Elektronische Bauelemente

SPR50N06-C

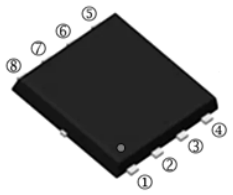
50A, 60V, $R_{DS(ON)}$ 12mΩ
N-Channel Enhancement Mode Power MOSFET

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

DESCRIPTION

The SPR50N06-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.

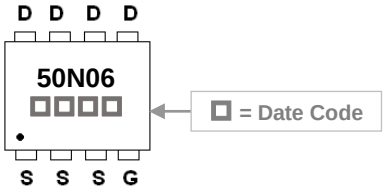
PR-8PP



FEATURES

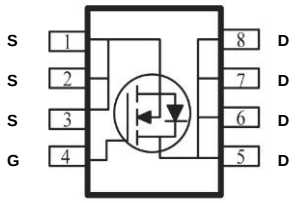
- Lower Gate Charge
- Advanced High Cell Density Trench Technology
- Green Device Available

MARKING



PACKAGE INFORMATION

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



ORDER INFORMATION

Part Number	Type
SPR50N06-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS (T_A=25°C unless otherwise specified)

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_C=25°C	I_D	50	A
	T_C=70°C		41	
Pulsed Drain Current [2]		I_{DM}	120	A
Power Dissipation	T_C=25°C	P_D	62.5	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1] (Max).		$R_{\theta JA}$	62	°C/W
Thermal Resistance Junction-Case [1] (Max).		$R_{\theta JC}$	2	

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=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Tranconductance		g_{fs}	-	42	-	S	V_{DS}=5V, I_D=30A
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25°C	I_{DSS}	-	-	1	uA	V_{DS}=48V, V_{GS}=0
	T_J=55°C		-	-	5		
Static Drain-Source On-Resistance [3]		$R_{DS(ON)}$	-	-	12	mΩ	V_{GS}=10V, I_D=30A
			-	-	15		V_{GS}=4.5V, I_D=15A
Total Gate Charge		Q_g	-	28.7	-	nC	I_D=15A V_{DS}=48V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	10.5	-		
Gate-Drain Change		Q_{gd}	-	9.9	-		
Turn-on Delay Time [2]		$T_{d(on)}$	-	10.4	-	nS	V_{DD}=30V I_D=15A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	9.2	-		
Turn-off Delay Time		$T_{d(off)}$	-	63	-		
Fall Time		T_f	-	4.8	-		
Input Capacitance		C_{iss}	-	3240	-	pF	V_{GS}=0 V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	210	-		
Reverse Transfer Capacitance		C_{rss}	-	146	-		
Source-Drain Diode							
Diode Forward Voltage [3]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0
Continuous Source Current [1]		I_S	-	-	50	A	V_G=V_D=0, Force Current
Pulsed Source Current [2]		I_{SM}	-	-	120		
Reverse Recovery Time		T_{rr}	-	18	-	nS	I_F=15A, dI/dt=100A/μs T_J=25°C
Reverse Recovery Charge		Q_{rr}	-	14	-	nC	

Notes:
1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. The Pulse width limited by maximum junction temperature, Pulse Width≤300μs, Duty Cycle≤2%.
3. The Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.

