Elektronische Bauelemente

SPR52N45S-C

52A, 45V, $R_{DS(ON)}$ 9.5mΩ

N-Channel Enhancement Mode Power MOSFET

RoHS Compliant Product

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

DESCRIPTION

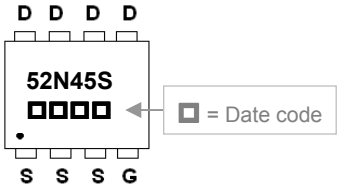
The SPR52N45S-C is the highest performance trench N-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SPR52N45S-C meet the RoHS and Green Product requirement with full function reliability approved.

FEATURES

- Lower Gate Charge
- Advanced high cell density Trench technology
- Green Device Available

MARKING



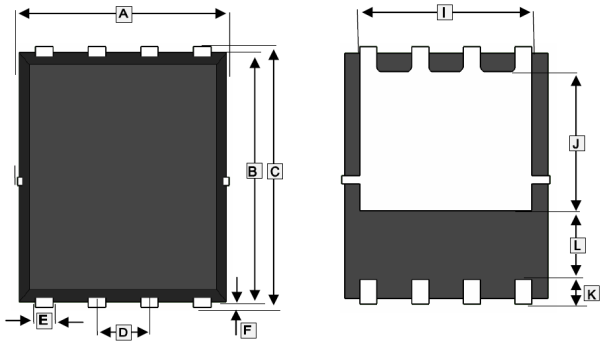
PACKAGE INFORMATION

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

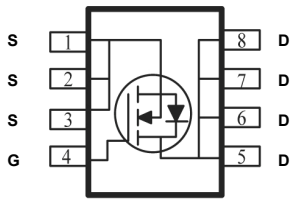
ORDER INFORMATION

Part Number	Type
SPR52N45S-C	Lead (Pb)-free and Halogen-free

PR-8PP



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.	



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

Parameter		Symbol	Ratings	Unit
Drain-Source Voltage		V_{DS}	45	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] (Silicon Limited)	T_C=25°C	I_D	52	A
	T_C=100°C		33	
Continuous Drain Current [1] (Package Limited)	T_C=25°C		30	
Pulsed Drain Current [2,4]		I_{DM}	120	A
Power Dissipation	T_C=25°C	P_D	50	W
Operating Junction & Storage Temperature		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	55	°C/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	2.5	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV_{DSS}	45	-	-	V	V_{GS}=0, I_D=250μA
Gate-Threshold Voltage	$V_{GS(th)}$	1	-	2.2	V	V_{DS}=V_{GS}, I_D=250μA
Gate-Source Leakage Current	I_{GSS}	-	-	±100	nA	V_{GS}= ±20V
Drain-Source Leakage Current	I_{DSS}	-	-	1	uA	V_{DS}=36V, V_{GS}=0, T_J=25°C
		-	-	100		V_{DS}=36V, V_{GS}=0, T_J=100°C
Static Drain-Source On-Resistance [3]	$R_{DS(ON)}$	-	6.7	9.5	mΩ	V_{GS}=10V, I_D=20A
		-	9.3	14		V_{GS}=4.5V, I_D=10A
Transconductance	g_{fs}	-	25	-	S	V_{DS}=5V, I_D=20A
Gate Resistance	R_g	-	1.5	-	Ω	V_{DS}=V_{GS}=0, f =1.0MHz
Total Gate Charge (4.5V)	Q_g	-	7	-	nC	I_D=10A V_{DD}=20V V_{GS}=10V
Total Gate Charge			14.5			
Gate-Source Charge	Q_{gs}	-	2	-		
Gate-Drain Change	Q_{gd}	-	2.5	-		
Turn-on Delay Time	$T_{d(on)}$	-	6	-	nS	V_{DD}=50V I_D=8A V_{GS}=10V R_G=10Ω
Rise Time	T_r	-	5	-		
Turn-off Delay Time	$T_{d(off)}$	-	21	-		
Fall Time	T_f	-	5	-		
Input Capacitance	C_{iss}	-	942	-	pF	V_{GS} =0 V_{DS}=20V f =1.0MHz
Output Capacitance	C_{oss}	-	309	-		
Reverse Transfer Capacitance	C_{rss}	-	29	-		
Source-Drain Diode						
Diode Forward Voltage [3]	V_{SD}	-	-	1.2	V	I_S=20A, V_{GS}=0
Reverse Recovery Time	T_{rr}	-	24	-	nS	I_F=20A,V_R=20V,dI/dt=200A/μs
Reverse Recovery Charge	Q_{rr}	-	19	-	nC	

Notes:
1. The data tested by surface mounted on a 1 inch2 FR-4 board with 2OZ copper.
2. The Pulse width limited by maximum junction temperature, Pulse Width ≤10μs, Duty Cycle≤2%
3. The Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%
4. Package limit.

