Elektronische Bauelemente

SPR52P04-C

-52A, -40V, $R_{DS(ON)}$ 13mΩ

P-Channel Enhancement Mode Power MOSFET

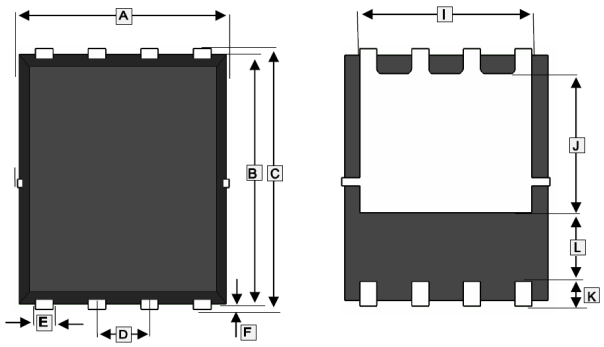
RoHS Compliant Product

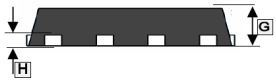
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SPR52P04-C 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.

PR-8PP



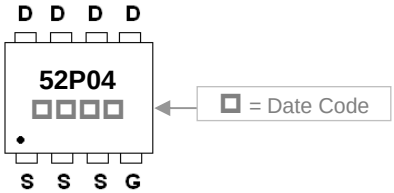


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.90	5.10	G	0.80	1.10
B	5.70	5.90	H	0.254 REF.	
C	5.90	6.20	I	4.00 REF.	
D	1.27 BSC.		J	3.40 REF.	
E	0.33	0.51	K	0.60 REF.	
F	0.06	0.20	L	1.40 REF.	

FEATURES

- Advanced High Cell Density Trench Technology
- Lower Gate Charge
- Green Device Available

MARKING

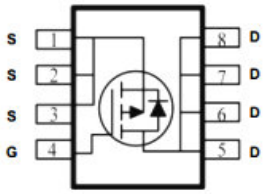


PACKAGE INFORMATION

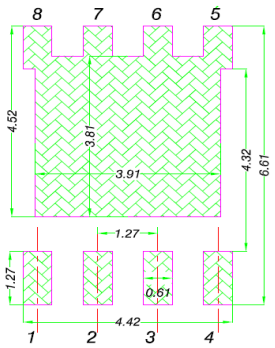
Package	MPQ	Leader Size
PR-8PP	3K	13 inch

ORDER INFORMATION

Part Number	Type
SPR52P04-C	Lead (Pb)-free and Halogen-free



Mounting Pad Layout



*Dimensions in millimeters

ABSOLUTE MAXIMUM RATINGS (T_A=25℃ unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}= -10V	T_C=25℃	I_D	-52	A
	T_C=100℃		-32	
Pulsed Drain Current [2]		I_{DM}	-105	A
Power Dissipation [3]	T_C=25℃	P_D	52.1	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62	℃/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	2.4	

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	-40	-	-	V	V_{GS}=0, I_D= -250μA
Gate-Threshold Voltage		$V_{GS(th)}$	-1	-	-2.5	V	V_{DS}=V_{GS}, I_D= -250μA
Forward Transconductance		g_{fs}	-	24	-	S	V_{DS}= -5V, I_D= -18A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V, V_{DS}=0
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	-1	uA	V_{DS}= -32V, V_{GS}=0
	T_J=55℃		-	-	-5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	10.5	13	mΩ	V_{GS}= -10V, I_D= -18A
			-	15	20		V_{GS}= -4.5V, I_D= -12A
Total Gate Charge		Q_g	-	27.9	-	nC	I_D= -12A V_{DS}= -20V V_{GS}= -4.5V
Gate-Source Charge		Q_{gs}	-	7.7	-		
Gate-Drain Change		Q_{gd}	-	7.5	-		
Turn-on Delay Time		$T_{d(on)}$	-	40	-	nS	V_{DD}= -15V I_D= -1A V_{GS}= -10V R_G=3.3Ω
Rise Time		T_r	-	35.2	-		
Turn-off Delay Time		$T_{d(off)}$	-	100	-		
Fall Time		T_f	-	9.6	-		
Input Capacitance		C_{iss}	-	3500	-	pF	V_{GS}=0 V_{DS}= -15V f=1MHz
Output Capacitance		C_{oss}	-	323	-		
Reverse Transfer Capacitance		C_{rss}	-	222	-		
Source-Drain Diode							
Diode Forward Voltage [2]		V_{SD}	-	-	-1	V	I_S= -1A, V_{GS}=0, T_J=25℃
Continuous Source Current [1,4]		I_S	-	-	-52	A	V_G=V_D=0V, Force Current

