

BP957S

P-CHANNEL ENHANCEMENT MODE POWER MOSFET

BV_{DSS}	-60V
$R_{DS(ON)}$	90m Ω
I_D	-15A

Description

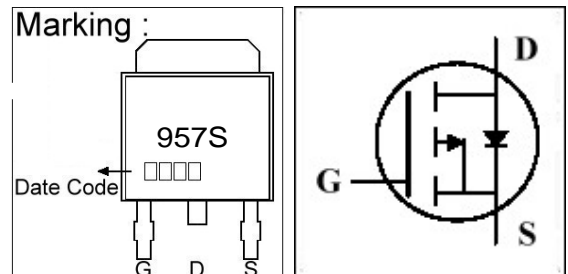
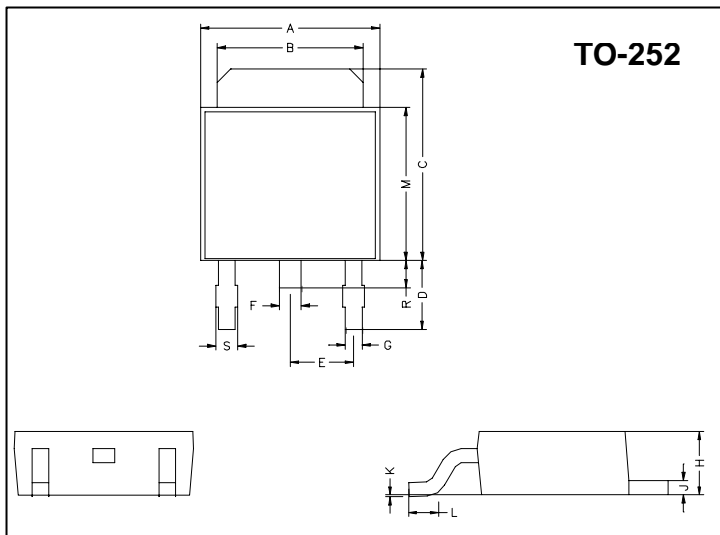
The BP957S provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness.

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}	-60	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=25^\circ C$	-15	A
Continuous Drain Current, $V_{GS}@10V$	$I_D @T_C=100^\circ C$	-9.5	A
Pulsed Drain Current ¹	I_{DM}	-45	A
Total Power Dissipation	$P_D @T_C=25^\circ C$	36	W
Linear Derating Factor		0.29	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-c}	3.5	$^\circ C/W$
Thermal Resistance Junction-ambient Max.	R_{thj-a}	110	$^\circ C/W$

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	BV _{DSS} / T _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}	-	14	-	S	V _{DS} =-10V, I _D =-9A
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 =150°C)		-	-	-25	uA	V _{DS} =-48V, V _{GS} =0
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	-	90	mΩ	V _{GS} =-10V, I _D =-12A
		-	-	120		V _{GS} =-4.5V, I _D =-9A
Total Gate Charge ²	Q _g	-	17	27	nC	I _D =-9A V _{DS} =-48V V _{GS} =-4.5V
Gate-Source Charge	Q _{gs}	-	5	-		
Gate-Drain ("Miller") Change	Q _{gd}	-	6	-		
Turn-on Delay Time ²	T _{d(on)}	-	10	-	ns	V _{DS} =-30V I _D =-9A V _{GS} =-10V R _G =3.3Ω R _D =3.3Ω
Rise Time	T _r	-	19	-		
Turn-off Delay Time	T _{d(off)}	-	46	-		
Fall Time	T _f	-	53	-		
Input Capacitance	C _{iss}	-	1660	2660	pF	V _{GS} =0V V _{DS} =-25V f=1.0MHz
Output Capacitance	C _{oss}	-	160	-		
Reverse Transfer Capacitance	C _{rss}	-	100	-		

Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage ²	V _{SD}	-	-	-1.2	V	I _S =-9A, V _{GS} =0V
Reverse Recovery Time ²	T _{rr}	-	56	-	ns	I _S =-9A, V _{GS} =0V di/dt=100A/us
Reverse Recovery Charge	Q _{rr}	-	159	-	nC	

