

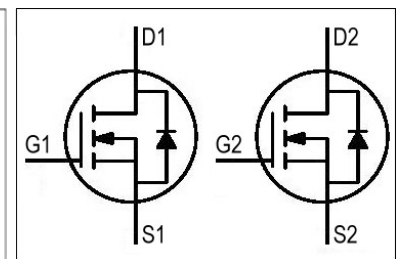
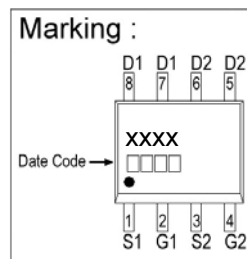
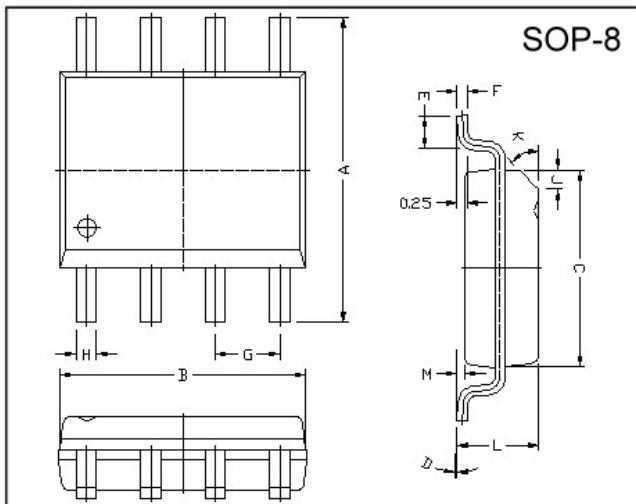
BV _{DSS}	60V
R _{DS(ON)}	28mΩ
I _D	5A

N-CHANNEL ENHANCEMENT MODE POWER MOSFET
Description

The BP4946 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

Features

- *High Breakdown Voltage
- *Low On-resistance
- *RoHS Compliant

Package Dimensions


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	M	0.10	0.25
B	4.80	5.00	H	0.35	0.49
C	3.80	4.00	L	1.35	1.75
D	0°	8°	J	0.375 REF.	
E	0.40	0.90	K	45°	
F	0.19	0.25	G	1.27 TYP.	

Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V _{DS}	60	V
Gate-Source Voltage	V _{GS}	±25	V
Continuous Drain Current ³ , V _{GS} @10V	I _D @TA=25°C	5	A
Continuous Drain Current ³ , V _{GS} @10V	I _D @TA=70°C	6.1	A
Pulsed Drain Current ¹	I _{DM}	30	A
Total Power Dissipation	P _D @TA=25°C	2	W
Linear Derating Factor		0.016	W/°C
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55 ~ +150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient ³ Max.	R _{thj-amb}	62.5	°C/W

Electrical Characteristics (T_j = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV _{DSS}	60	-	-	V	V _{GS} =0, I _D =250uA
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _j	-	0.06	-	V/°C	Reference to 25°C, I _D =1mA
Gate Threshold Voltage	V _{GS(th)}	1.0	-	3.0	V	V _{DS} =V _{GS} , I _D =250uA
Forward Transconductance	g _{fs}	-	12	-	S	V _{DS} =10V, I _D =7A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±25V
Drain-Source Leakage Current(T _j =25°C)	I _{DSS}	-	-	1	uA	V _{DS} =60V, V _{GS} =0
Drain-Source Leakage Current(T _j =70°C)		-	-	25	uA	V _{DS} =48V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	-	28	m	V _{GS} =10V, I _D =7A
		-	-	32		V _{GS} =4.5V, I _D =5A
Total Gate Charge ²	Q _g	-	26	40	nC	I _D =7A V _{DS} =48V V _{GS} =4.5V
Gate-Source Charge	Q _{gs}	-	6	-		
Gate-Drain ("Miller") Charge	Q _{gd}	-	14	-		
Turn-on Delay Time ²	T _{d(on)}	-	14	-	ns	V _{DS} =30V I _D =1A V _{GS} =10V R _G =3.3 R _D =30
Rise Time	T _r	-	7	-		
Turn-off Delay Time	T _{d(off)}	-	40	-		
Fall Time	T _f	-	13	-		
Input Capacitance	C _{iss}	-	2320	3700	pF	V _{GS} =0V V _{DS} =25V f=1.0MHz
Output Capacitance	C _{oss}	-	200	-		
Reverse Transfer Capacitance	C _{rss}	-	170	-		
Gate Resistance	R _g	-	0.86	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V _{SD}	-	-	1.2	V	I _S =1.7A, V _{GS} =0V
Reverse Recovery Time ²	T _{rr}	-	34	-	ns	I _S =7A, V _{GS} =0V
Reverse Recovery Charge	Q _{rr}	-	48	-	nC	di/dt=100A/μs

