Elektronische Bauelemente

SPR9971-C

26A, 60V, $R_{DS(ON)}$ 36mΩ

N-Channel Enhancement Mode Power MOSFET

RoHS Compliant Product

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

DESCRIPTION

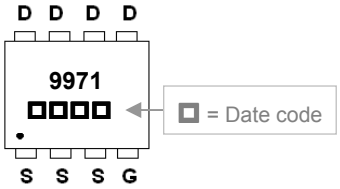
The SPR9971-C is the highest performance trench N-Ch MOSFETs with extreme high cell density, which provide excellent $R_{DS(ON)}$ and gate charge for most of the synchronous buck converter applications.

The SPR9971-C meet the RoHS and Green Product requirement with full function reliability approved.

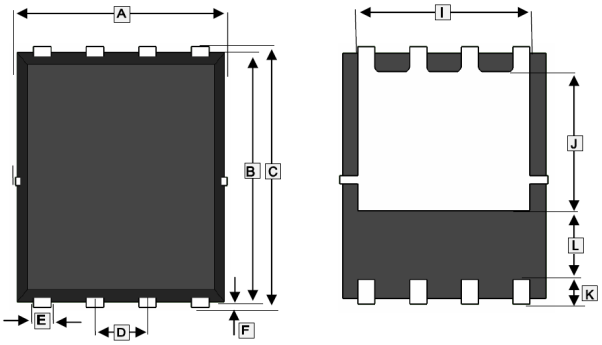
FEATURES

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

MARKING



PR-8PP



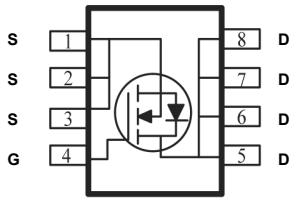
REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.9	5.1	G	0.8	1.0
B	5.7	5.9	H	0.254 Ref.	
C	5.95	6.2	I	4.0 Ref.	
D	1.27 BSC.		J	3.4 Ref.	
E	0.35	0.49	K	0.6 Ref.	
F	0.1	0.2	L	1.4 Ref.	

PACKAGE INFORMATION

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

ORDER INFORMATION

Part Number	Type
SPR9971-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	26	A
	T_C=100°C		17	
Pulsed Drain Current [2]		I_{DM}	110	A
Power Dissipation [1]	T_C=25°C	P_D	41.6	W
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55~150	°C
Thermal Resistance Ratings				
Thermal Resistance Junction-Ambient [1]		$R_{\theta JA}$	62.5	°C/W
Thermal Resistance Junction-Case [1]		$R_{\theta JC}$	3	

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	60	-	-	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	I_{DSS}	-	-	1	uA	V_{DS}=48V, V_{GS}=0V, T_J=25°C
		-	-	5		V_{DS}=48V, V_{GS}=0V, T_J=55°C
Static Drain-Source On-Resistance [3]	$R_{DS(ON)}$	-	-	36	mΩ	V_{GS}=10V, I_D=18A
		-	-	45		V_{GS}=4.5V, I_D=10A
Forward Transconductance	g_{fs}	-	10	-	S	V_{DS}=10V, I_D=18A
Total Gate Charge	Q_g	-	12.5	-	nC	I_D=18A V_{DD}=48V V_{GS}=4.5V
Gate-Source Charge	Q_{gs}	-	3.24	-		
Gate-Drain Change	Q_{gd}	-	6.31	-		
Turn-on Delay Time	$T_{d(on)}$	-	7	-	nS	V_{DD}=30V I_D=18A V_{GS}=10V R_G=3.3Ω
Rise Time	T_r	-	9	-		
Turn-off Delay Time	$T_{d(off)}$	-	23	-		
Fall Time	T_f	-	6	-		
Input Capacitance	C_{iss}	-	1345	-	pF	V_{GS}=0V V_{DS}=25V f=1MHz
Output Capacitance	C_{oss}	-	72.5	-		
Reverse Transfer Capacitance	C_{rss}	-	54.4	-		
Source-Drain Diode						
Diode Forward Voltage [3]	V_{SD}	-	-	1.2	V	I_S=25A, V_{GS}=0V
Continuous Source Current [1]	I_S	-	-	26	A	
Pulsed Source Current [2]	I_{SM}	-	-	110	A	
Reverse Recovery Time	T_{rr}	-	37	-	nS	I_F=18A, dI/dt=100A/μs, T_J=25°C
Reverse Recovery Charge	Q_{rr}	-	38	-	nC	

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°C junction temperature.
3. The Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

