

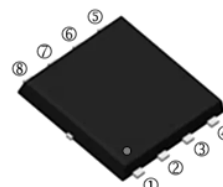
RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## DESCRIPTION

The SPR36N20SV-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 SPR36N20SV-C meet the RoHS and Green Product requirement with full function reliability approved.

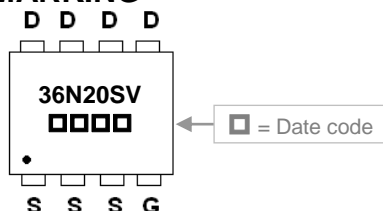
## PR-8PP



## FEATURES

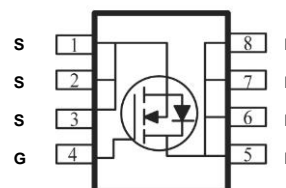
- Shielded Gate Trench Technology
- Green Device Available
- Super Low Gate Charge

## MARKING



## PACKAGE INFORMATION

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



## ORDER INFORMATION

Part Number	Type
SPR36N20SV-C	Lead (Pb)-free and Halogen-free

## ABSOLUTE MAXIMUM RATINGS ( $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	200	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	$T_C=25^\circ\text{C}$	36
		$T_C=100^\circ\text{C}$	25
Pulsed Drain Current <sup>3</sup>	$I_{DM}$	140	A
Total Power Dissipation	$P_D$	125	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Thermal Data			
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	50	$^\circ\text{C/W}$
Thermal Resistance Junction-Ambient <sup>2</sup>		75	
Thermal Resistance Junction-Case <sup>1</sup>		$R_{\theta JC}$	

**ELECTRICAL CHARACTERISTICS** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	$BV_{DSS}$	200	-	-	V	$V_{GS}=0V, I_D=250\mu A$	
Gate-Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu A$	
Forward Transfer Conductance	$g_{fs}$	-	31	-	S	$V_{DS}=5V, I_D=10A$	
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20V$	
Drain-Source Leakage Current	$I_{DSS}$	$T_J=25^\circ\text{C}$	-	-	1	$\mu A$	$V_{DS}=160V, V_{GS}=0V$
		$T_J=55^\circ\text{C}$	-	-	100		$V_{DS}=160V, V_{GS}=0V$
Static Drain-Source On-Resistance <sup>4</sup>	$R_{DS(ON)}$	-	28	32	m $\Omega$	$V_{GS}=10V, I_D=10A$	
Gate Resistance	$R_g$	-	4	-	$\Omega$	$f=1\text{MHz}$	
Total Gate Charge	$Q_g$	-	21.8	-	nC	$I_D=10A$ $V_{DS}=100V$ $V_{GS}=10V$	
Gate-Source Charge	$Q_{gs}$	-	8.6	-			
Gate-Drain Change	$Q_{gd}$	-	3.3	-			
Turn-on Delay Time	$T_{d(on)}$	-	14	-	nS	$V_{DD}=100V$ $I_D=10A$ $V_{GS}=10V$ $R_G=10\Omega$	
Rise Time	$T_r$	-	17.4	-			
Turn-off Delay Time	$T_{d(off)}$	-	31.5	-			
Fall Time	$T_f$	-	16.9	-			
Input Capacitance	$C_{iss}$	-	1630	-	pF	$V_{GS}=0V$ $V_{DS}=100V$ $f=1\text{MHz}$	
Output Capacitance	$C_{oss}$	-	147	-			
Reverse Transfer Capacitance	$C_{rss}$	-	5.5	-			
<b>Source-Drain Diode</b>							
Diode Forward Voltage <sup>4</sup>	$V_{SD}$	-	0.9	1.2	V	$I_S=10A, V_{GS}=0V$	
Continuous Source Current <sup>1</sup>	$I_S$	-	-	36	A		
Pulsed Source Current <sup>3</sup>	$I_{SM}$	-	-	140			
Reverse Recovery Time	$T_{rr}$	-	90	-	nS	$V_R=100V, I_F=10A,$ $di/dt=100A/\mu s$	
Reverse Recovery Charge	$Q_{rr}$	-	306	-	nC		

Notes:

1. Surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper.
2. When mounted on Min. copper pad.
3. The Pulse width limited by maximum junction temperature, Pulse Width $\leq 300\mu s$ , Duty Cycles $\leq 2\%$
4. The Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycles $\leq 2\%$ .