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

2. Pulse width_≤300us, duty cycle_≤2%.

Characteristics Curve

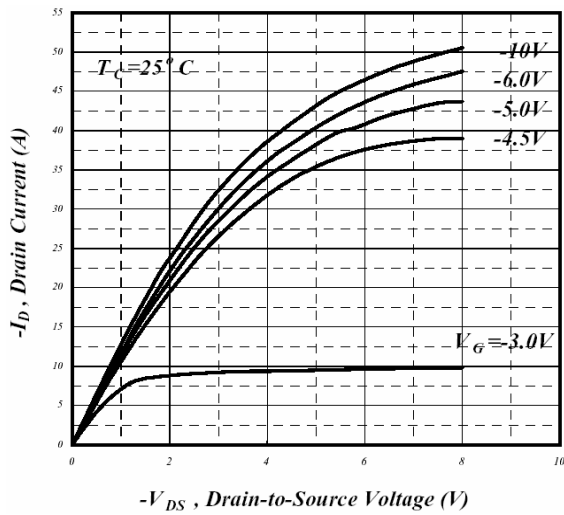


Fig 1. Typical Output Characteristics

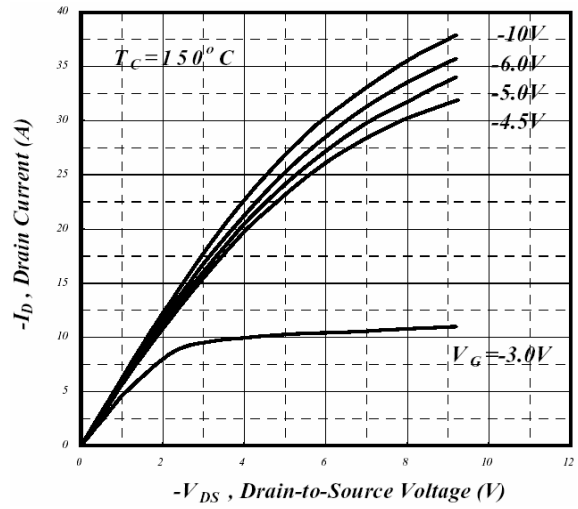


Fig 2. Typical Output Characteristics

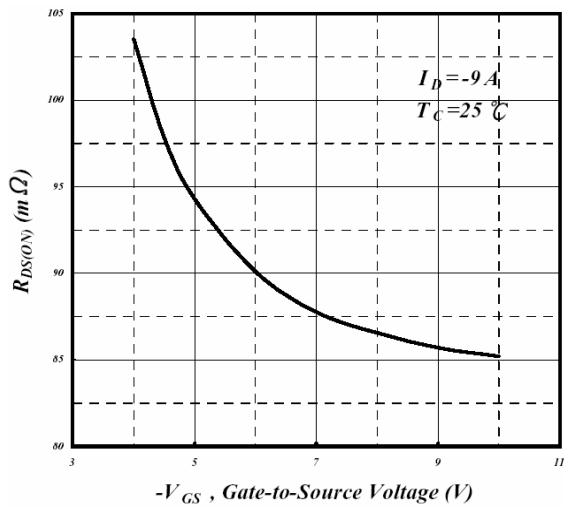


Fig 3. On-Resistance v.s. Gate Voltage