CHARACTERISTIC CURVES

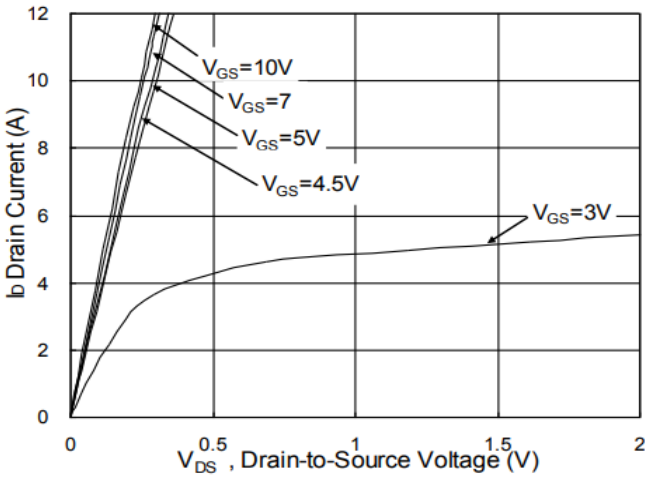


Fig.1 Typical Output Characteristics

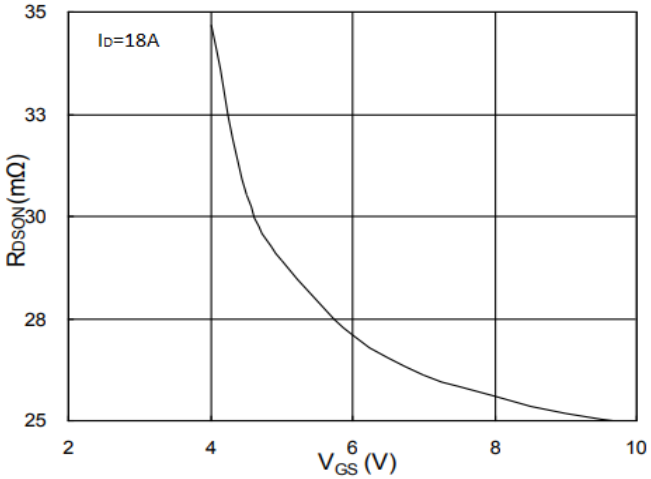


Fig.2 On-Resistance v.s Gate-Source

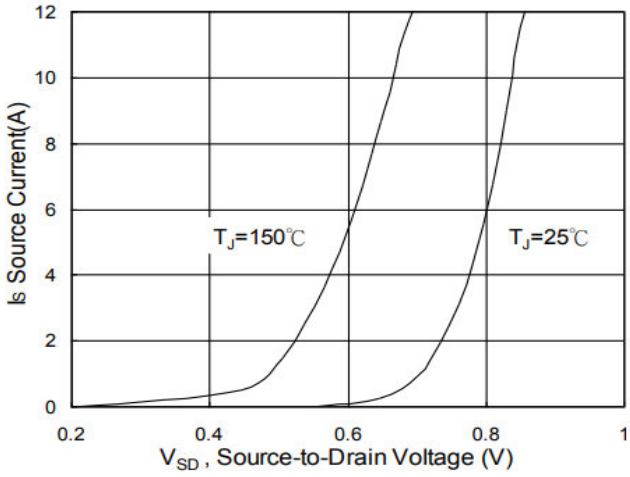


Fig.3 Forward Characteristics of Reverse

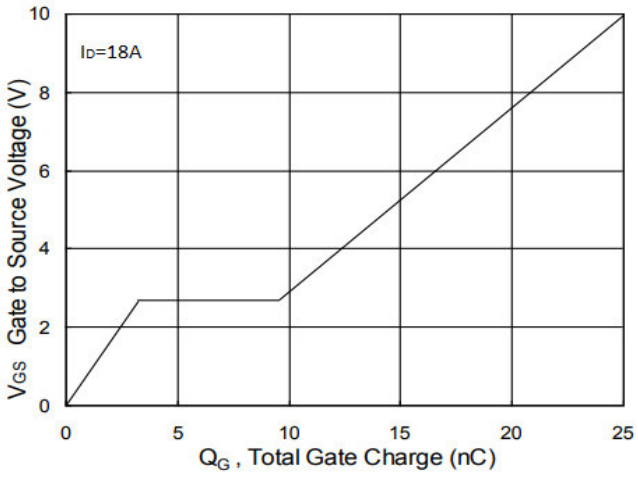


