Elektronische Bauelemente

SPR120N03S-C

120A, 30V, $R_{DS(ON)}$ 2.2mΩ

N-Channel Shielded Gate Trench Power MOSFET

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

DESCRIPTION

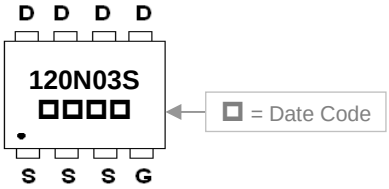
The SPR120N03S-C is the Shielded Gate Technology N-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SPR120N03S-C meet the RoHS and Green Product requirement with full function reliability approved.

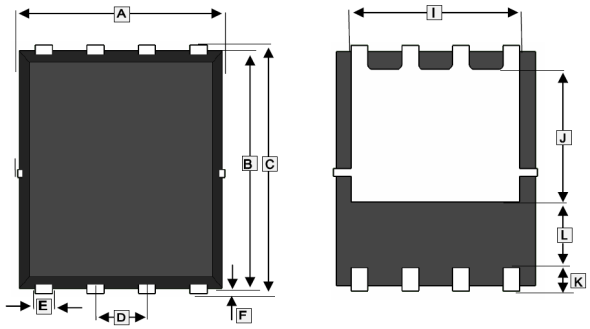
FEATURES

- Shielded Gate Trench Technology
- Lower Gate Charge
- Green Device Available

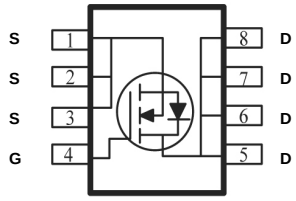
MARKING



PR-8PP



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.90	5.10	G	0.80	1.00
B	5.70	5.90	H	0.254 REF.	
C	5.95	6.20	I	4.00 REF.	
D	1.27 BSC.		J	3.40 REF.	
E	0.35	0.49	K	0.60 REF.	
F	0.10	0.20	L	1.40 REF.	



PACKAGE INFORMATION

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

ORDER INFORMATION

Part Number	Type
SPR120N03S-C	Lead (Pb)-free and Halogen-free

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

Parameter		Symbol	Ratings	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℃	I_D	120	A
	T_C=100℃		77	
Pulsed Drain Current [2 3]		I_{DM}	240	A
Power Dissipation [1]	T_C=25℃	P_D	44.6	W
Operating Junction & Storage Temperature		T_J, T_{STG}	-55~150	℃
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	50	℃/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	2.8	

ELECTRICAL CHARACTERISTICS (T_J=25℃ unless otherwise specified)

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	30	-	-	V	V_{GS}=0V, I_D=250μA
Gate-Threshold Voltage		$V_{GS(th)}$	1	-	2.5	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Source Leakage Current		I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	T_J=25℃	I_{DSS}	-	-	1	uA	V_{DS}=24V, V_{GS}=0V
	T_J=55℃		-	-	5		V_{DS}=24V, V_{GS}=0V
Static Drain-Source On-Resistance [3]		$R_{DS(ON)}$	-	1.8	2.2	mΩ	V_{GS}=10V, I_D=20A
			-	2.5	3.6		V_{GS}=4.5V, I_D=20A
Transconductance		g_{fs}	-	91	-	S	V_{DS}=5V, I_D=20A
Total Gate Charge		Q_g	-	31	-	nC	I_D=20A V_{DS}=15V V_{GS}=4.5V
Gate-Source Charge		Q_{gs}	-	12.5	-		
Gate-Drain Change		Q_{gd}	-	14.5	-		
Turn-on Delay Time		$T_{d(on)}$	-	12	-	nS	V_{DD}=15V I_D=20A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	6	-		
Turn-off Delay Time		$T_{d(off)}$	-	38.5	-		
Fall Time		T_f	-	11.5	-		
Input Capacitance		C_{iss}	-	3032	-	pF	V_{GS}=0V V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	1588	-		
Reverse Transfer Capacitance		C_{rss}	-	207	-		
Source-Drain Diode							
Diode Forward Voltage [3]		V_{SD}	-	-	1.2	V	I_S=1A, V_{GS}=0V
Continuous Source Current [1]		I_S	-	-	120	A	
Pulsed Source Current [2 3]		I_{SM}	-	-	240	A	

Notes:
1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper.
2. The power dissipation is limited by 150℃, junct ion temperature.
3. The data tested by pulsed, Pulse Width≦300μs, Duty Cycle≦2%.

