Elektronische Bauelemente

SPR45N10-C

45A, 100V, $R_{DS(ON)}$ 22mΩ

N-Channel Enhancement Mode Power MOSFET

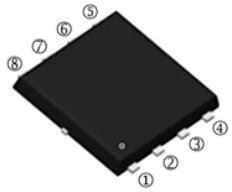
RoHS Compliant Product
A suffix of "-C" specifies halogen & lead-free

DESCRIPTION

The SPR45N10-C is the highest performance trench N-ch MOSFETs with extreme high cell density, which provide excellent R_{DSON} and gate charge for most of the synchronous buck converter applications.

The SPR45N10-C meet the RoHS and Green Product requirement,100% E_{AS} guaranteed with full function reliability approved.

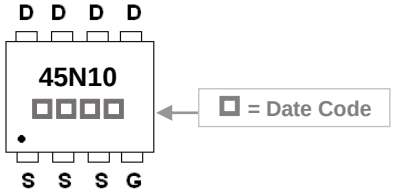
PR-8PP

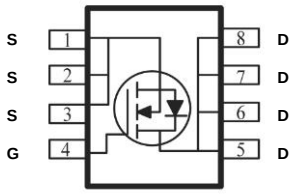


FEATURES

- Advanced High Cell Density Trench Technology
- Excellent CdV/dt Effect Decline
- Green Device Available
- Super Low Gate Charge
- 100% E_{AS} Guaranteed

MARKING





PACKAGE INFORMATION

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

ORDER INFORMATION

Part Number	Type
SPR45N10-C	Lead (Pb)-free and Halogen-free

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

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current [1] @V_{GS}=10V	T_C=25°C	I_D	45	A
	T_C=100°C		28	
	T_A=25°C		6.6	
	T_A=70°C		5.3	
Pulsed Drain Current [2]	T_C=25°C	I_{DM}	100	A
Single Pulse Avalanche Energy [3]		E_{AS}	98	mJ
Avalanche Current		I_{AS}	41	A
Total Power Dissipation [4]	T_C=25°C	P_D	90	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Data				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	t≦ 10sec, 36	°C/W
			Steady State, 125	
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	1.4	

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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage		BV_{DSS}	100	-	-	V	V_{GS}=0, I_D= 250μA
Gate-Threshold Voltage		$V_{GS(th)}$	2	-	4.5	V	V_{DS}=V_{GS}, I_D=250μA
Forward Transfer conductance		g_{fs}	-	27	-	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	μA	V_{DS}=80V, V_{GS}=0
	T_J=55°C		-	-	5		
Static Drain-Source On-Resistance [2]		$R_{DS(ON)}$	-	16.5	22	mΩ	V_{GS}=10V, I_D=30A
			-	20	30		V_{GS}=7V, I_D=15A
Gate Resistance		R_g	-	1.9	-	Ω	f=1MHz
Total Gate Charge		Q_g	-	34.3	-	nC	I_D=30A V_{DS}=80V V_{GS}=10V
Gate-Source Charge		Q_{gs}	-	14.8	-		
Gate-Drain (“Miller”) Change		Q_{gd}	-	11.5	-		
Turn-on Delay Time [2]		$T_{d(on)}$	-	15.4	-	nS	V_{DD}=50V I_D=30A V_{GS}=10V R_G=3.3Ω
Rise Time		T_r	-	83	-		
Turn-off Delay Time		$T_{d(off)}$	-	18	-		
Fall Time		T_f	-	33.3	-		
Input Capacitance		C_{iss}	-	2078	-	pF	V_{GS} =0 V_{DS}=15V f=1MHz
Output Capacitance		C_{oss}	-	285	-		
Reverse Transfer Capacitance		C_{rss}	-	94	-		
Single Pulse Avalanche Energy [5]		E_{AS}	53	-	-	mJ	V_{DD}=25V, L=0.1mH, I_{AS}=30A
Source-Drain Diode							
Diode Forward Voltage [2]		V_{SD}	-	-	1	V	I_S=1A, V_{GS}=0V
Continuous Source Current [1 6]		I_S	-	-	45	A	V_G=V_D=0, Force Current
Pulsed Source Current [2 6]		I_{SM}	-	-	100	A	
Reverse Recovery Time		t_{rr}	-	34	-	nS	I_F=30A, dI/dt=100A/μs, T_J=25°C
Reverse Recovery Charge		Q_{rr}	-	47	-	nC	

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≦ 300us, duty cycle≦ 2%.
3. The E_{AS} data shows Max. rating. The test condition is V_{DD}=25V, V_{GS}=10V, L=0.1mH, I_{AS}=41A.
4. The power dissipation is limited by 150°C junction temperature.
5. The Min. value is 100% E_{AS} tested guarantee.
6. The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation.

