Elektronische Bauelemente

SPR50P03-C

-50A, -30V, $R_{DS(ON)}$ 10mΩ
P-Channel Enhancement Mode Power MOSFET

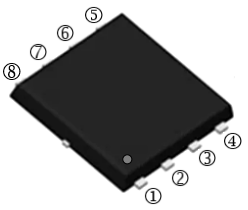
RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SPR50P03-C is the highest performance trench P-ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SPR50P03-C meet the RoHS and Green Product requirement, 100% E_{AS} guaranteed with full function reliability approved.

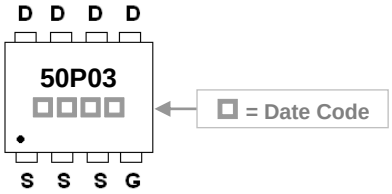
PR-8PP

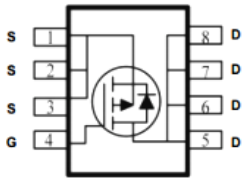


FEATURES

- Lower Gate Charge
- Advanced High Cell Density Trench Technology
- 100% E_{AS} Guaranteed
- Green Device Available

MARKING





PACKAGE INFORMATION

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

ORDER INFORMATION

Part Number	Type
SPR50P03-C	Lead (Pb)-free and Halogen-free

ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-30	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=100°C		-32	
	T_A=25°C		-11	
	T_A=70°C		-8.8	
Pulsed Drain Current [2]		I_{DM}	-120	A
Single Pulse Avalanche Energy [3]		E_{AS}	128	mJ
Avalanche Current		I_{AS}	-16	A
Total Power Dissipation	T_C=25°C	P_D	48	W
	T_A=25°C		2	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Rating				
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	2.6	°C/W
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62.5	

ELECTRICAL CHARACTERISTICS (T_J=25°C unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	-30	-	-	V	V_{GS}=0, I_D= -250uA
Gate-Threshold Voltage		$V_{GS(th)}$	-1	-	-2.5	V	V_{DS}=V_{GS}, I_D= -250uA
Forward Transfer conductance		g_{fs}	-	26.4	-	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}= -24V, V_{GS}=0
	T_J=55°C		-	-	-5		
Static Drain-Source On-Resistance [4]		$R_{DS(ON)}$	-	-	10	mΩ	V_{GS}= -10V, I_D= -30A
			-	-	18		V_{GS}= -4.5V, I_D= -15A
Total Gate Charge		Q_g	-	33	-	nC	I_D= -15A V_{DS}= -15V V_{GS}= -4.5V
Gate-Source Charge		Q_{gs}	-	10.7	-		
Gate-Drain Change		Q_{gd}	-	12.8	-		
Turn-on Delay Time		$T_{d(on)}$	-	8	-	nS	V_{DD}= -15V I_D= -15A V_{GS}= -10V R_G=3.3Ω
Rise Time		T_r	-	17.8	-		
Turn-off Delay Time		$T_{d(off)}$	-	78.4	-		
Fall Time		T_f	-	43.6	-		
Input Capacitance		C_{iss}	-	3448	-	pF	V_{GS}=0 V_{DS}= -15V f=1MHz
Output Capacitance		C_{oss}	-	508	-		
Reverse Transfer Capacitance		C_{rss}	-	421	-		
Guaranteed Avalanche Characteristics							
Single Pulse Avalanche Energy [5]		E_{AS}	32	-	-	mJ	V_{DD}= -25V, L=1mH, I_{AS}= -8A
Source-Drain Diode							
Diode Forward Voltage [4]		V_{SD}	-	-	-1.2	V	I_S= -1A, V_{GS}=0, T_J=25°C
Continuous Source Current [1]		I_S	-	-	-50	A	
Pulsed Source Current [2]		I_{SM}	-	-	-120		
Reverse Recovery Time		t_{rr}	-	29	-	nS	I_F= -15A, dI/dt=100A/μs, T_J=25°C
Reverse Recovery Charge		Q_{rr}	-	15	-	nC	

Notes:
1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2oz copper.
2. Pulse width limited by maximum junction temperature, pulse width≦300us, duty cycle≦2%.
3. The E_{AS} data shows Max. rating. The test condition is V_{DD}= -25V, V_{GS}= -10V, L=1mH, I_{AS}= -16A.
4. The data tested by pulsed, pulse width≦300us, duty cycle≦2%.
5. The Min. value is 100% E_{AS} tested guarantee.

