

$BV_{DSS}$	-30V
$R_{DS(ON)}$	20m $\Omega$
$I_D$	-27A

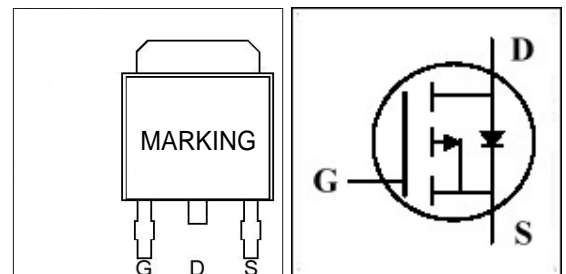
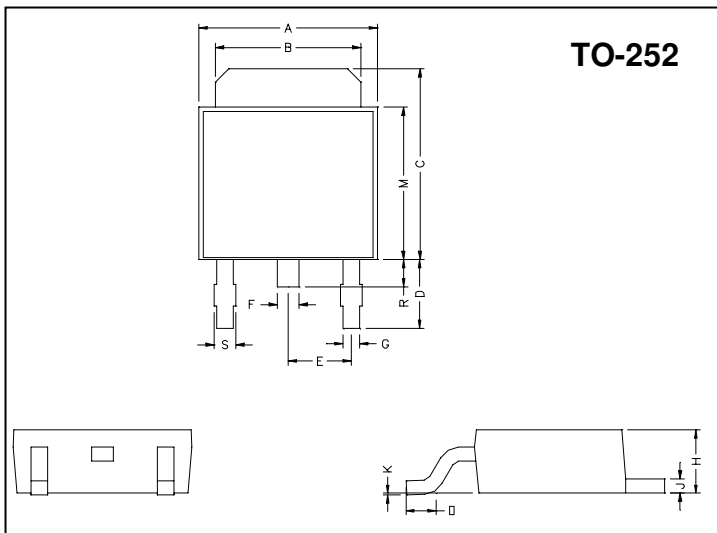
**P-CHANNEL ENHANCEMENT MODE POWER MOSFET**
**Description**

The BP50P3 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

The TO-252 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

**Features**

- \*Simple Drive Requirement
- \*Lower On-resistance
- \*Fast Switching Characteristic

**Package Dimensions**


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	0.50	0.70
B	5.20	5.50	H	2.20	2.40
C	6.80	7.20	J	0.45	0.55
D	2.40	3.00	K	0	0.15
E	2.30 REF.		L	0.90	1.50
F	0.70	0.90	M	5.40	5.80
S	0.60	0.90	R	0.80	1.20

**Absolute Maximum Ratings**

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^\circ C$	-47	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^\circ C$	-50	A
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	-300	A
Total Power Dissipation	$P_D @T_C=25^\circ C$	89	W
Linear Derating Factor		0.71	W/ $^\circ C$
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ +150	$^\circ C$

**Thermal Data**

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-case Max.	$R_{thj-case}$	1.4	$^\circ C/W$
Thermal Resistance Junction-ambient Max.	$R_{thj-amb}$	110	$^\circ C/W$

## 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
Breakdown Voltage Temperature Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	-0.03	-	V/°C	Reference to 25°C, I <sub>D</sub> =-1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	-	-3.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Forward Transconductance	g <sub>fs</sub>	-	34	-	S	V <sub>DS</sub> =-10V, I <sub>D</sub> =-24A
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±25V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> =150°C)		-	-	-25	uA	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	20	m	V <sub>GS</sub> =-10V, I <sub>D</sub> =-30A
		-	-	32		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-24A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	42	67	nC	I <sub>D</sub> =-16A V <sub>DS</sub> =-24V V <sub>GS</sub> =-4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	6	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	25	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	11	-	ns	V <sub>DS</sub> =-15V I <sub>D</sub> =-16A V <sub>GS</sub> =-10V R <sub>G</sub> =3.3 R <sub>D</sub> =0.94
Rise Time	T <sub>r</sub>	-	35	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	58	-		
Fall Time	T <sub>f</sub>	-	78	-		
Input Capacitance	C <sub>iss</sub>	-	2870	4590	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =-25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	960	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	740	-		