CHARACTERISTIC CURVES

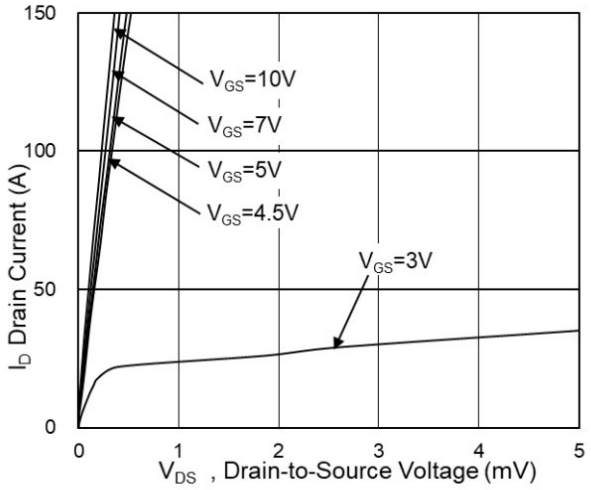


Fig.1 Typical Output Characteristics

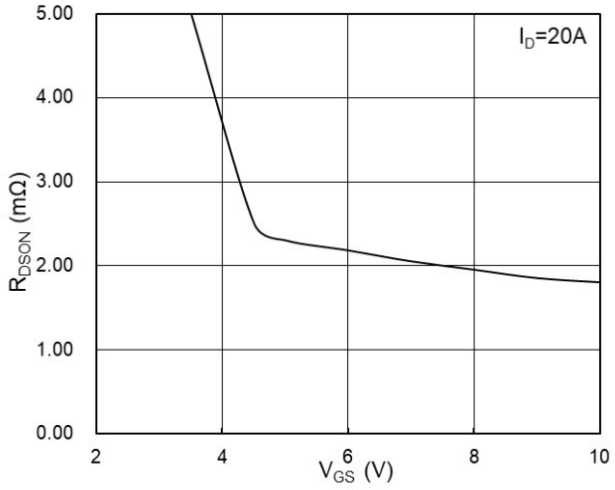


Fig.2 On-Resistance vs G-S Voltage

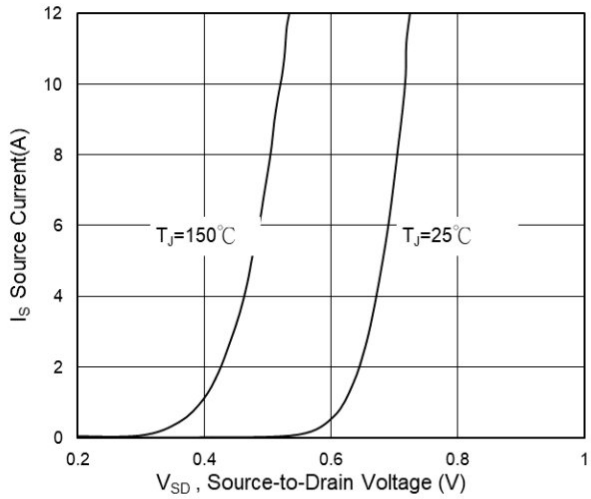


Fig.3 Source Drain Forward Characteristics

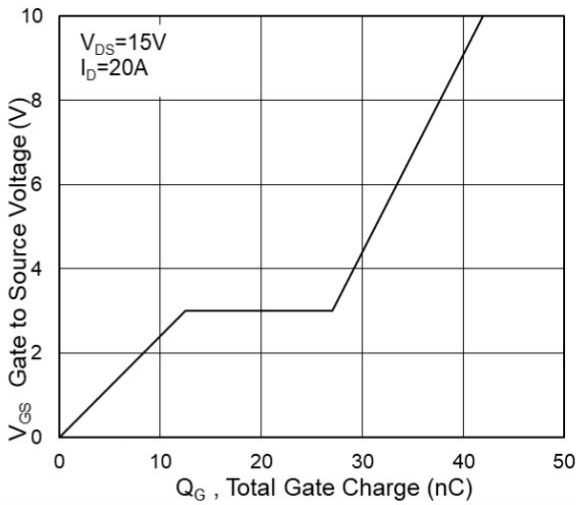


