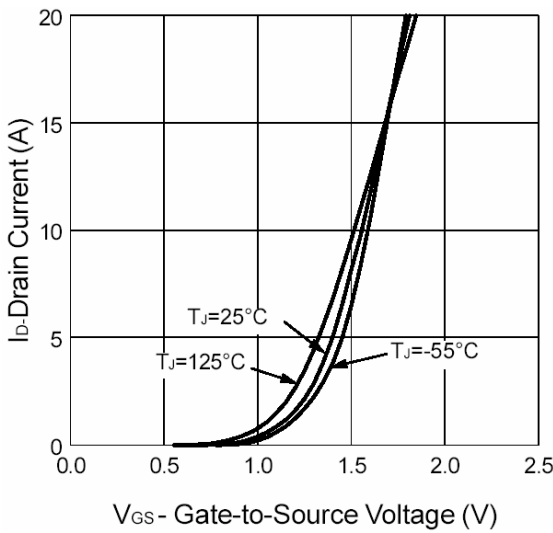
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



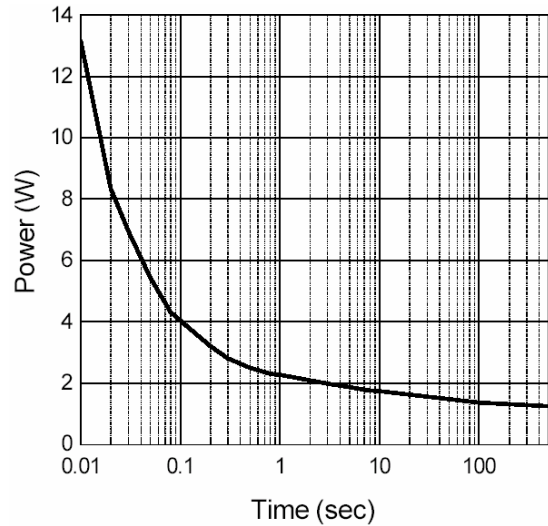
**Fig 7. Gate Charge Characteristics**



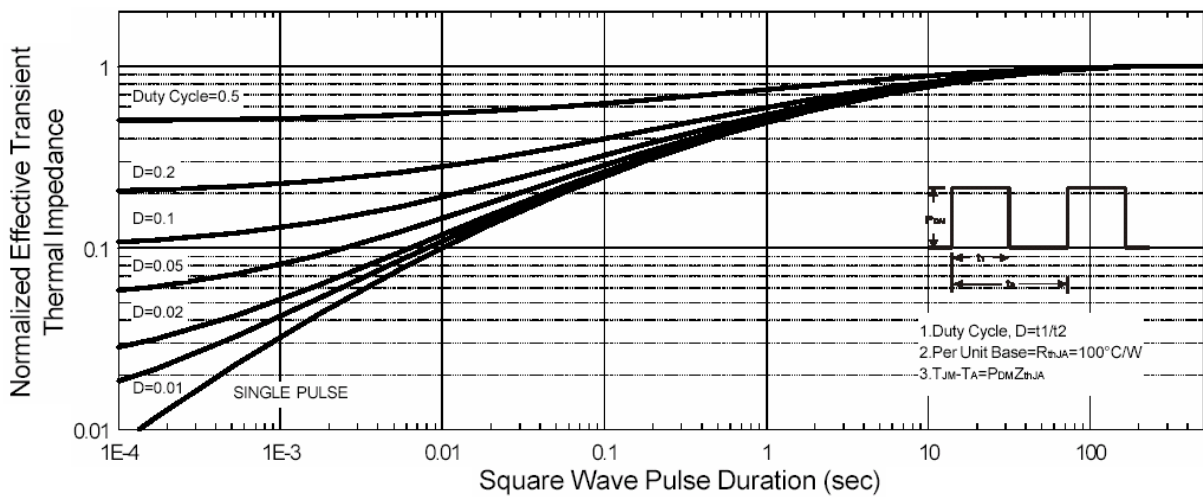
**Fig 8. Typical Capacitance Characteristics**



**Fig 9. Transfer Characteristics**



**Fig 10. Single Pulse Power**



**Fig 11. Normalized Thermal Transient Impedance, Junction to Ambient**