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

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

3. Surface mounted on 1 in² copper pad of FR4 board; 135°C/W when mounted on Min. copper pad.

Characteristics Curve

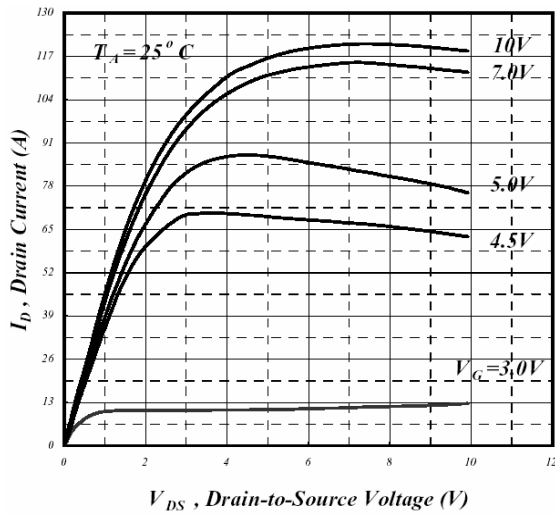


Fig 1. Typical Output Characteristics

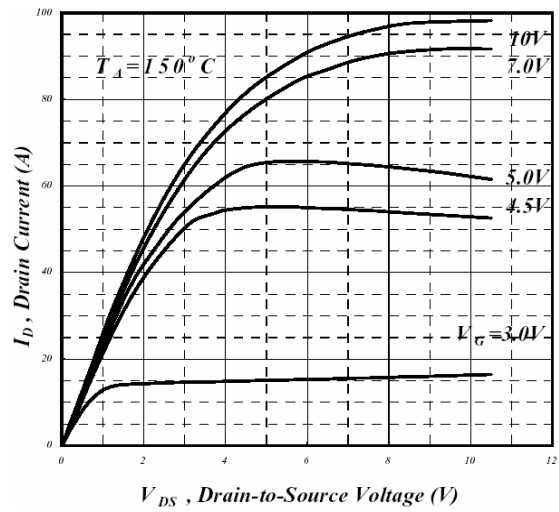


Fig 2. Typical Output Characteristics

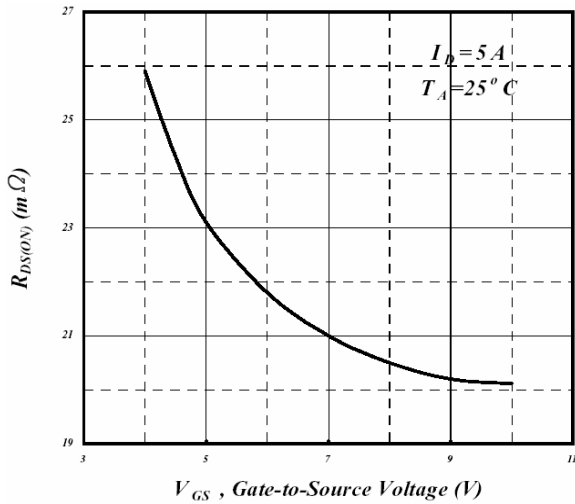