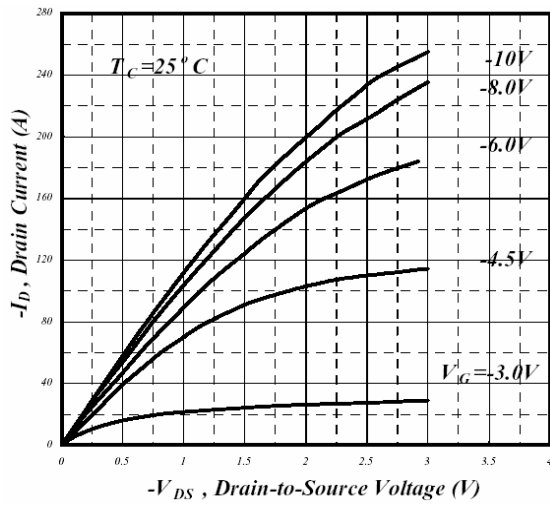
## Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	-1.2	V	I <sub>S</sub> =-24A, V <sub>GS</sub> =0V
Reverse Recovery Time <sup>2</sup>	T <sub>rr</sub>	-	47	-	ns	I <sub>S</sub> =-16A, V <sub>GS</sub> =0V
Reverse Recovery Charge	Q <sub>rr</sub>	-	43	-	nC	dI/dt=100A/μs

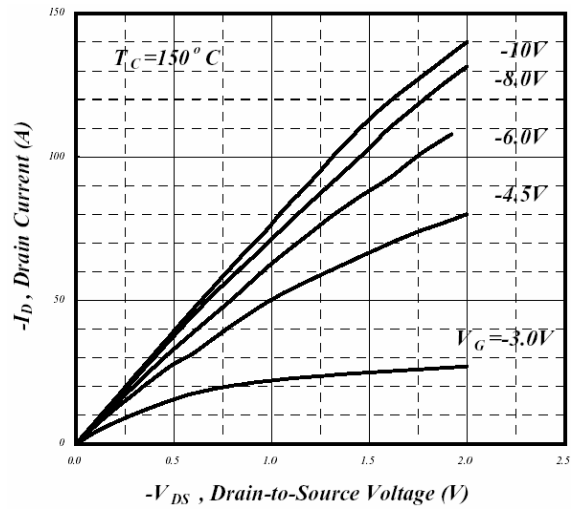
Notes: 1. Pulse width limited by safe operating area.

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

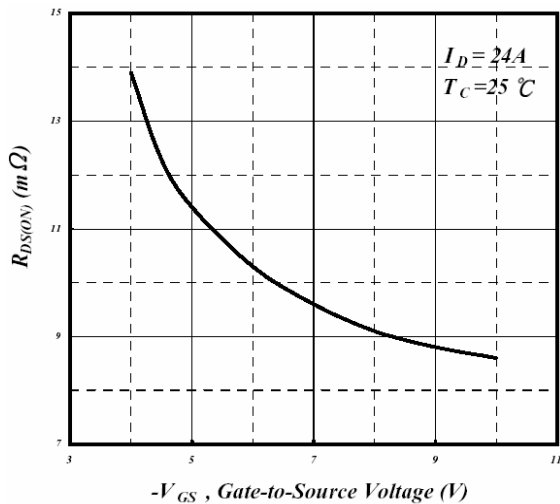
**Characteristics Curve**



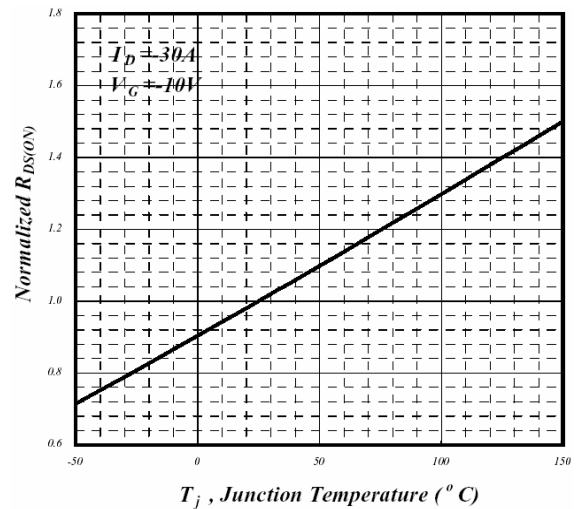
**Fig 1. Typical Output Characteristics**