CHARACTERISTIC CURVES

Fig 1. Typical Output Characteristics

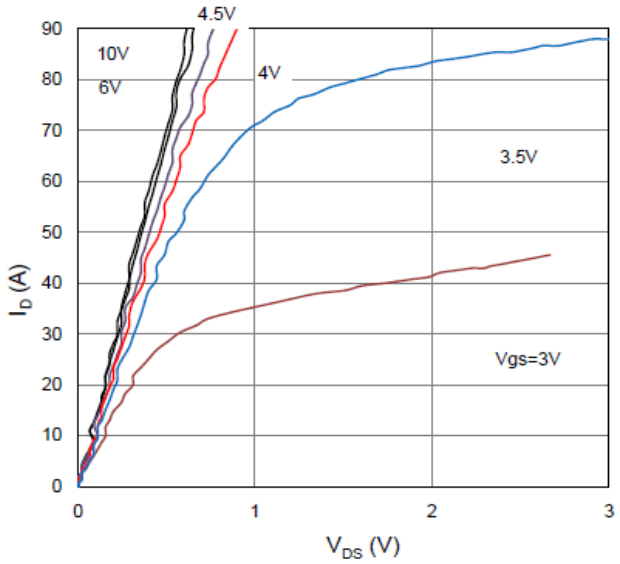


Figure 2. On-Resistance vs. Gate-Source Voltage

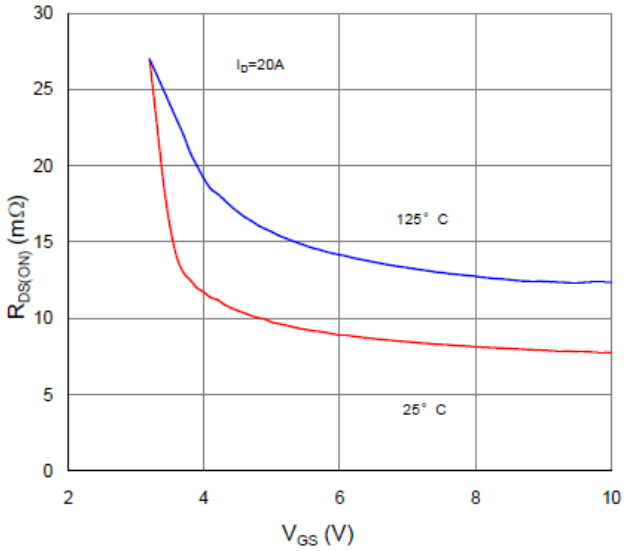


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