Fig 3. On-Resistance v.s. Gate Voltage

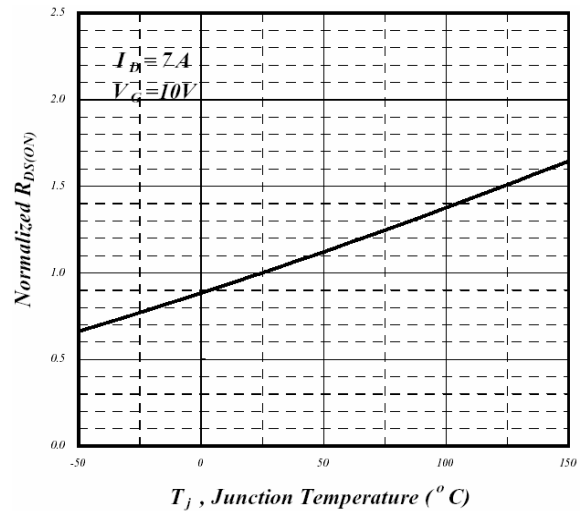


Fig 4. Normalized On-Resistance v.s. Junction Temperature

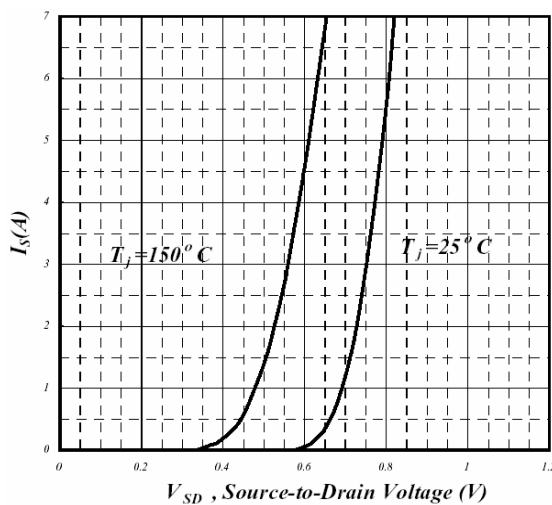


Fig 5. Forward Characteristics of Reverse Diode

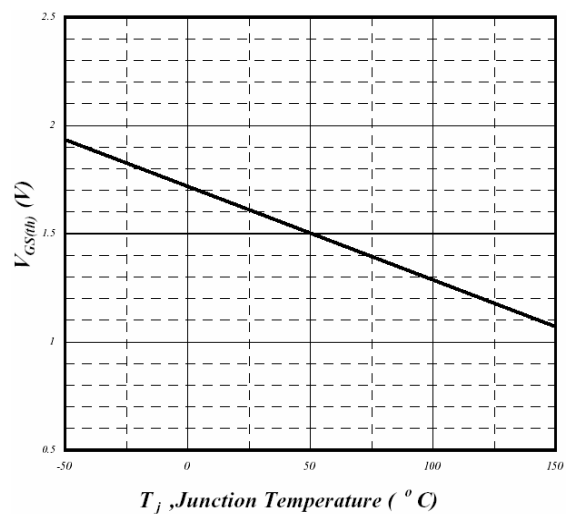


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

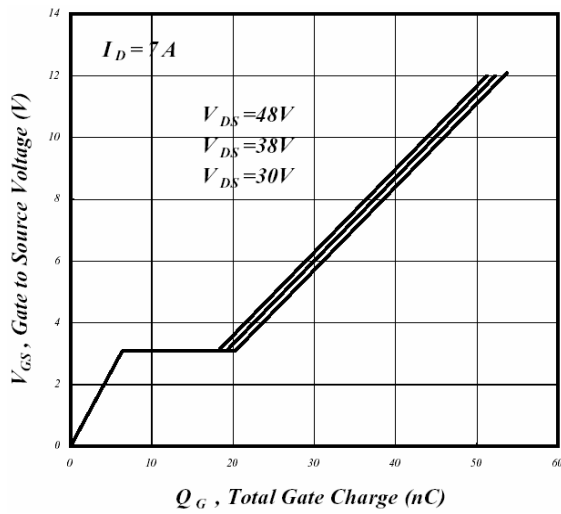


Fig 7. Gate Charge Characteristics