CHARACTERISTIC CURVES

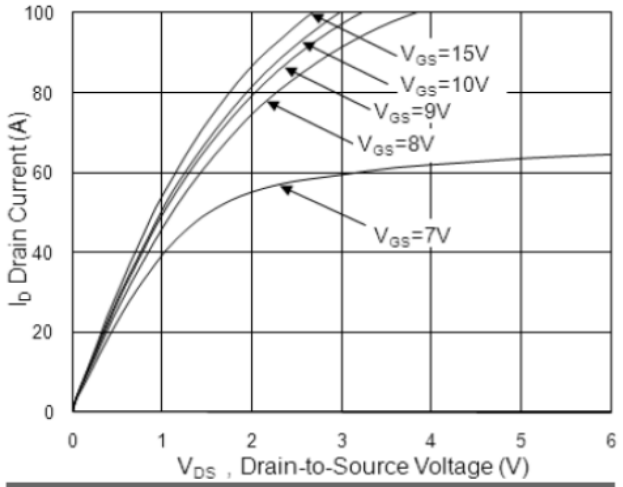


Fig.1 Typical Output Characteristics

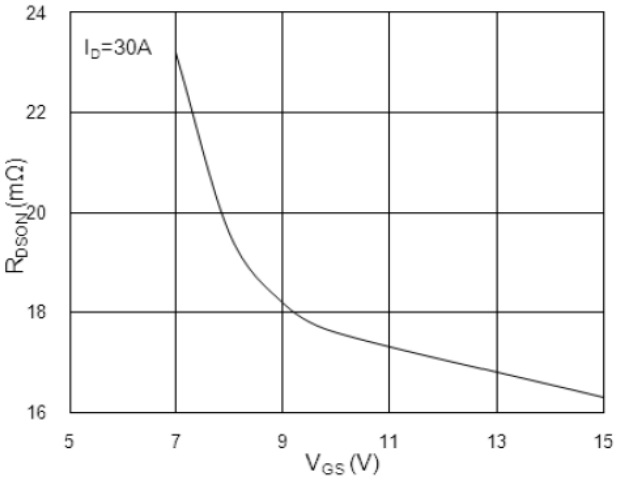


Fig.2 On-Resistance v.s Gate-Source

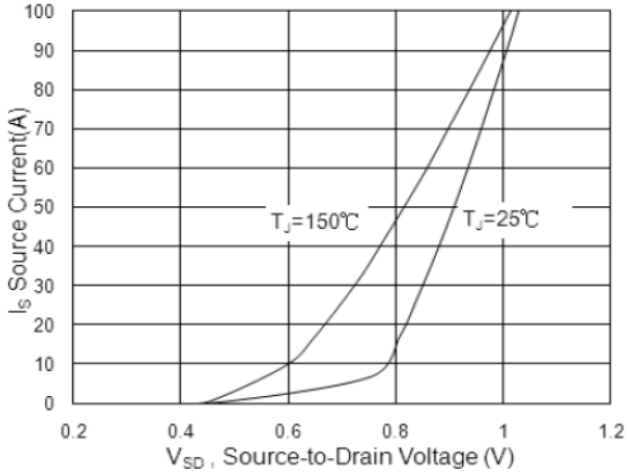


Fig.3 Forward Characteristics of Reverse

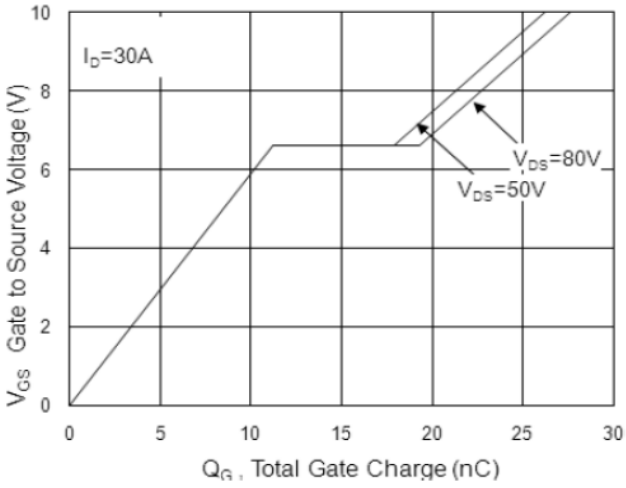


Fig.4 Gate-Charge Characteristics

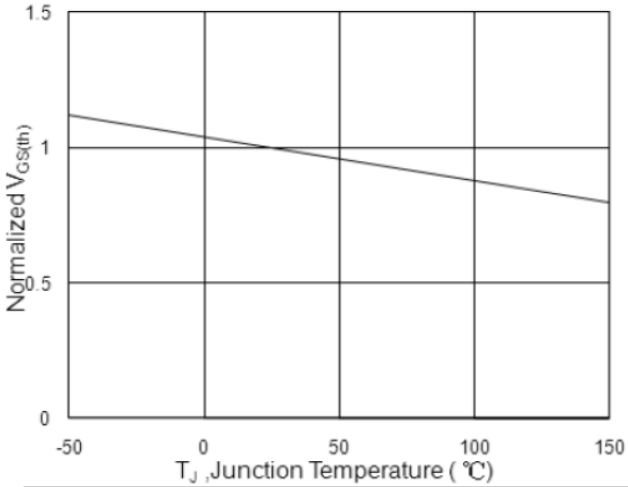


