

RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

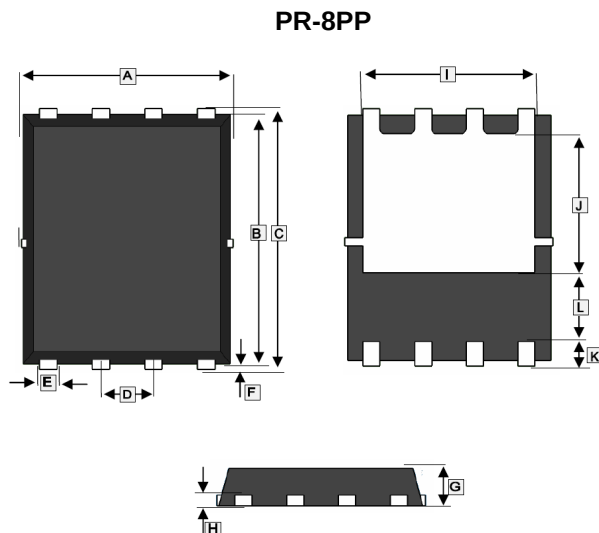
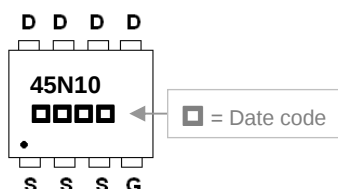
DESCRIPTION

The SPR45N10 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The PR-8PP package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- Lower Gate Charge
- Simple Drive Requirement
- Fast Switching Characteristic

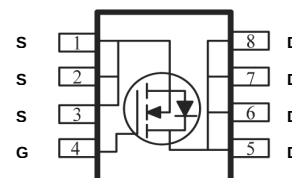
MARKING



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.9	5.1	G	0.8	1.0
B	5.7	5.9	H	0.254 Ref.	
C	5.95	6.2	I	4.0 Ref.	
D	1.27 BSC.		J	3.4 Ref.	
E	0.35	0.49	K	0.6 Ref.	
F	0.1	0.2	L	1.4 Ref.	

PACKAGE INFORMATION

Package	MPQ	Leader Size
PR-8PP	3K	13 inch



ABSOLUTE MAXIMUM RATINGS ($T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V _{DS}	100	V
Gate-Source Voltage		V _{GS}	±20	V
Continuous Drain Current ¹ @V _{GS} =10V	T _C =25℃	I _D	45	A
	T _C =100℃		28	A
Pulsed Drain Current ²	T _C =25℃	I _{DM}	100	A
Single Pulse Avalanche Energy ³		EAS	98	mJ
Avalanche Current		I _{AS}	41	A
Total Power Dissipation ⁴	T _C =25℃	P _D	90	W
Operating Junction & Storage Temperature		T _J , T _{STG}	-55~150	℃
Thermal Resistance Rating				
Thermal Resistance Junction-Ambient ¹ (Max).		R _{θJA}	36	℃ / W
Thermal Resistance Junction-Case ¹ (Max).		R _{θJC}	1.4	℃ / W

ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Teat Conditions
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	100	-	-	V	V _{GS} =0, I _D = 250μA
Gate-Threshold Voltage	V _{GS(th)}	2.5	-	4.5	V	V _{DS} =V _{GS} , I _D =250μA
Forward Tranconductance	g _{fs}	-	27	-	S	V _{DS} =5V, I _D =30A
Gate-Source Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V
Drain-Source Leakage Current	I _{DSS}	-	-	1	μA	V _{DS} =80V, V _{GS} =0, T _J =25℃
		-	-	5		V _{DS} =80V, V _{GS} =0, T _J =55℃
Static Drain-Source On-Resistance ²	R _{DS(ON)}	-	19	22	mΩ	V _{GS} =10V, I _D =30A
		-	25	30		V _{GS} =7V, I _D =15A
Gate Resistance	R _g	-	1.9	3.8	Ω	f =1.0MHz
Total Gate Charge	Q _g	-	27.6	-	nC	I _D =30A V _{DS} =80V V _{GS} =10V
Gate-Source Charge	Q _{gs}	-	11.4	-		
Gate-Drain (“Miller”) Charge	Q _{gd}	-	7.9	-		
Turn-on Delay Time ²	T _{d(on)}	-	15.6	-	nS	V _{DD} =50V I _D =30A V _{GS} =10V R _G =3.3Ω
Rise Time	T _r	-	17.2	-		
Turn-off Delay Time	T _{d(off)}	-	16.8	-		
Fall Time	T _f	-	9.2	-		
Input Capacitance	C _{iss}	-	1890	-	pF	V _{GS} =0 V _{DS} =15V f =1.0MHz
Output Capacitance	C _{oss}	-	268	-		
Reverse Transfer Capacitance	C _{rss}	-	67	-		
Guaranteed Avalanche Characteristics						
Single Pulse Avalanche Energy ⁵	EAS	53	-	-	mJ	V _{DD} =25V, L=0.1mH, I _{AS} =30A
Source-Drain Diode						
Diode Forward Voltage ²	V _{SD}	-	-	1	V	I _S =1A, V _{GS} =0V
Continuous Source Current ^{1,6}	I _S	-	-	45	A	V _G =V _D =0, Force Current
Pulsed Source Current ^{2,6}	I _{SM}	-	-	100	A	
Reverse Recovery Time	t _{rr}	-	34	-	nS	IF=30A, dI/dt=100A/μs, T _J =25℃
Reverse Recovery Charge	Q _{rr}	-	47	-	nC	