CHARACTERISTIC CURVES

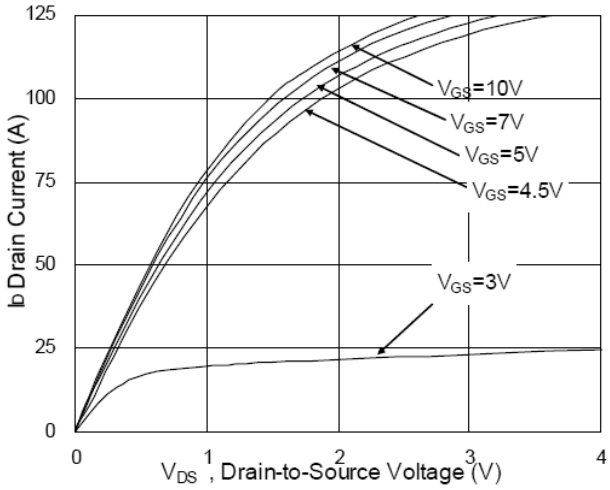


Fig.1 Typical Output Characteristics

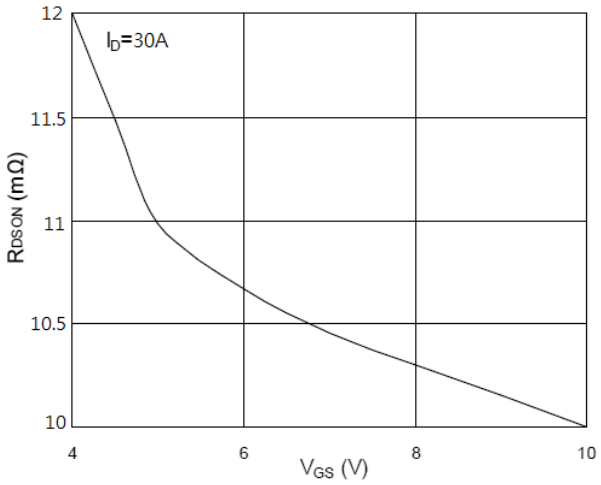


Fig.2 On-Resistance v.s Gate-Source

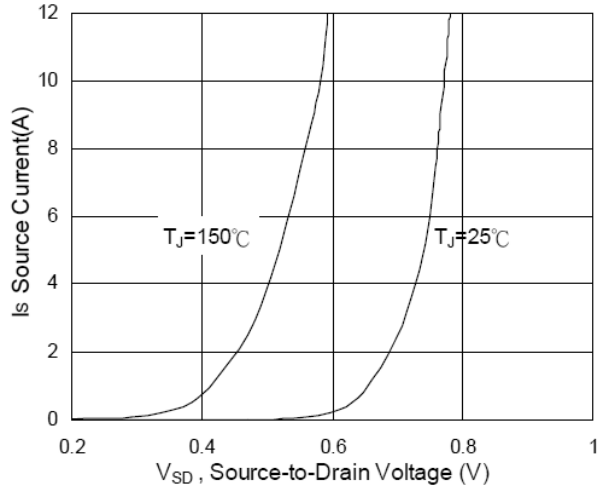


Fig.3 Forward Characteristics of Reverse

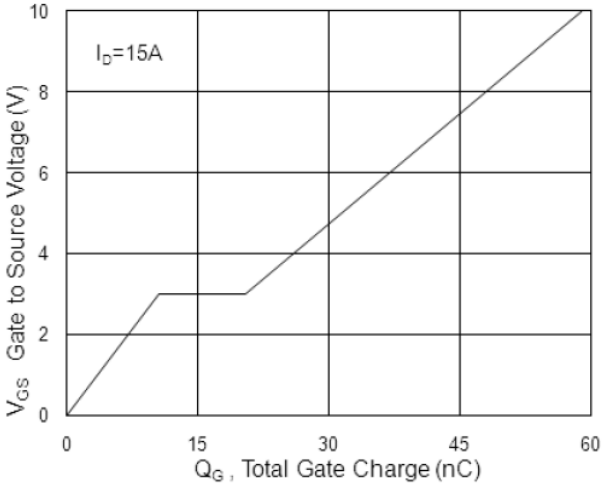


Fig.4 Gate-Charge Characteristics

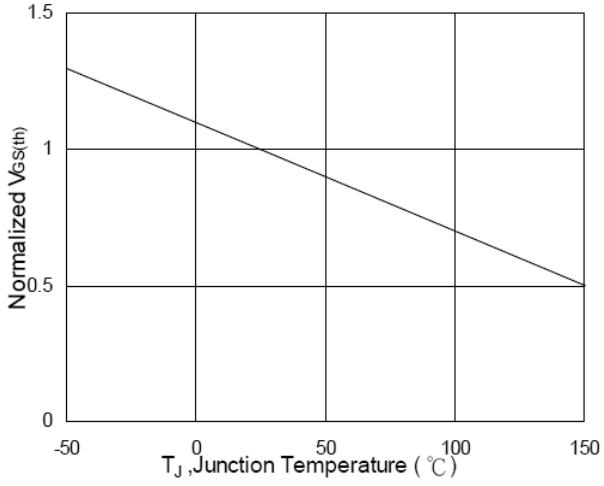


