

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

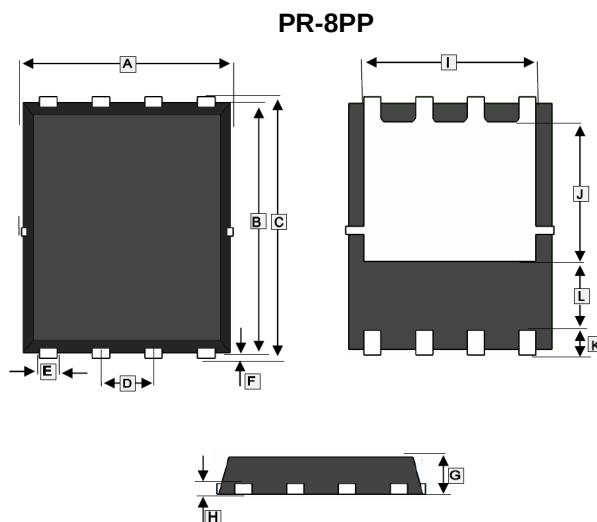
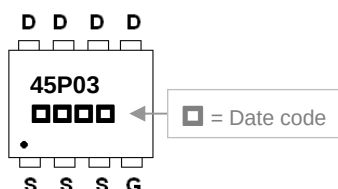
DESCRIPTION

The SPR45P03 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

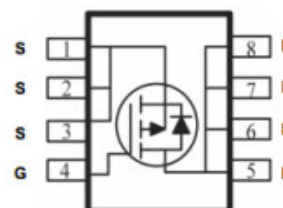
MARKING



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}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$	$T_C=25^\circ\text{C}$	-45	A
	$T_C=100^\circ\text{C}$	-30	A
	$T_A=25^\circ\text{C}$	-9.6	A
	$T_A=70^\circ\text{C}$	-7.7	A
Pulsed Drain Current ²	I_{DM}	-150	A
Single Pulse Avalanche Energy ³	EAS	264	mJ
Avalanche Current	I_{AS}	-42	A
Total Power Dissipation ⁴	P_D	48	W
Operating Junction & Storage Temperature	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Rating			
Thermal Resistance Junction-Ambient ¹ (Max).	$R_{\theta JA}$	62	$^\circ\text{C} / \text{W}$
Thermal Resistance Junction-Case ¹ (Max).	$R_{\theta JC}$	2.6	$^\circ\text{C} / \text{W}$

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}	-30	-	-	V	$V_{GS}=0$, $I_D = -250\mu A$
Gate-Threshold Voltage	$V_{GS(th)}$	-1	-	-2.5	V	$V_{DS}=V_{GS}$, $I_D = -250\mu A$
Forward Tranconductance	g_{fs}	-	30	-	S	$V_{DS}= -5V$, $I_D = -30A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}= \pm 20V$
Drain-Source Leakage Current	I_{DSS}	-	-	-1	μA	$V_{DS}= -24V$, $V_{GS}=0$, $T_J=25^{\circ}C$
		-	-	-5		$V_{DS}= -24V$, $V_{GS}=0$, $T_J=55^{\circ}C$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	15	m Ω	$V_{GS}= -10V$, $I_D = -30A$
		-	-	25		$V_{GS}= -4.5V$, $I_D = -15A$
Gate Resistance	R_g	-	9	18	Ω	f =1.0MHz
Total Gate Charge	Q_g	-	22	-	nC	$I_D = -15A$ $V_{DS}= -15V$ $V_{GS}= -4.5V$
Gate-Source Charge	Q_{gs}	-	8.7	-		
Gate-Drain (“Miller”) Charge	Q_{gd}	-	7.2	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	8	-	nS	$V_{DD}= -15V$ $I_D = -15A$ $V_{GS}= -10V$ $R_G=3.3\Omega$
Rise Time	T_r	-	73.7	-		
Turn-off Delay Time	$T_{d(off)}$	-	61.8	-		
Fall Time	T_f	-	24.4	-		
Input Capacitance	C_{iss}	-	2215	-	pF	$V_{GS} = 0$ $V_{DS}= -15V$ f =1.0MHz
Output Capacitance	C_{oss}	-	310	-		
Reverse Transfer Capacitance	C_{rss}	-	237	-		
Guaranteed Avalanche Characteristics						
Single Pulse Avalanche Energy ⁵	EAS	66	-	-	mJ	$V_{DD}= -25V$, L=0.1mH, $I_{AS}= -21A$
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}	-	-	-150	A	
Reverse Recovery Time	t_{rr}	-	19	-	nS	$IF = -15A$, $dI/dt=100A/\mu s$, $T_J=25^{\circ}C$
Reverse Recovery Charge	Q_{rr}	-	9	-	nC	