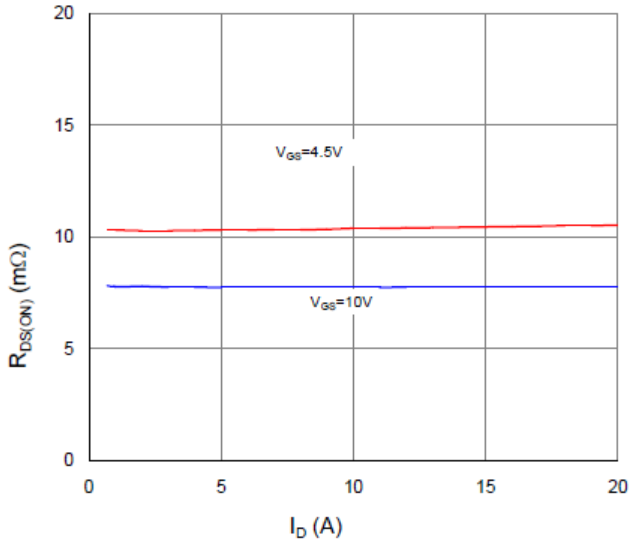


Figure 4. Normalized On-Resistance vs. Junction Temperature

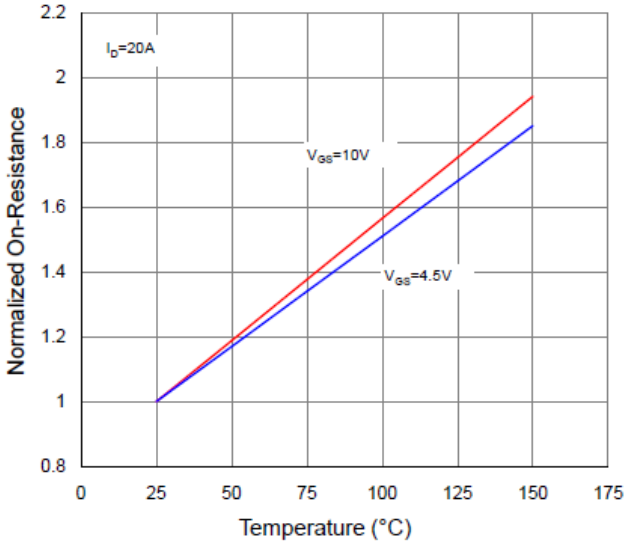


Figure 5. Typical Transfer Characteristics

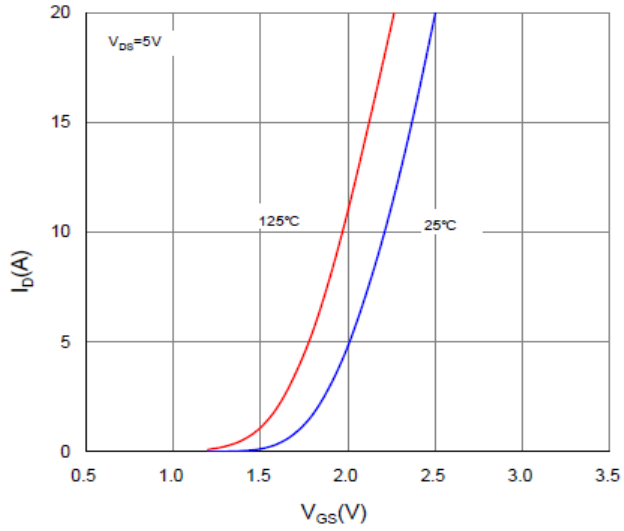
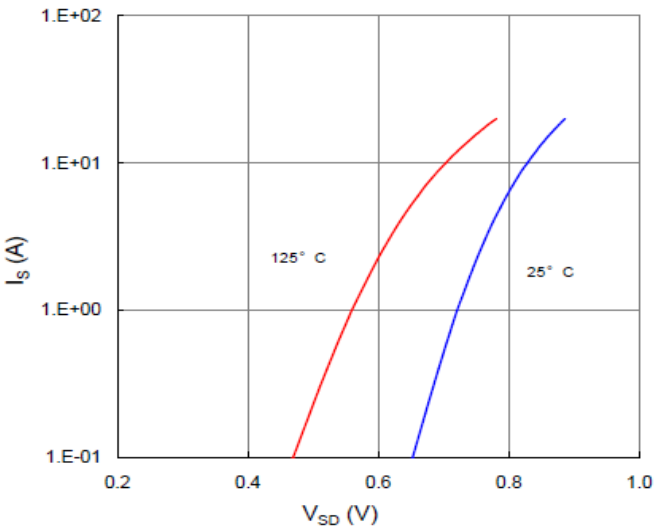