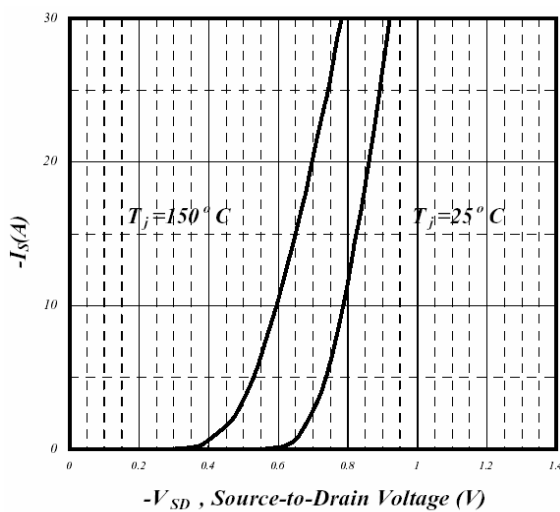
**Fig 2. Typical Output Characteristics**



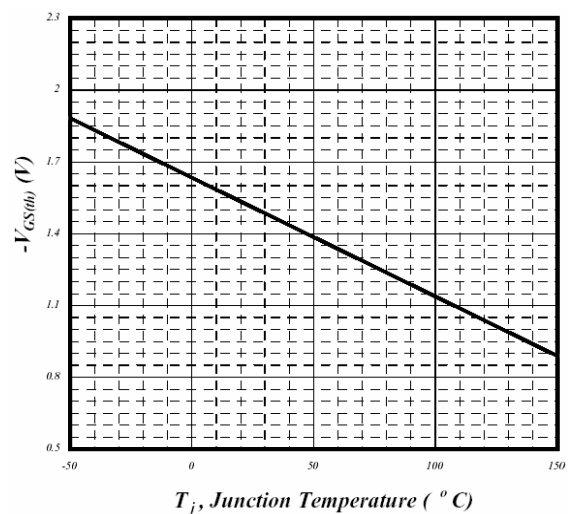
**Fig 3. On-Resistance v.s. Gate Voltage**



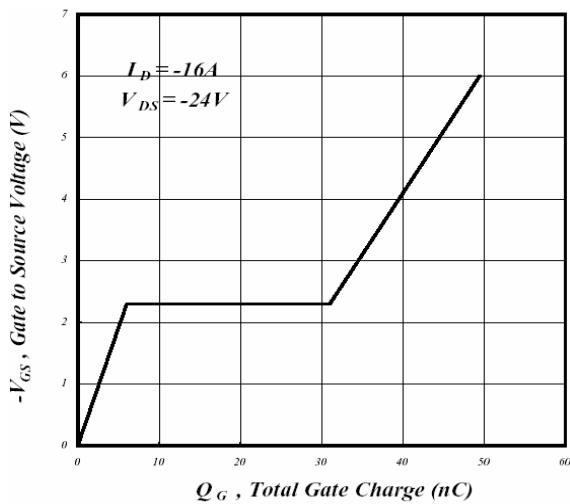
**Fig 4. Normalized On-Resistance v.s. Junction Temperature**



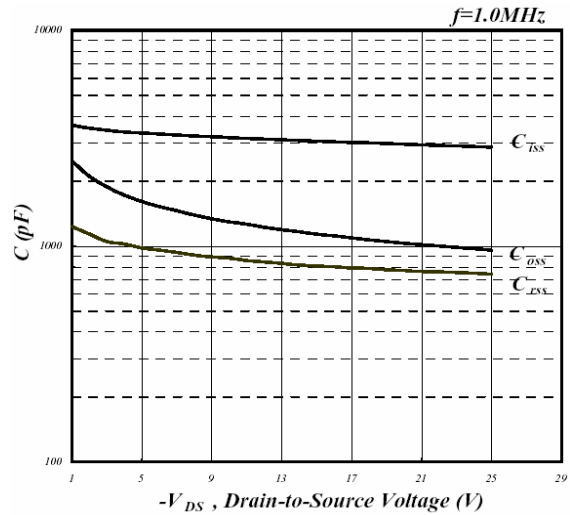
**Fig 5. Forward Characteristics of Reverse Diode**