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width ≤300μs, duty cycle≤2%.
3. The power dissipation is limited by 150℃ juncti on temperature.
4. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

CHARACTERISTIC CURVES

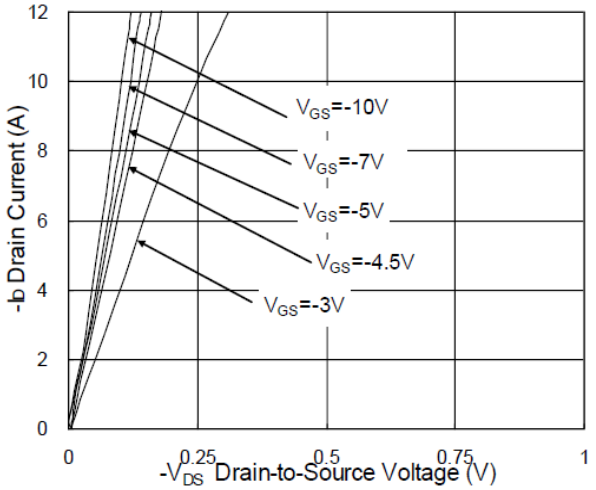


Fig.1 Typical Output Characteristics

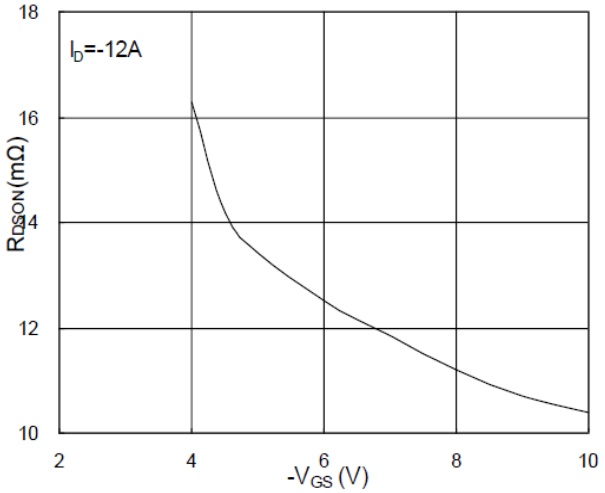


Fig.2 On-Resistance vs G-S Voltage