Fig.4 Gate-Charge Characteristics

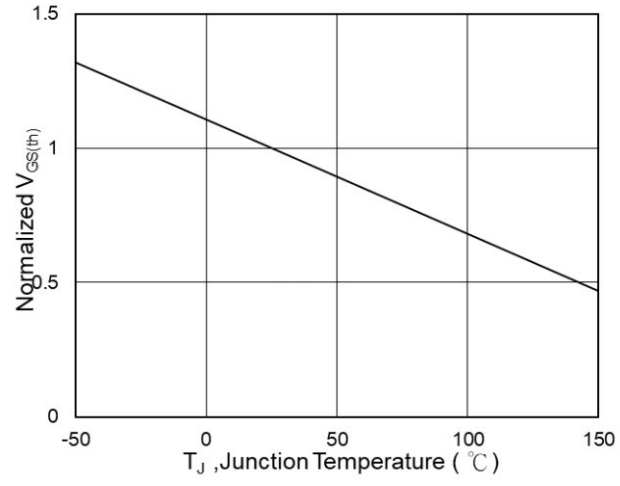


Fig.5 Normalized $V_{GS(th)}$ vs T_J

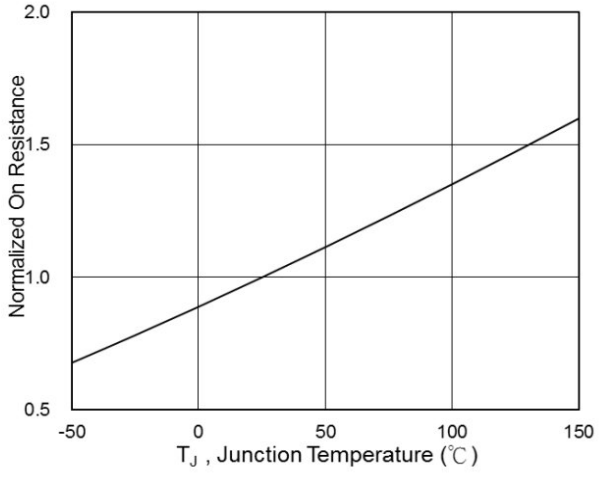


Fig.6 Normalized R_{DSON} vs T_J

CHARACTERISTIC CURVES

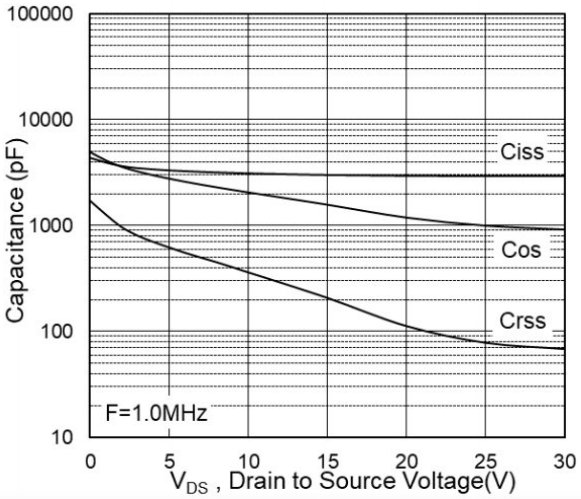


Fig.7 Capacitance