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

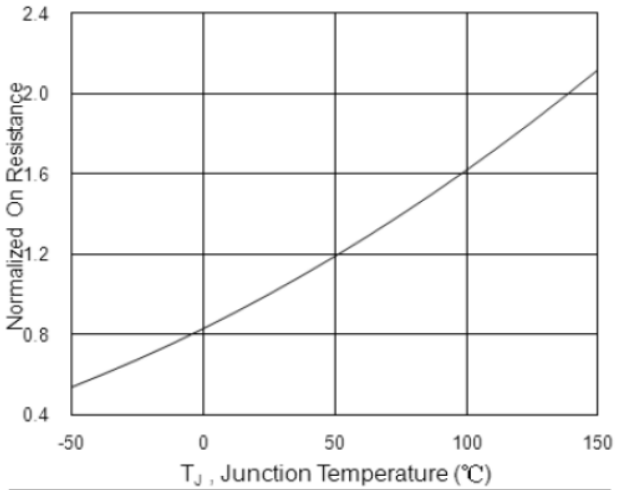


Fig.6 Normalized R_{DSON} v.s T_J

CHARACTERISTIC CURVES

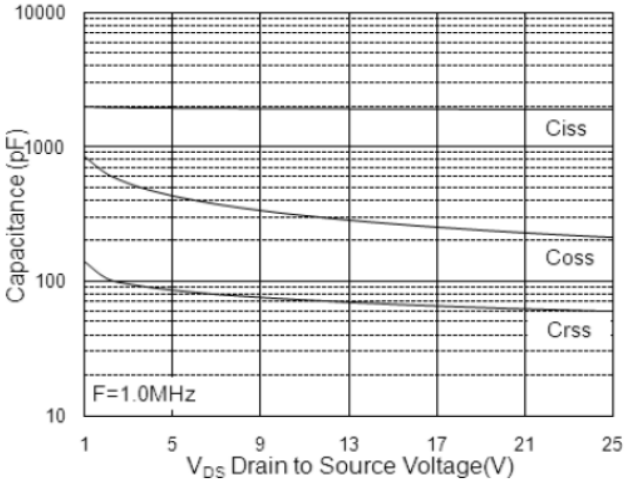


Fig.7 Capacitance

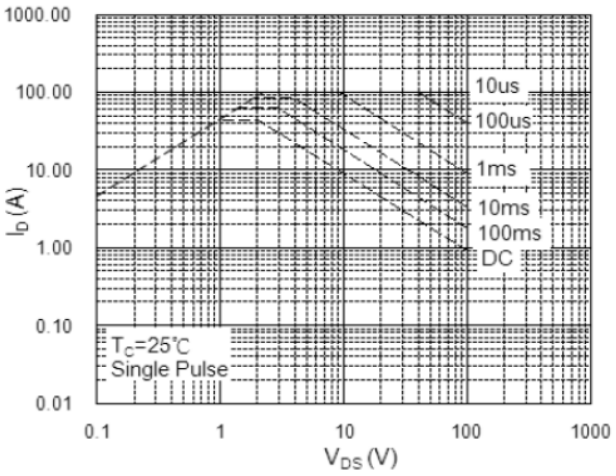


Fig.8 Safe Operating Area

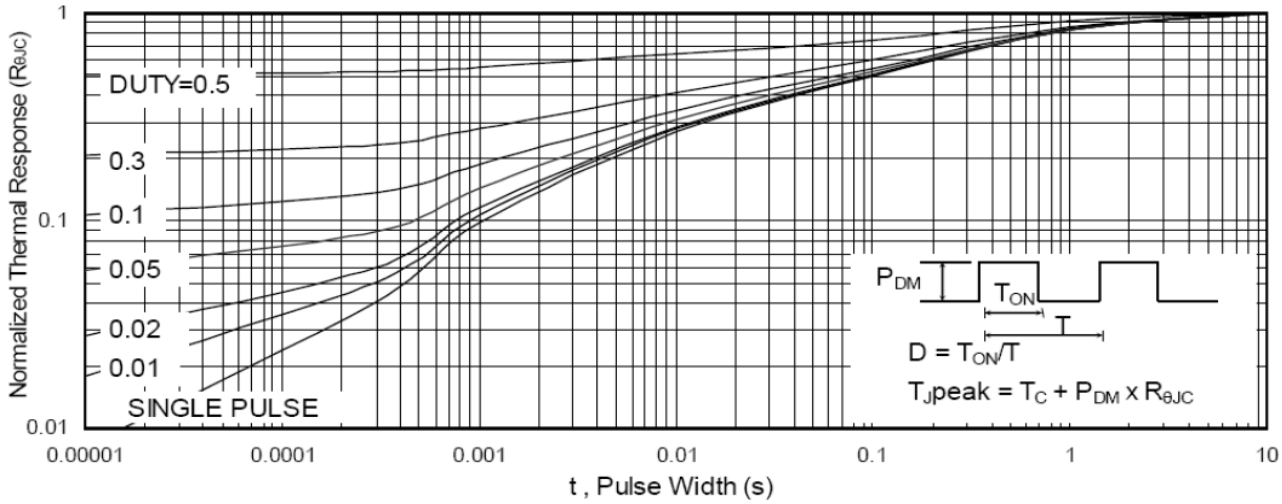