Note:

- 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
- The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- The EAS data shows Max. rating . The test condition is $V_{DD} = -25\text{V}$, $V_{GS} = -10\text{V}$, $L=0.1\text{mH}$, $I_{AS} = -50\text{A}$
- The power dissipation is limited by 150°C junction temperature
- The Min. value is 100% EAS tested guarantee.
- The data is theoretically the same as I_D and I_{DM} , in real applications , should be limited by total power dissipation.

CHARACTERISTIC CURVES

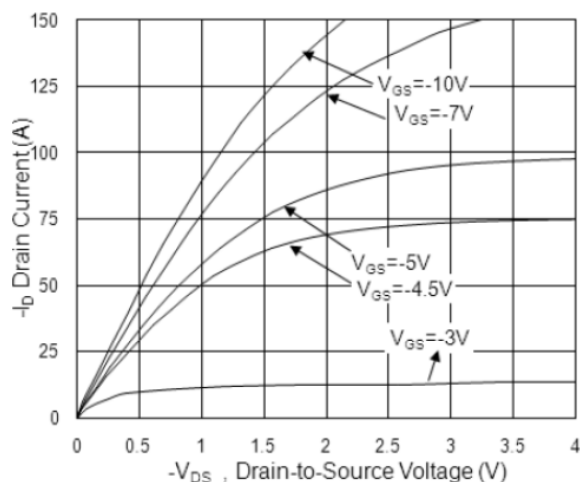


Fig.1 Typical Output Characteristics

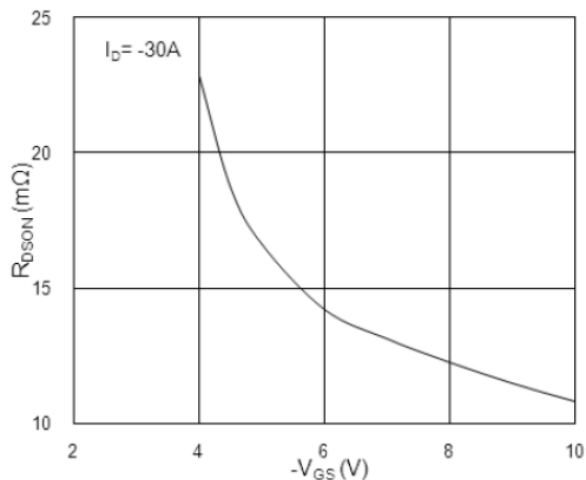


Fig.2 On-Resistance vs. G-S Voltage

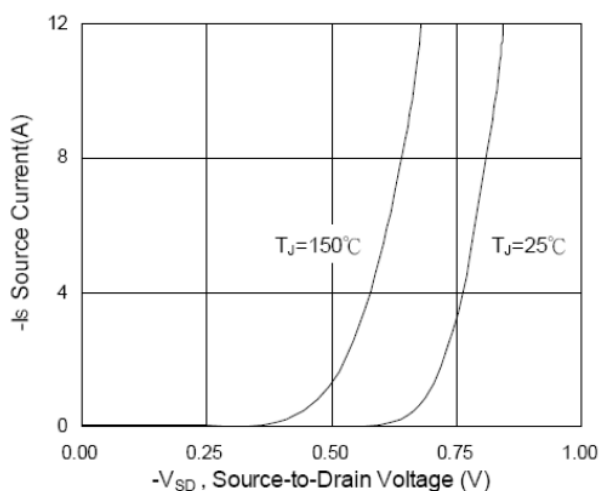


Fig.3 Forward Characteristics of Reverse

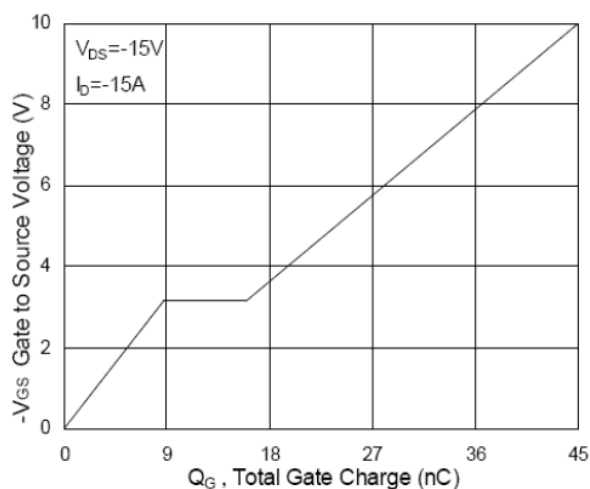


Fig.4 Gate-charge Characteristics

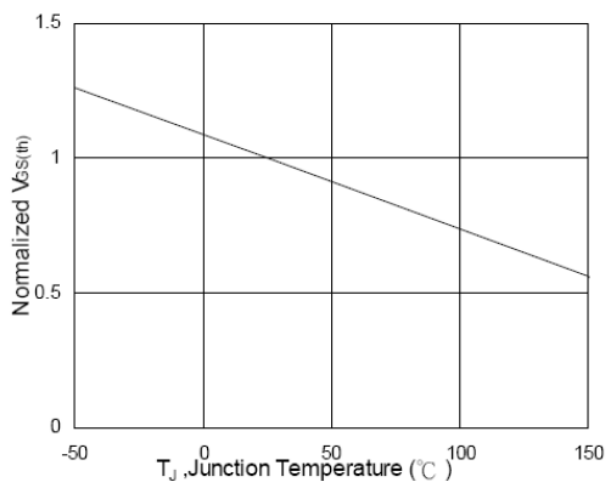


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