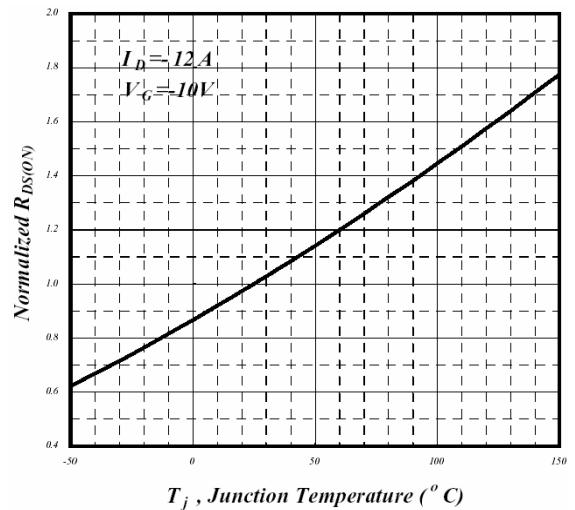


Fig 4. Normalized On-Resistance v.s. Junction Temperature

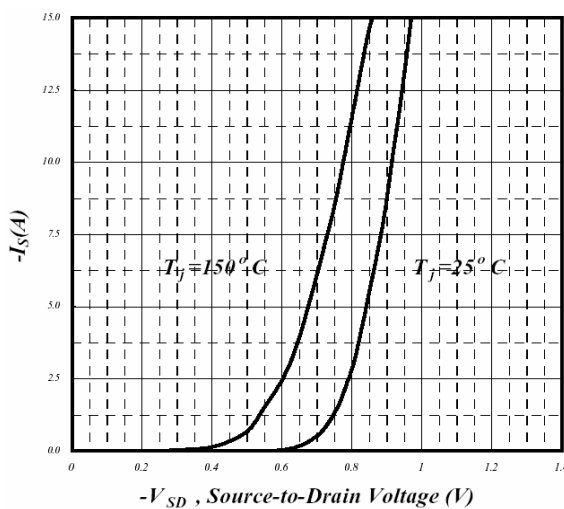


Fig 5. Forward Characteristics of Reverse Diode

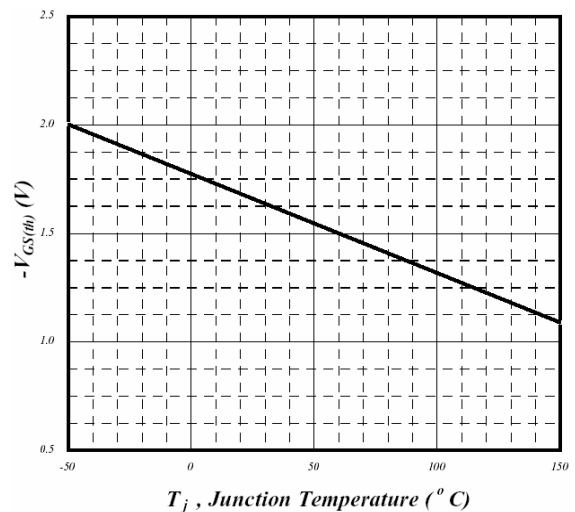


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

$f=1.0\text{MHz}$

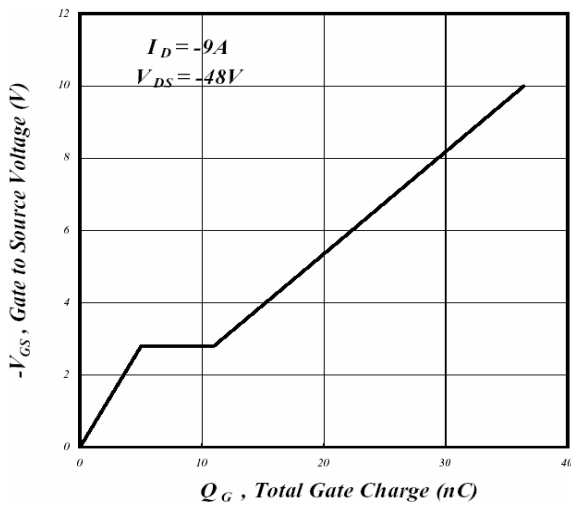


Fig 7. Gate Charge Characteristics