Figure 6. Typical Source-Drain Diode Forward Voltage



CHARACTERISTIC CURVES

Figure 7. Typical Gate-Charge vs. Gate-to-Source Voltage

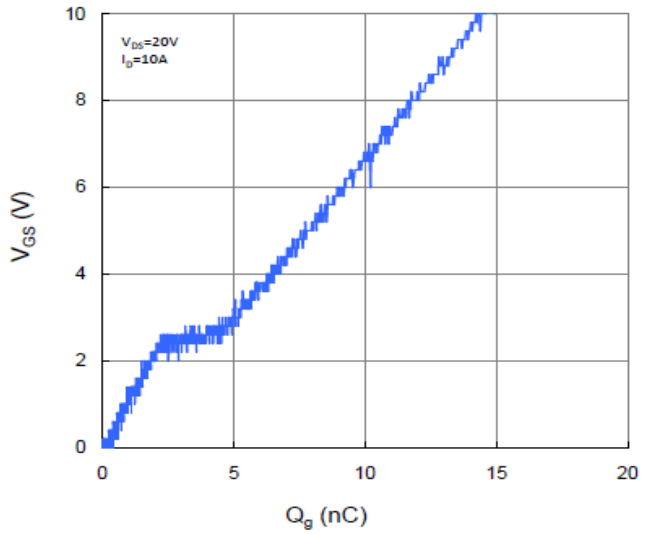


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

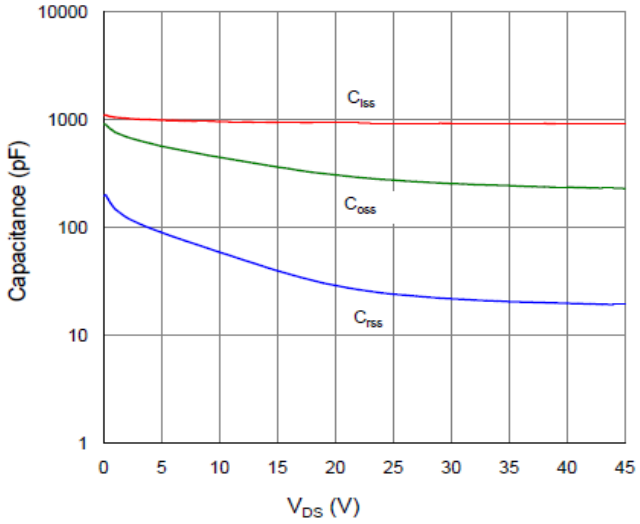


Figure 9. Maximum Safe Operating Area

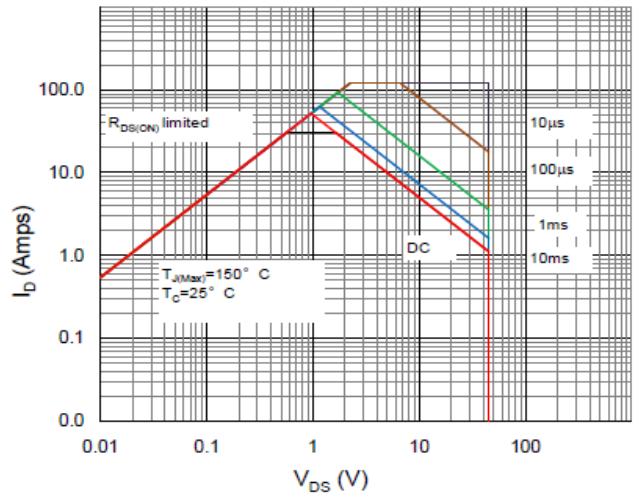


Figure 10. Maximun Drain Current vs. Case Temperature

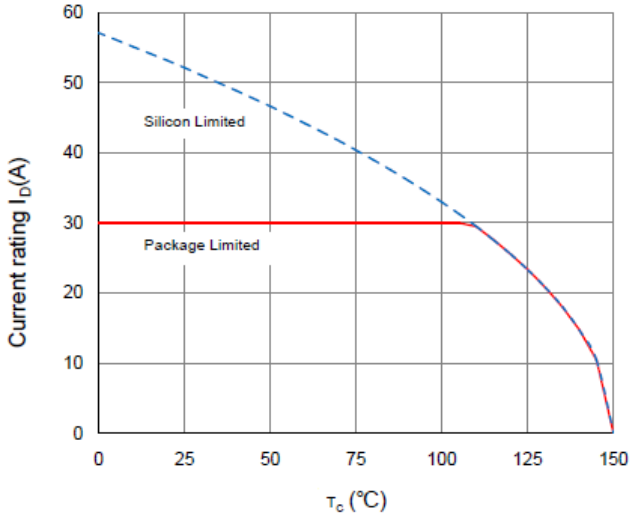


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case