Fig.4 Gate-Charge Characteristics

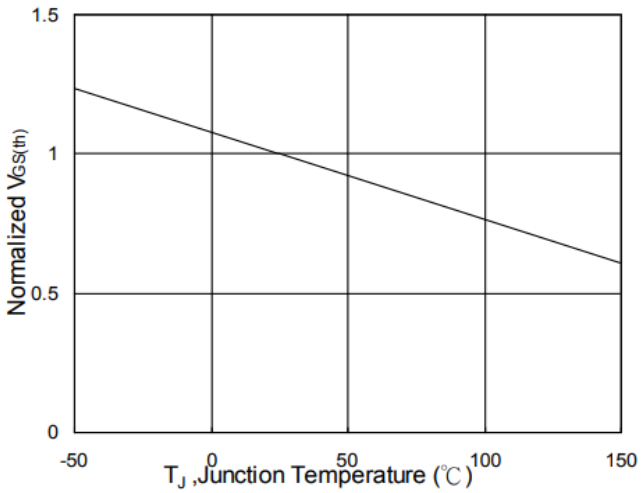


Fig.5 Normalized $V_{GS(th)}$ v.s T_J

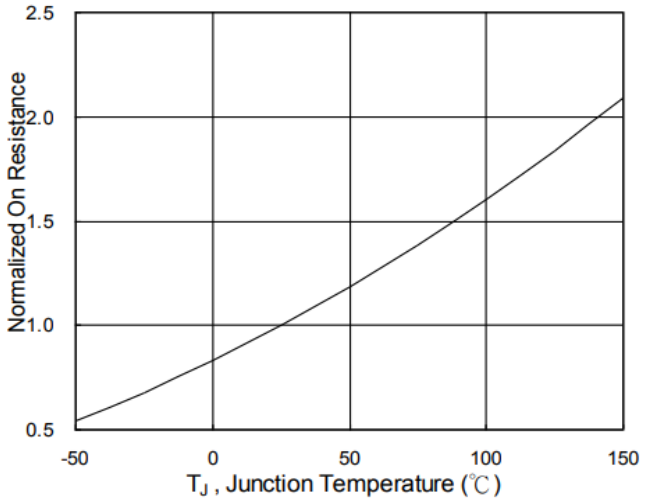


Fig.6 Normalized R_{DSON} v.s T_J

CHARACTERISTIC CURVES

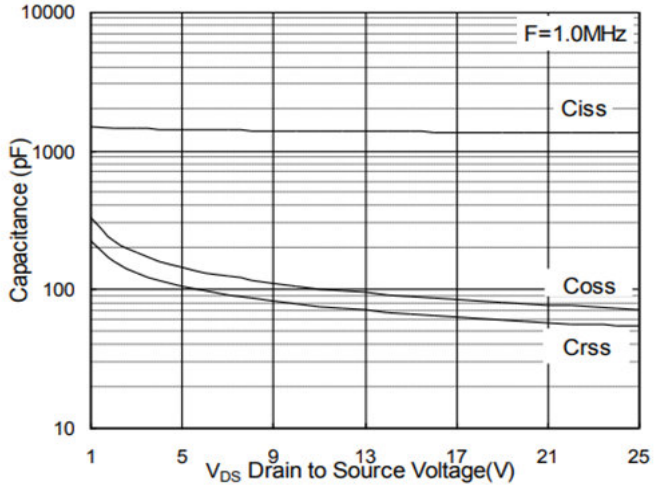


Fig.7 Capacitance

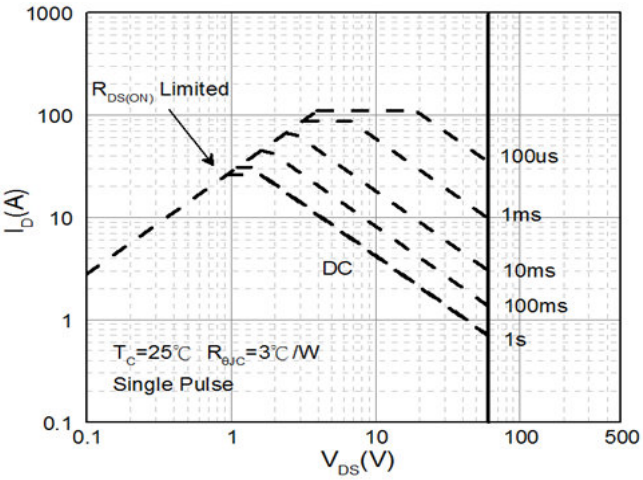