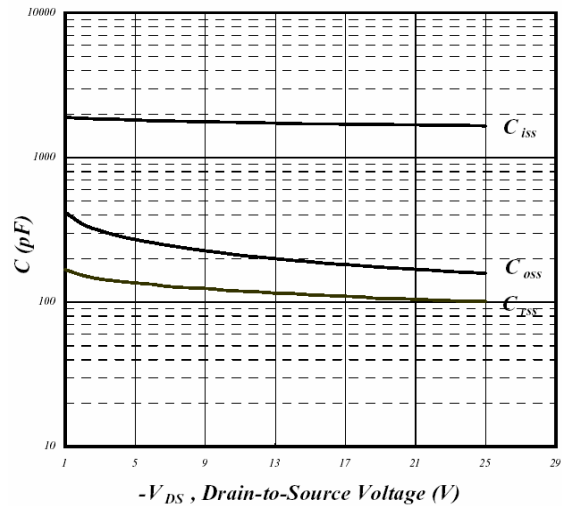


Fig 8. Typical Capacitance Characteristics

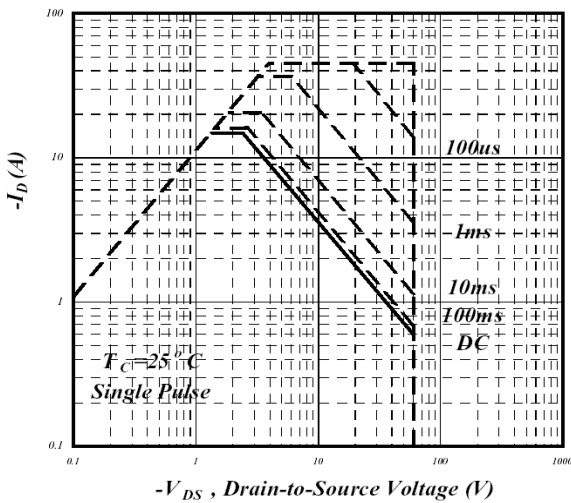


Fig 9. Maximum Safe Operating Area

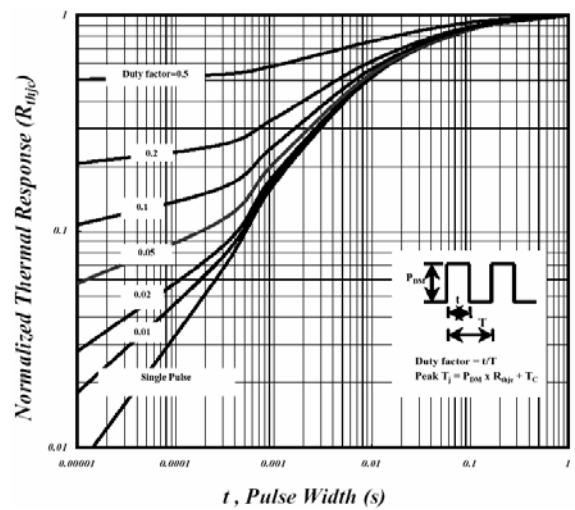


Fig 10. Effective Transient Thermal Impedance

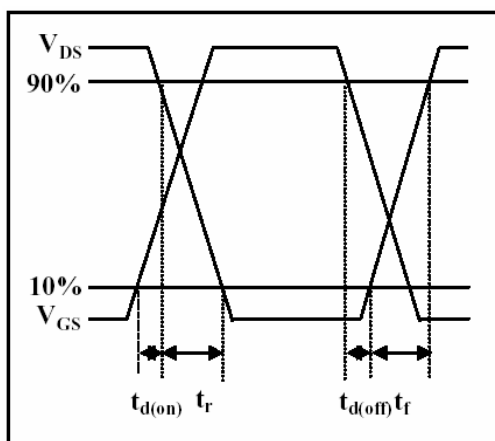


Fig 11. Switching Time Waveform

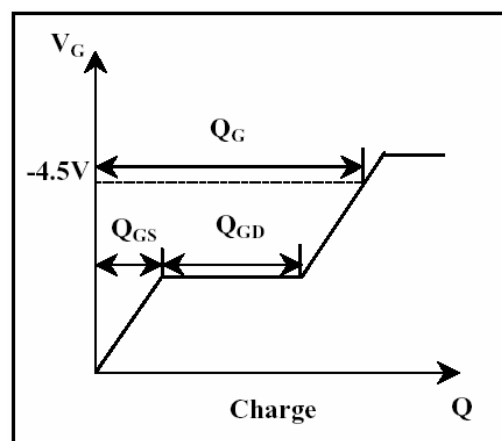


Fig 12. Gate Charge Waveform