Note:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper , $\leq 10\text{sec}$, $125^\circ\text{C}/\text{W}$ at steady state
2. The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
3. The EAS data shows Max. rating . The test condition is $V_{DD}=25\text{V}, V_{GS}=10\text{V}, L=0.1\text{mH}, I_{AS}=41\text{A}$
4. The power dissipation is limited by 150°C junction temperature
5. The Min. value is 100% EAS tested guarantee.
6. The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

CHARACTERISTIC CURVES

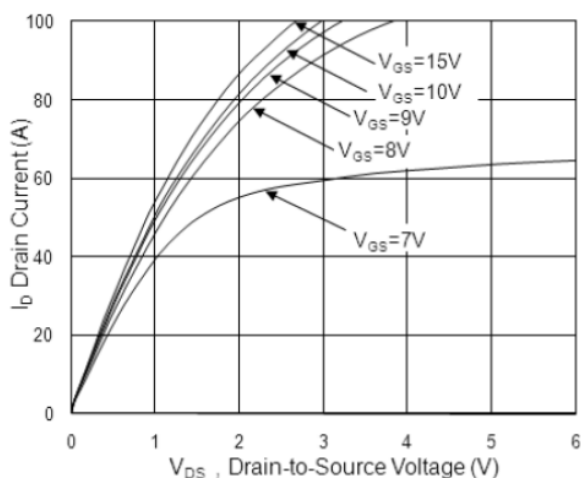


Fig.1 Typical Output Characteristics

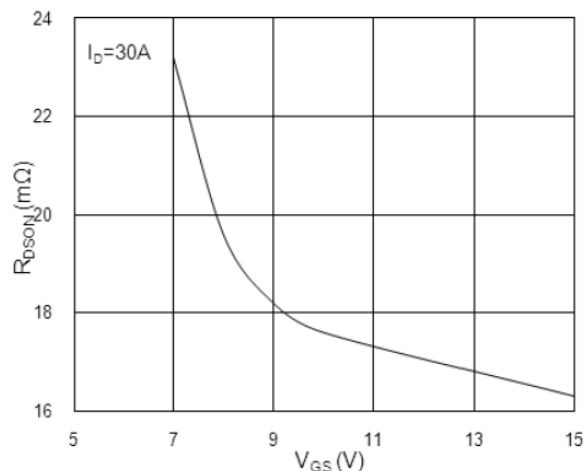


Fig.2 On-Resistance v.s Gate-Source

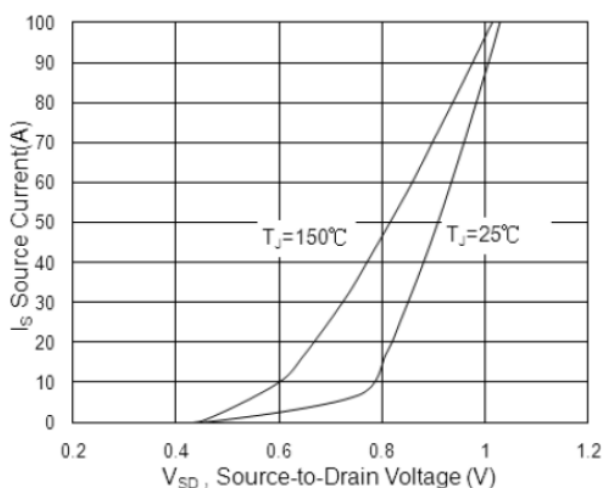


Fig.3 Forward Characteristics of Reverse

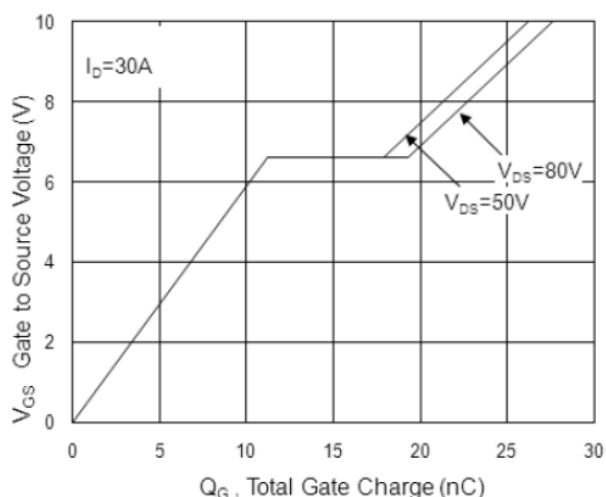


Fig.4 Gate-Charge Characteristics

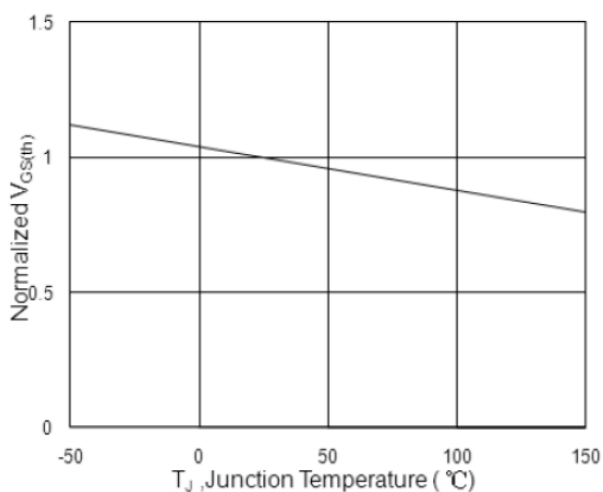


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