Fig.5 Normalized $V_{GS(th)}$ vs. T_J

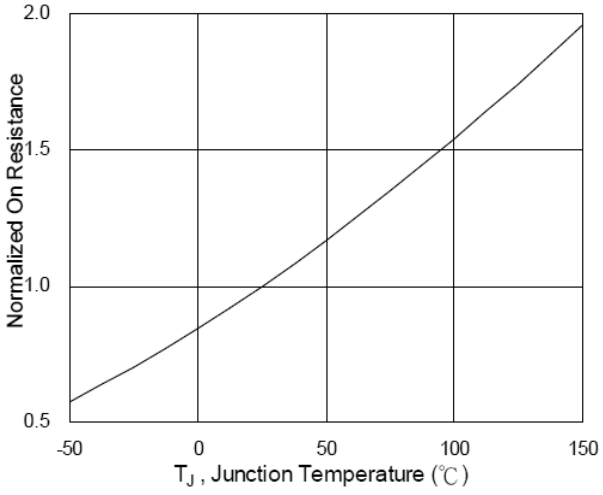


Fig.6 Normalized R_{DSON} vs. T_J

CHARACTERISTIC CURVES

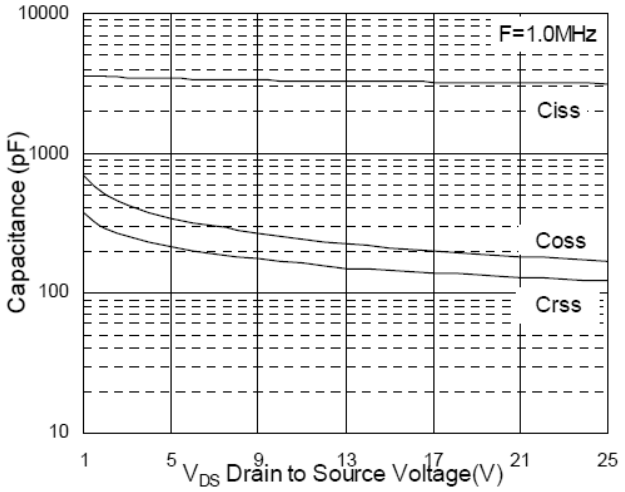


Fig.7 Capacitance

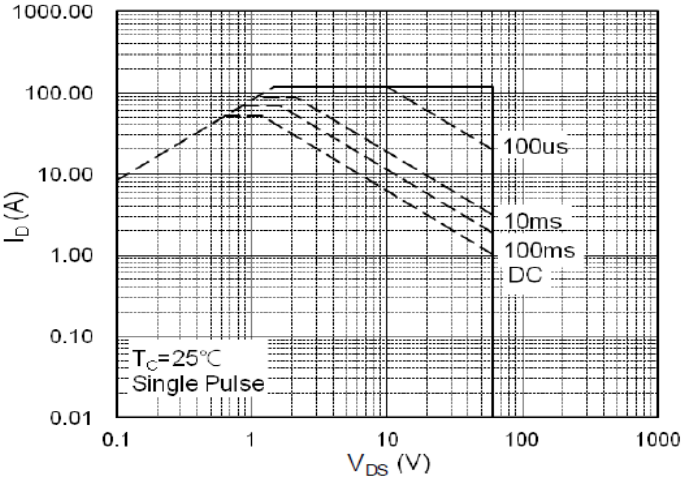


Fig.8 Safe Operating Area

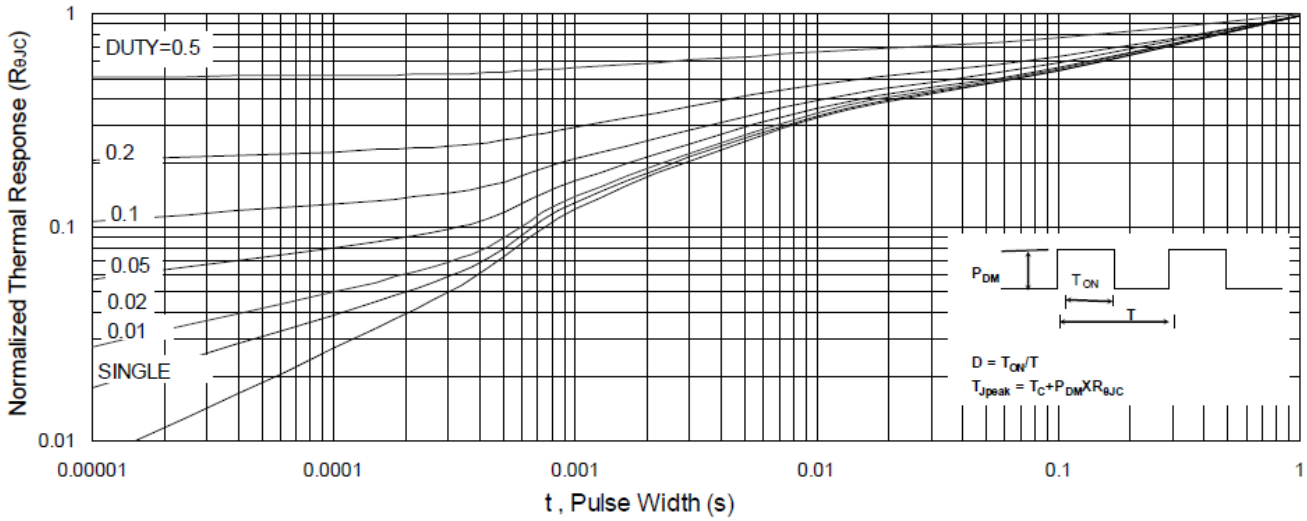


Fig.9 Normalized Maximum Transient Thermal Impedance