CHARACTERISTIC CURVES

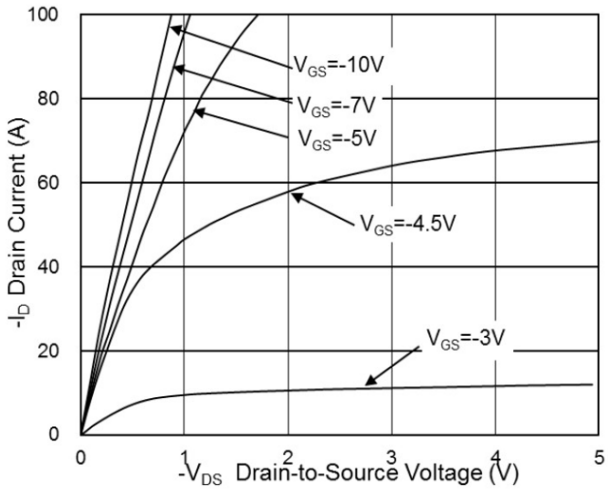


Fig.1 Typical Output Characteristics

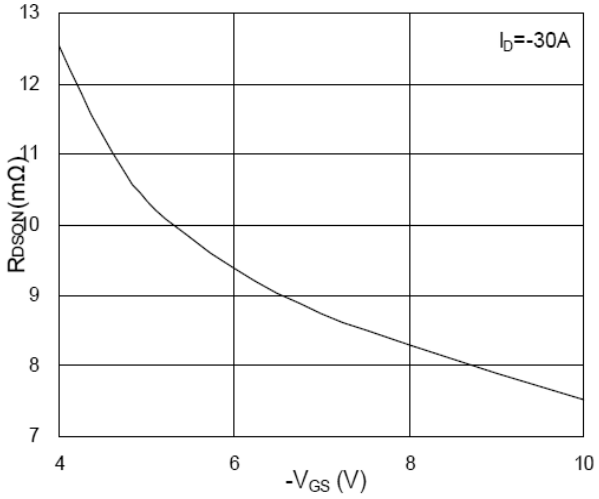


Fig.2 On-Resistance v.s Gate-Source

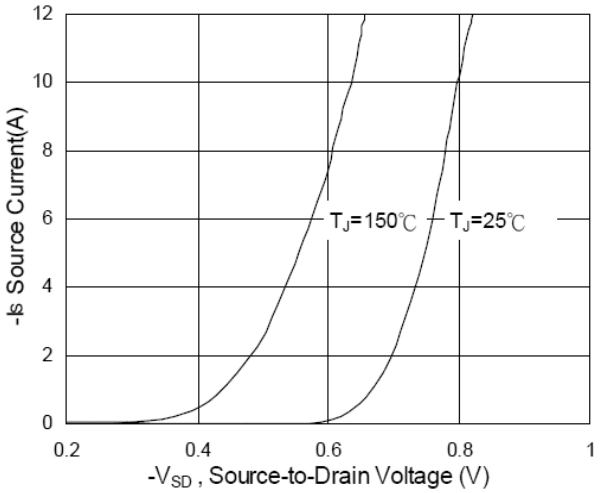


Fig.3 Forward Characteristics Of Reverse

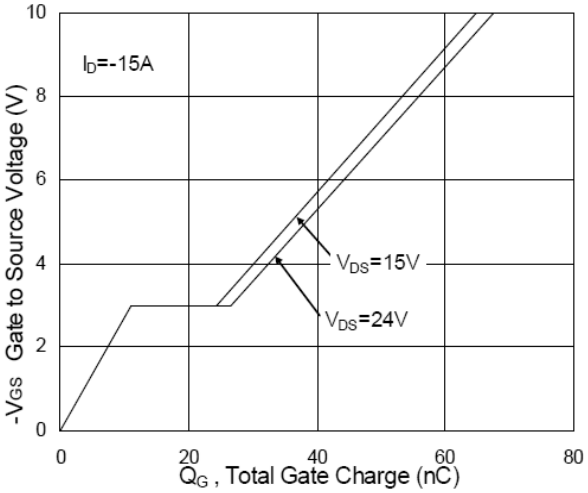


Fig.4 Gate-Charge Characteristics

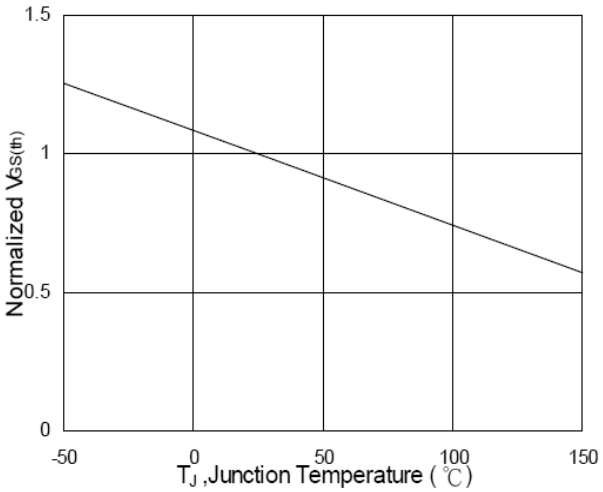