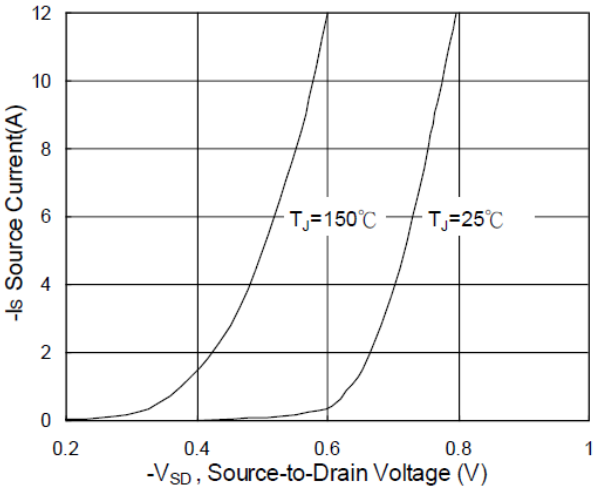


Fig.3 Source Drain Forward Characteristics

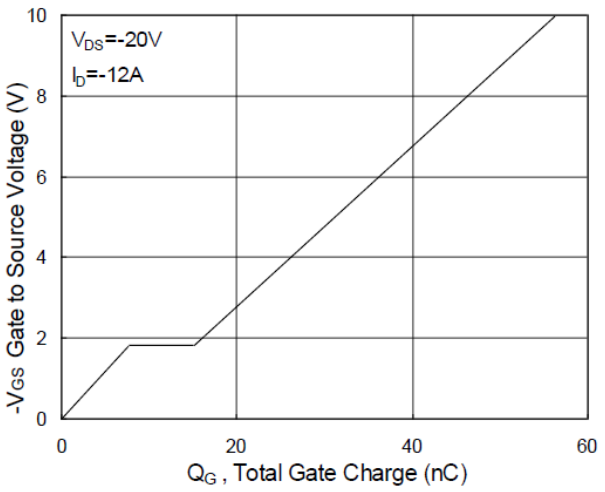


Fig.4 Gate-Charge Characteristics

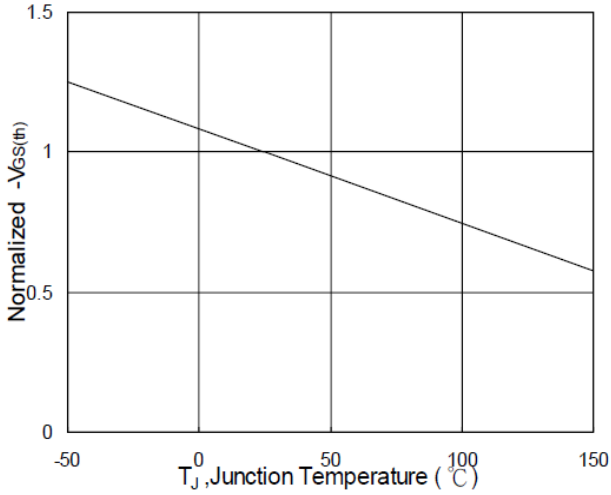


Fig.5 Normalized $V_{GS(th)}$ vs T_J

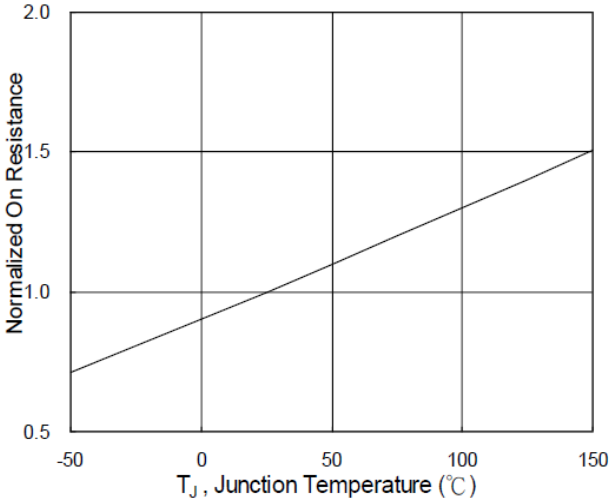


Fig.6 Normalized R_{DSON} vs T_J

CHARACTERISTIC CURVES