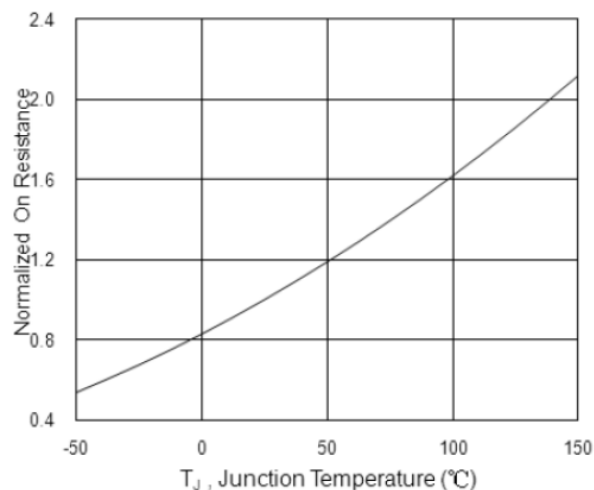


Fig.6 Normalized $R_{DS(on)}$ v.s T_J

CHARACTERISTIC CURVES

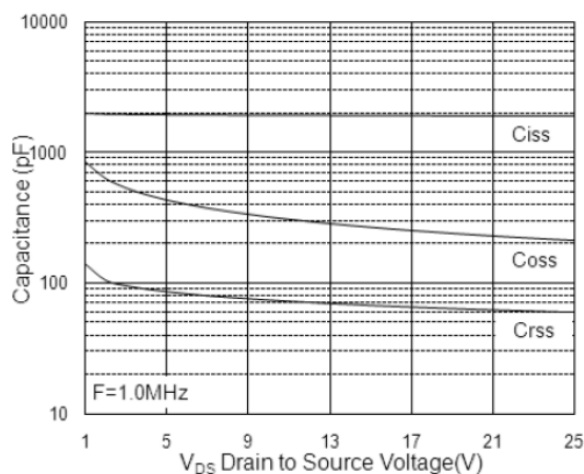


Fig.7 Capacitance

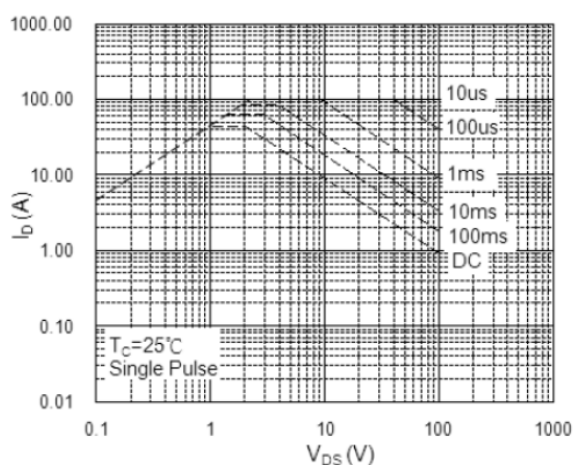


Fig.8 Safe Operating Area

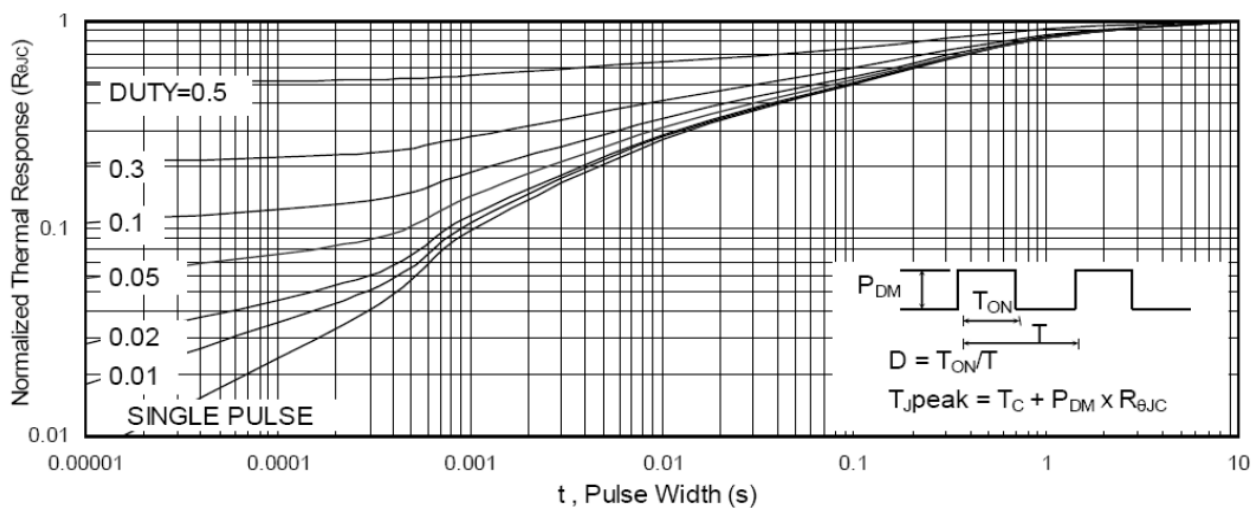


Fig.9 Normalized Maximum Transient Thermal Impedance

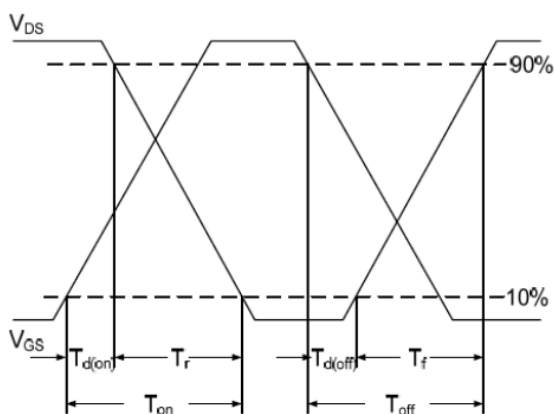


Fig.10 Switching Time Waveform

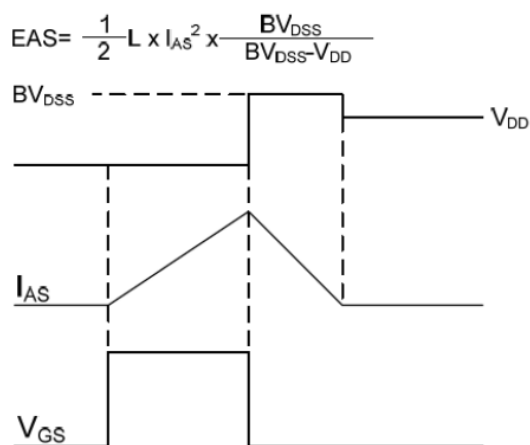


Fig.11 Unclamped Inductive Switching Waveform