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

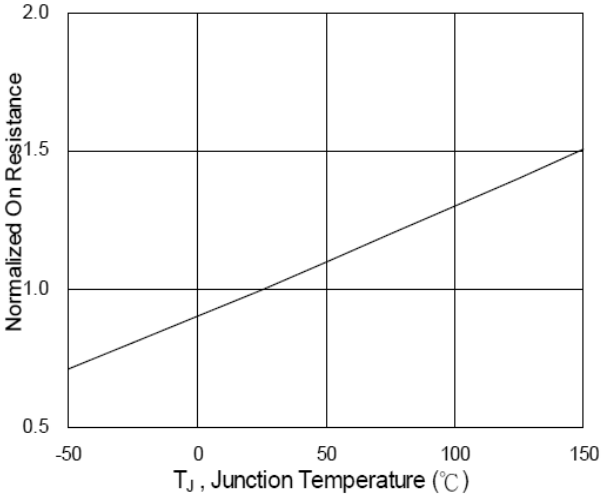


Fig.6 Normalized R_{DSON} v.s T_J

CHARACTERISTIC CURVES

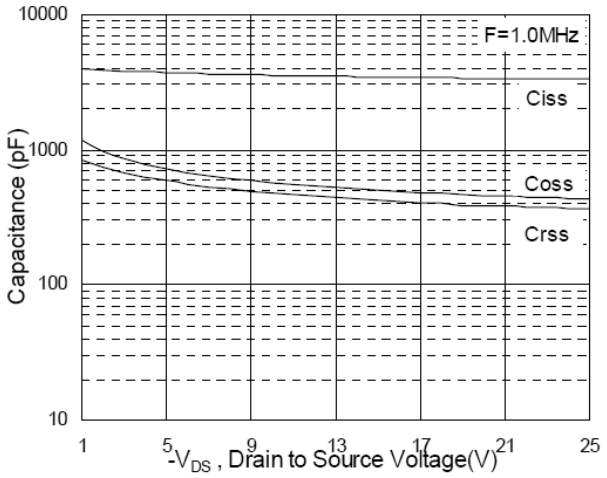


Fig.7 Capacitance

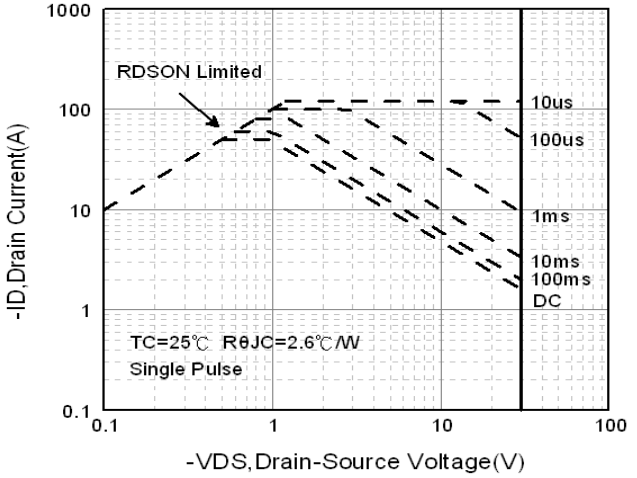


Fig.8 Safe Operating Area

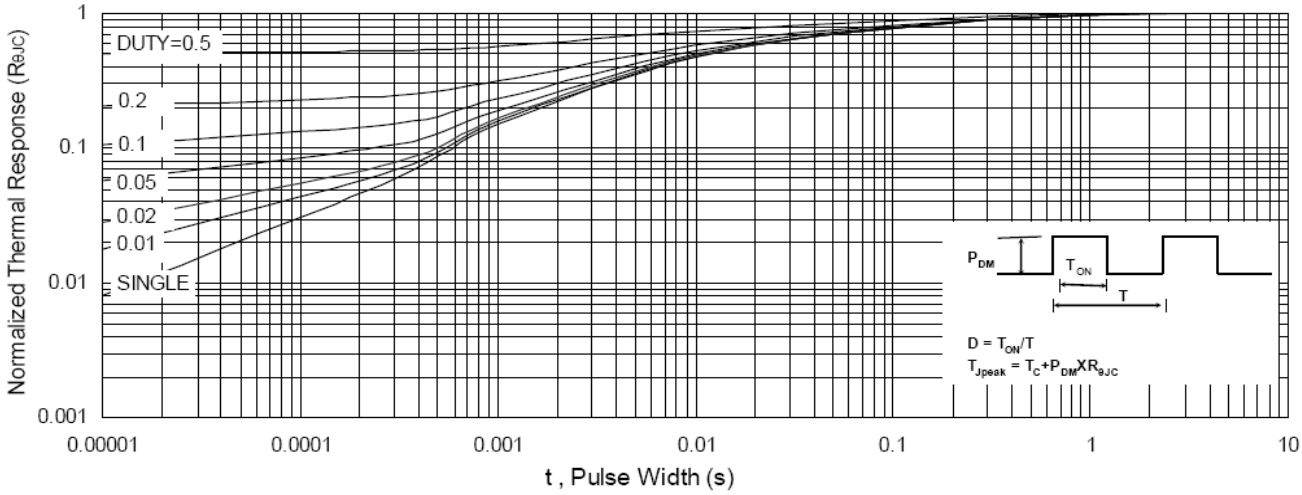