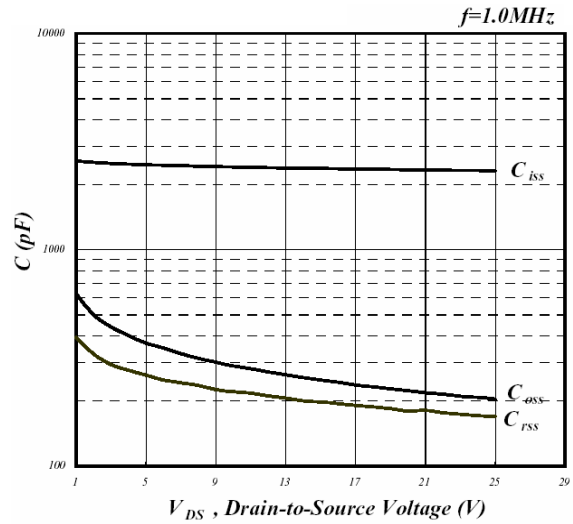


Fig 8. Typical Capacitance Characteristics

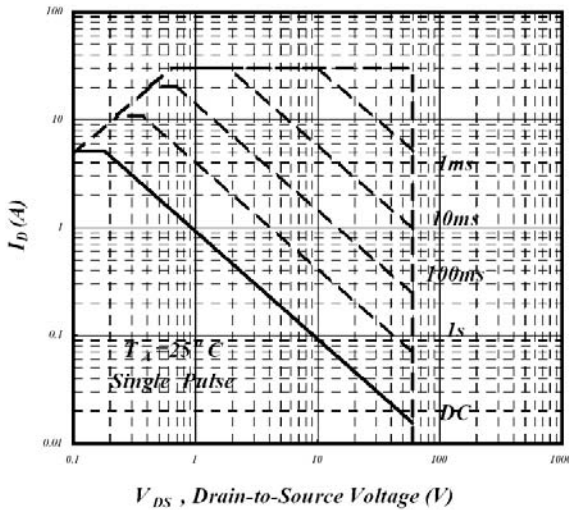


Fig 9. Maximum Safe Operating Area

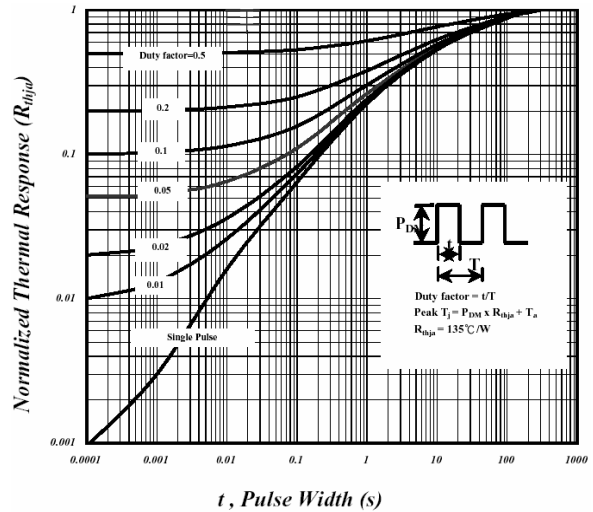


Fig 10. Effective Transient Thermal Impedance

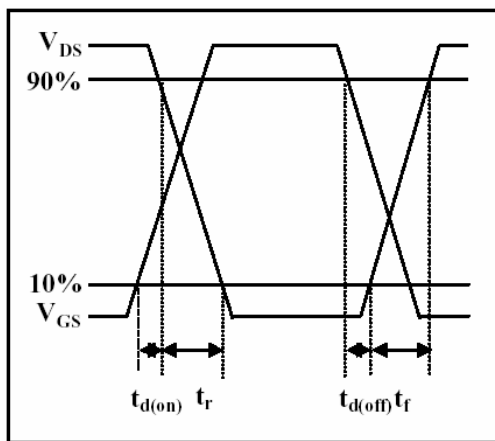


Fig 11. Switching Time Waveform

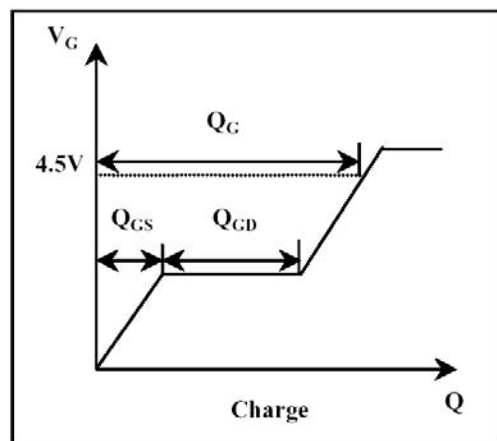


Fig 12. Gate Charge Waveform