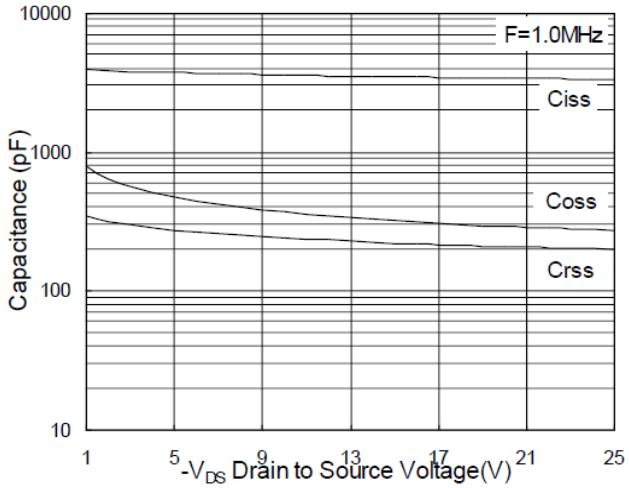


Fig.7 Capacitance

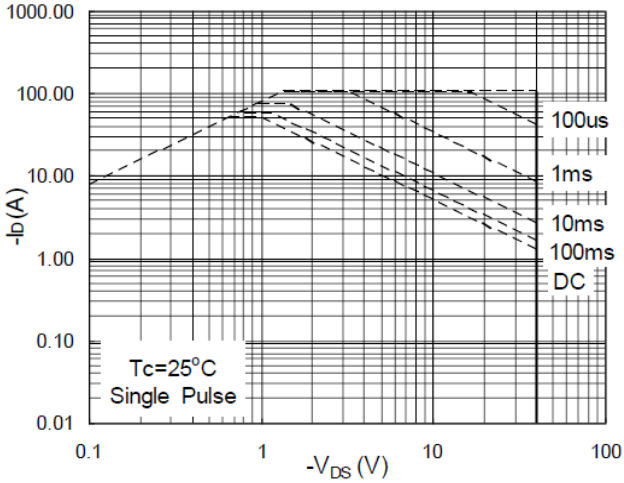


Fig.8 Safe Operating Area

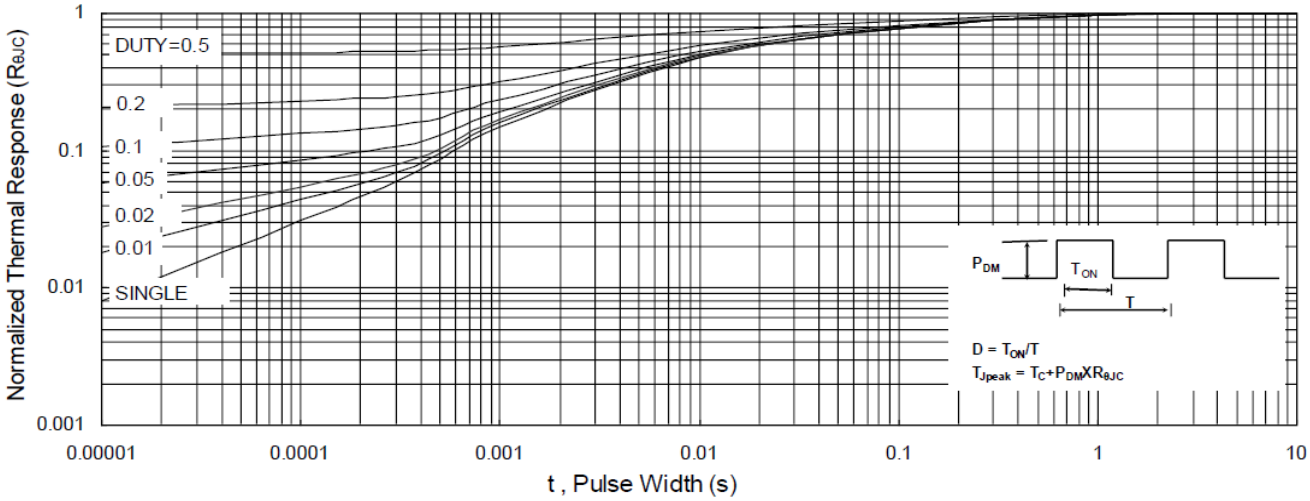


Fig.9 Normalized Maximum Transient Thermal Impedance

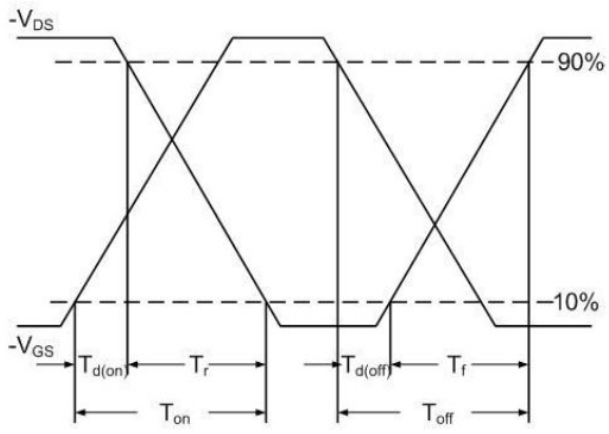


Fig.10 Switching Time Waveform

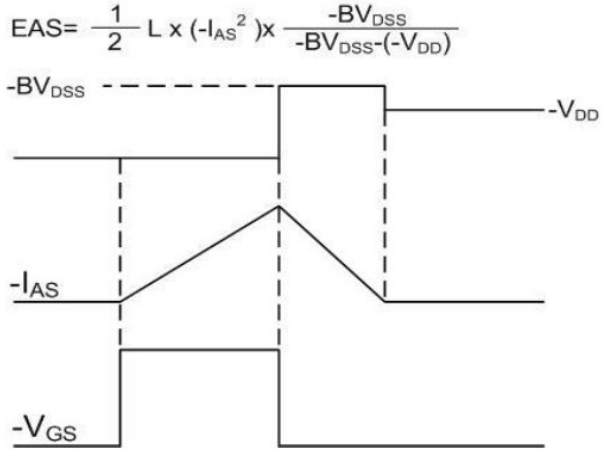


Fig.11 Unclamped Inductive Waveform