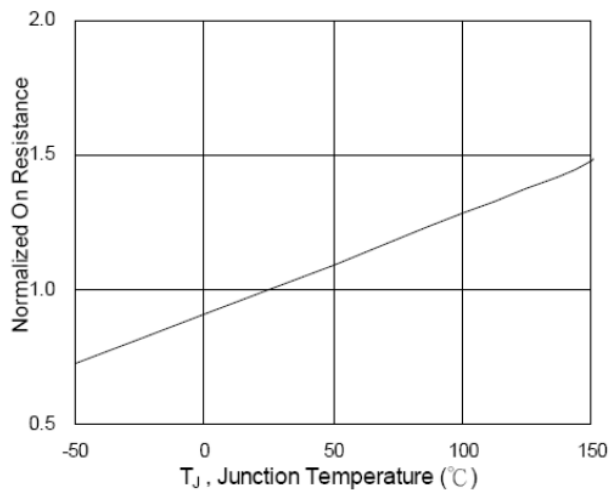


Fig.6 Normalized $R_{DS(ON)}$ vs. T_J

CHARACTERISTIC CURVES

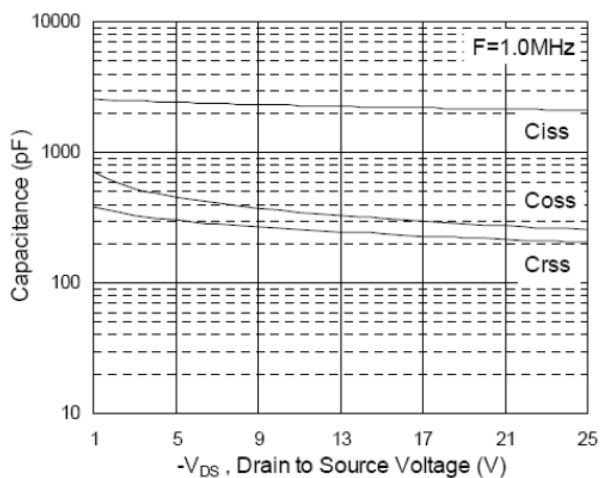


Fig.7 Capacitance

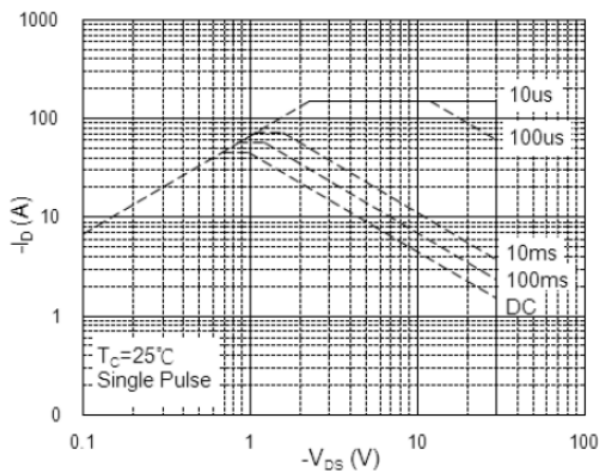


Fig.8 Safe Operating Area

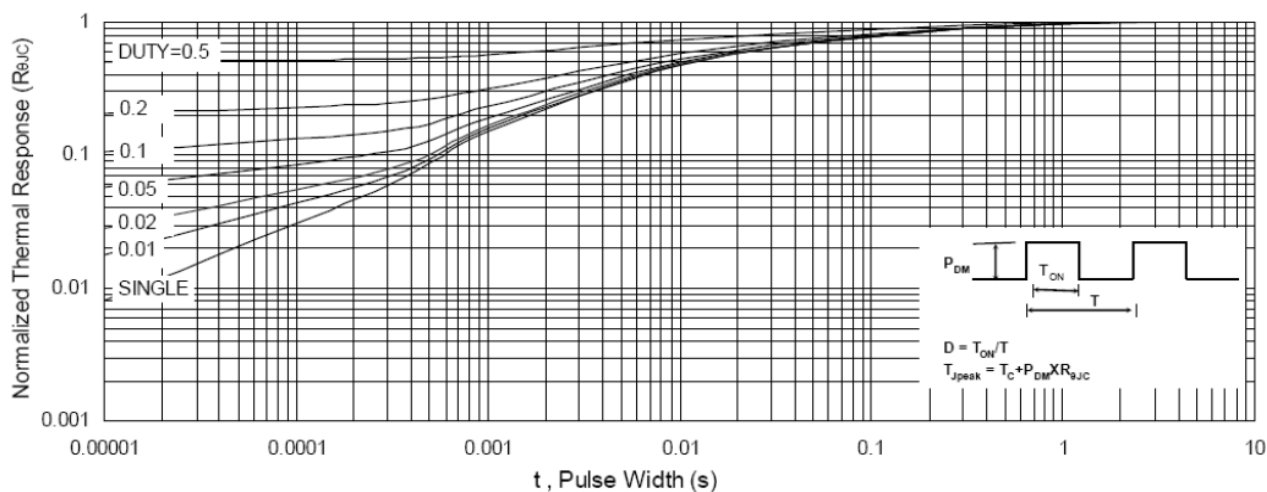


Fig.9 Normalized Maximum Transient Thermal Impedance

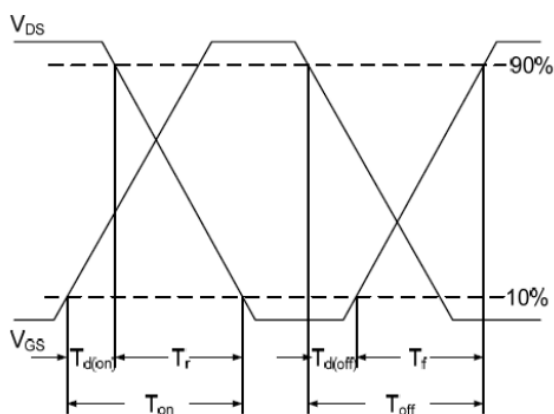


Fig.10 Switching Time Waveform

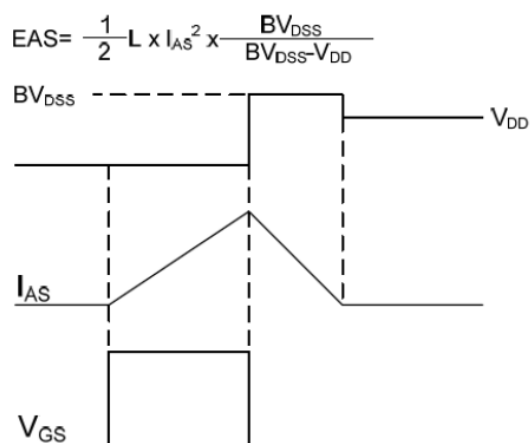


Fig.11 Unclamped Inductive Switching Waveform