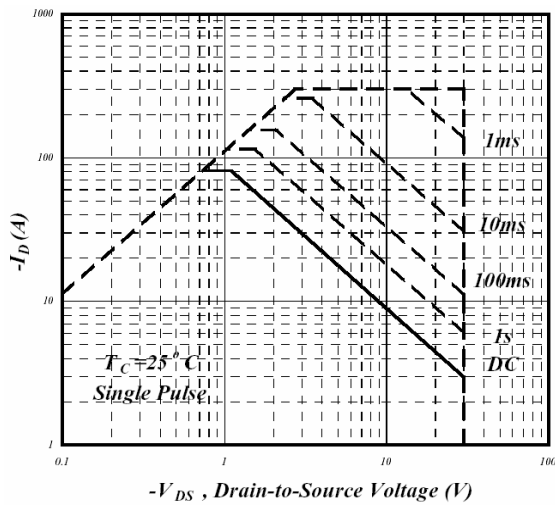
**Fig 6. Gate Threshold Voltage v.s. Junction Temperature**



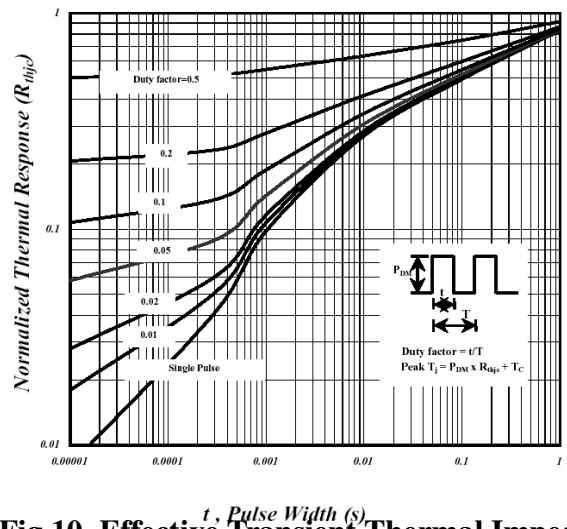
**Fig 7. Gate Charge Characteristics**



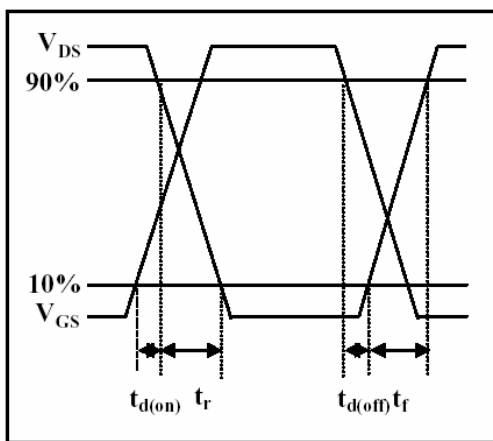
**Fig 8. Typical Capacitance Characteristics**



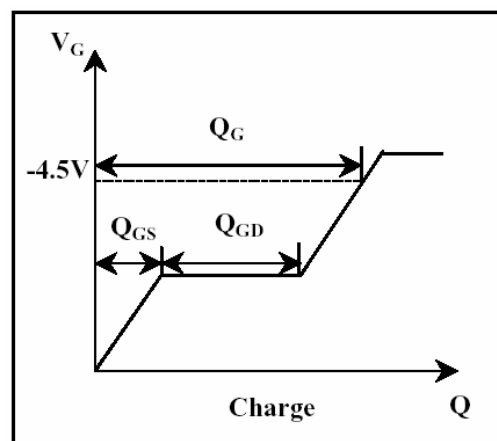
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**