Fig.8 Safe Operating Area

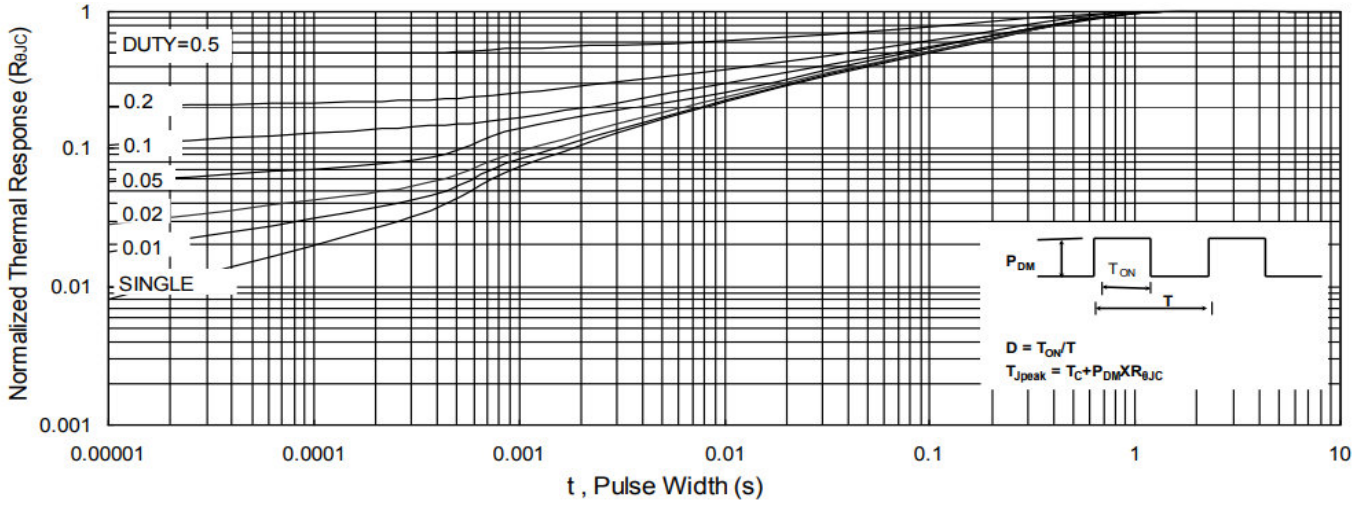


Fig.9 Normalized Maximum Transient Thermal Impedance

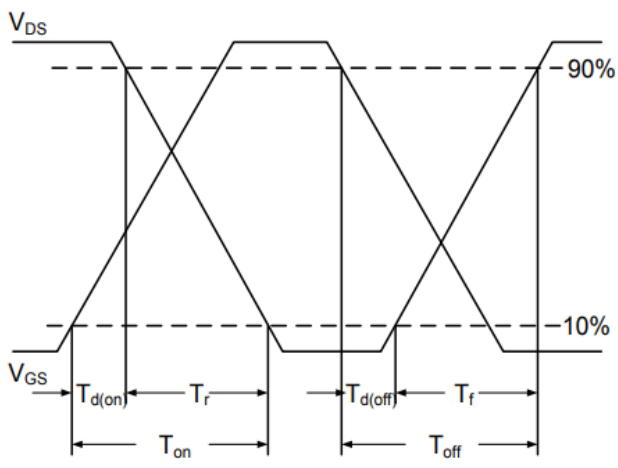


Fig.10 Switching Time Waveform

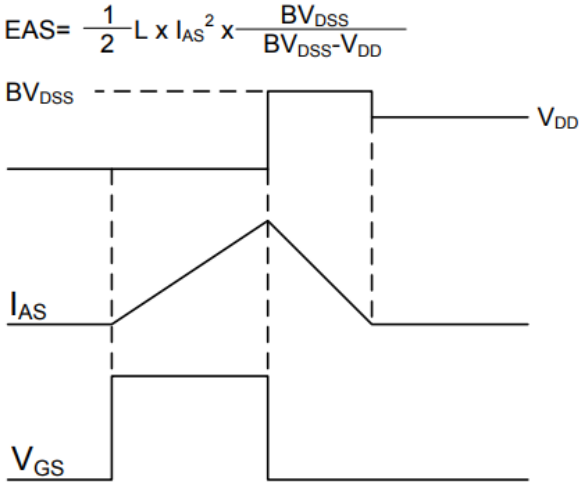


Fig.11 Unclamped Inductive Switching Waveform