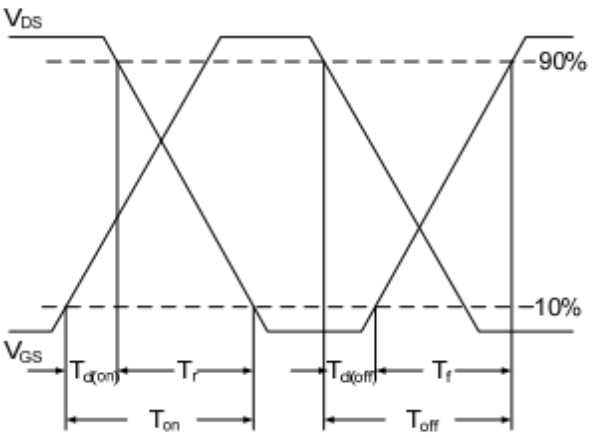


Fig.10 Switching Time Waveform

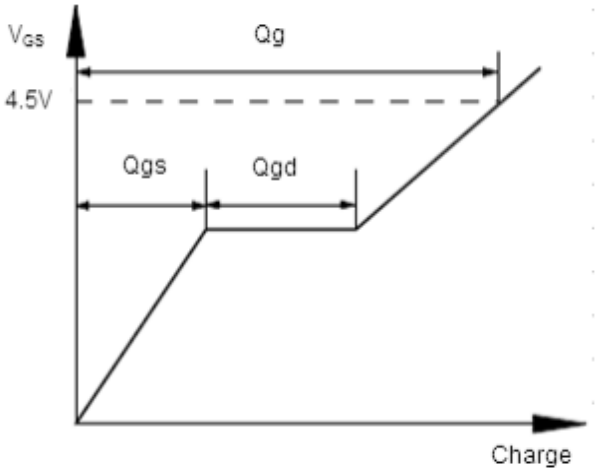
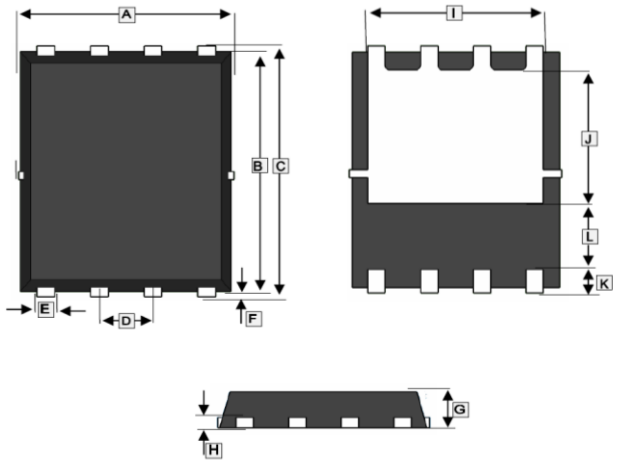


Fig.11 Gate Charge Waveform

PACKAGE OUTLINE DIMENSIONS

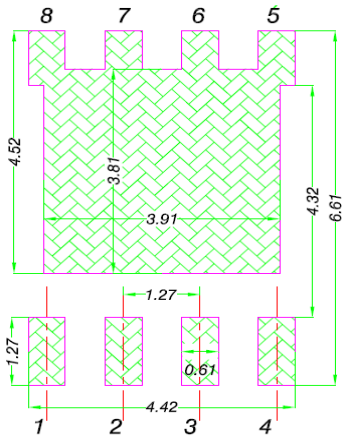
PR-8PP



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

MOUNTING PAD LAYOUT

PR-8PP



*Dimensions in millimeters