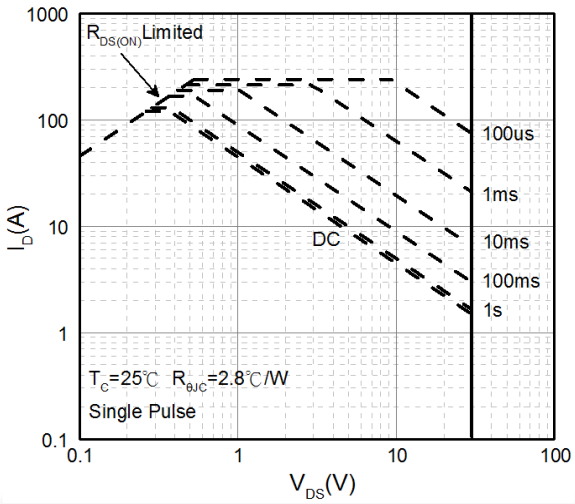


Fig.8 Safe Operating Area

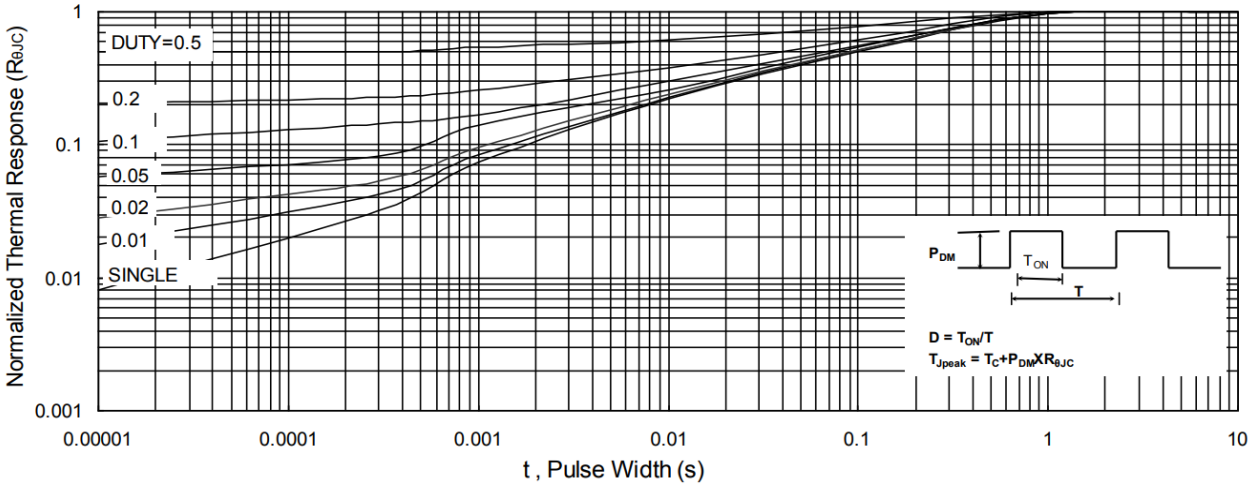


Fig.9 Normalized Maximum Transient Thermal Impedance

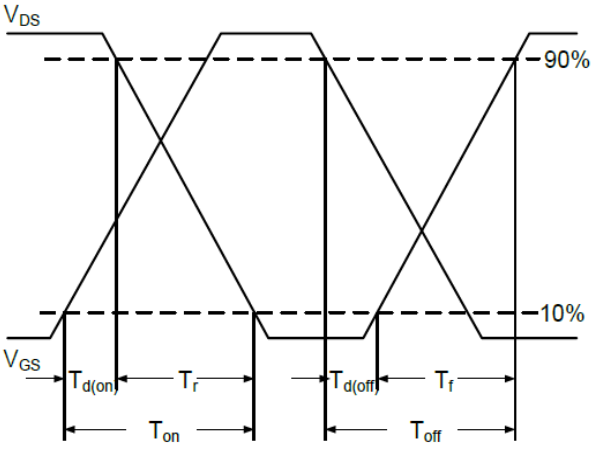


Fig.10 Switching Time Waveform

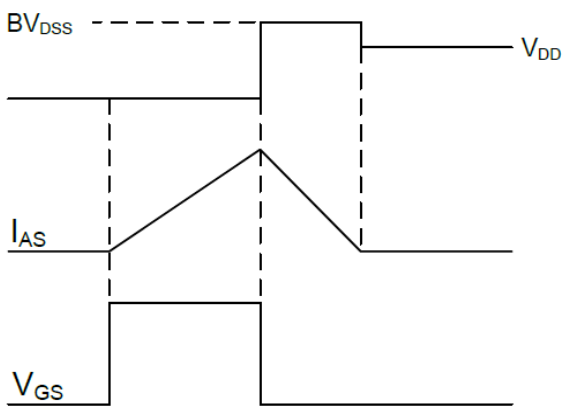


Fig.11 Unclamped Inductive Waveform