Fig.9 Normalized Maximum Transient Thermal Impedance

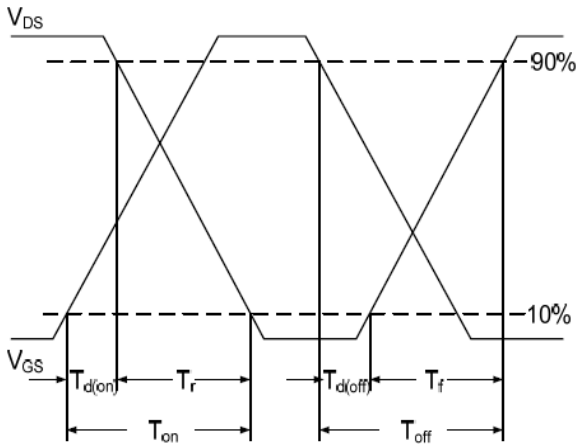


Fig.10 Switching Time Waveform

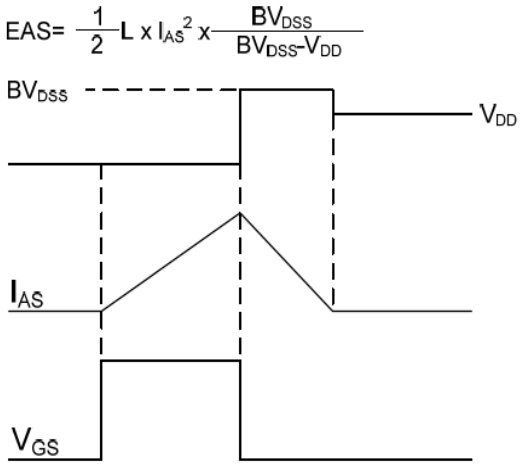
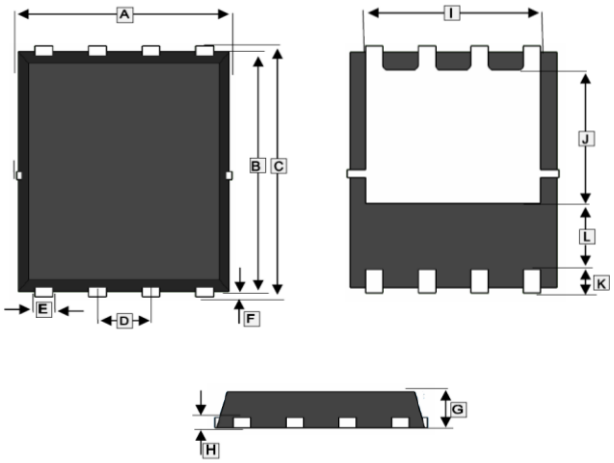


Fig.11 Unclamped Inductive Switching Waveform

PACKAGE OUTLINE DIMENSIONS

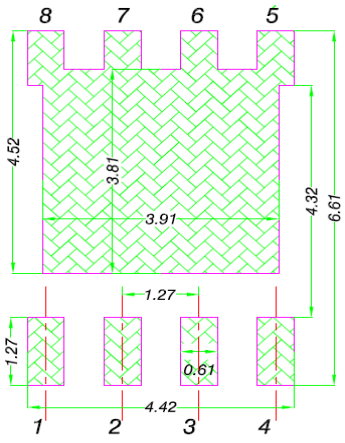
PR-8PP



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