Fig.9 Normalized Maximum Transient Thermal Impedance

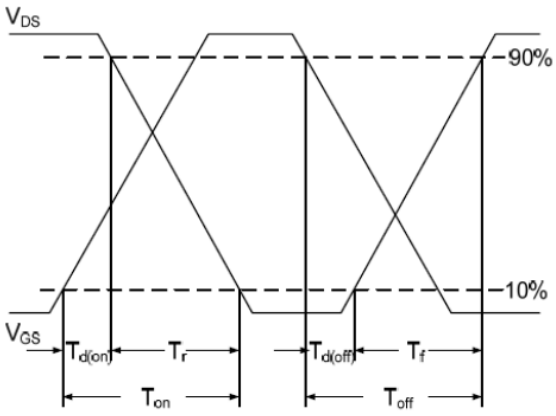


Fig.10 Switching Time Waveform

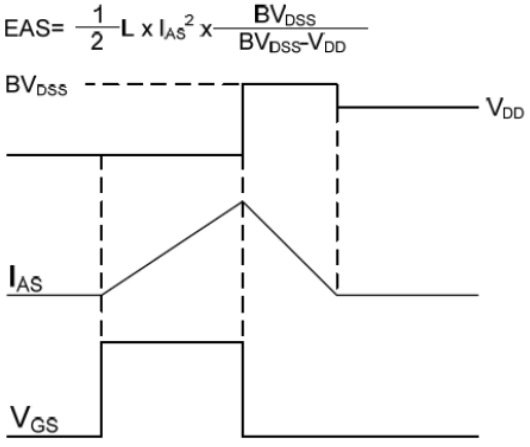
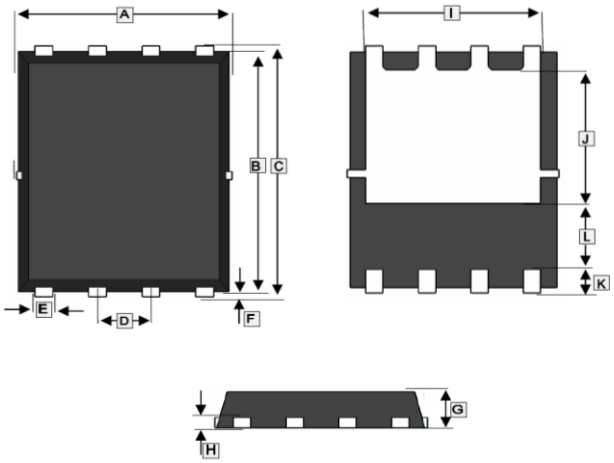


Fig.11 Unclamped Inductive Switching Waveform

PACKAGE OUTLINE DIMENSIONS

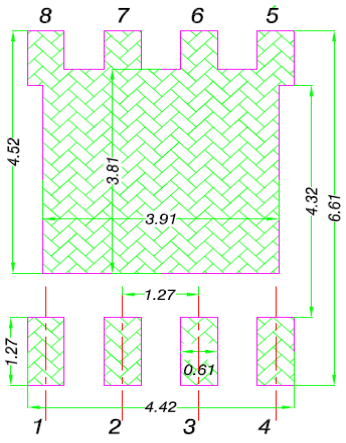
PR-8PP



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