**CHARACTERISTIC CURVES**

Fig 1. Typical Output Characteristics

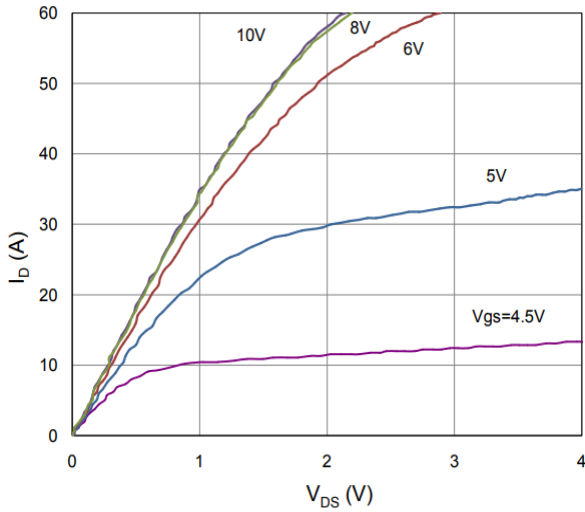


Figure 2. On-Resistance vs. Gate-Source Voltage

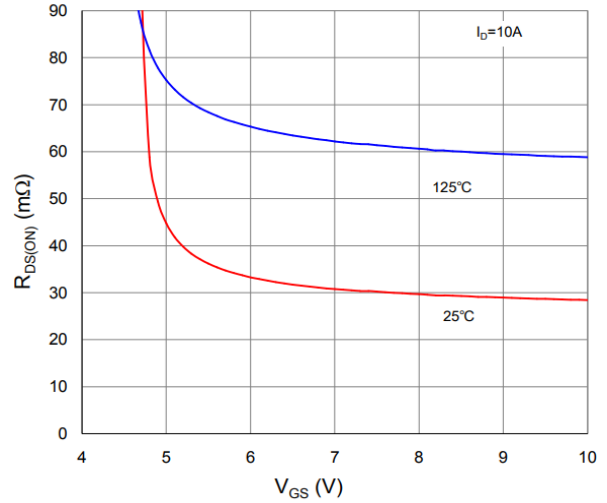


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

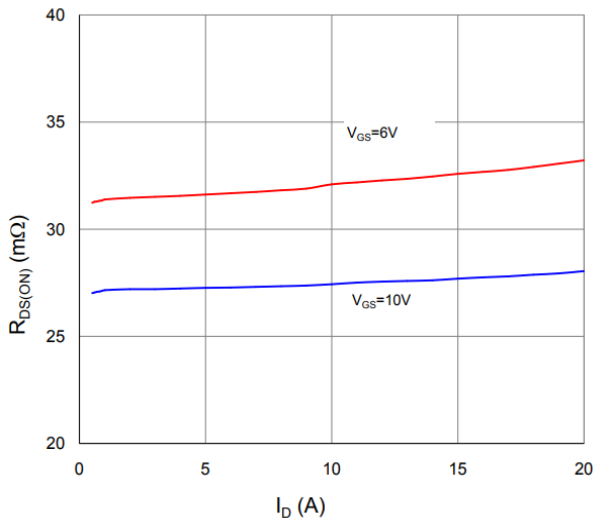


Figure 4. Normalized On-Resistance vs. Junction Temperature

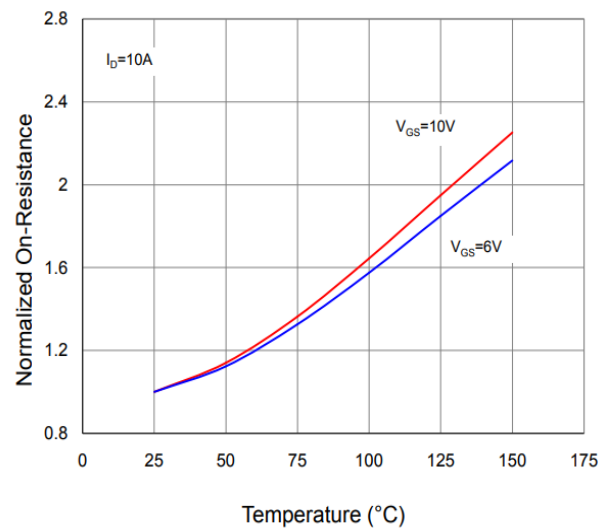


Figure 5. Typical Transfer Characteristics

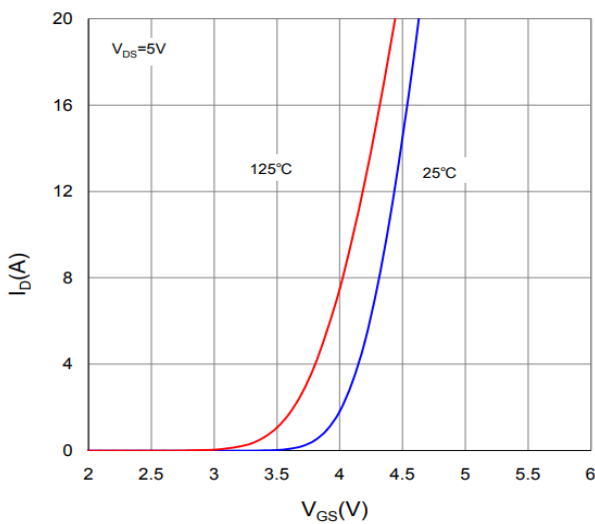
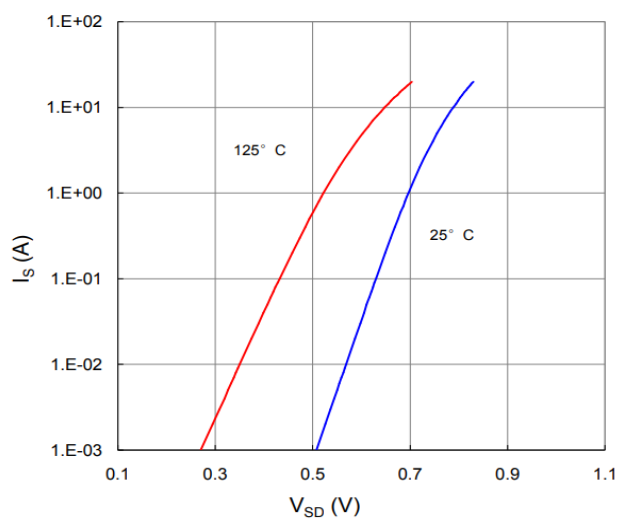


Figure 6. Typical Source-Drain Diode Forward Voltage



**CHARACTERISTIC CURVES**

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

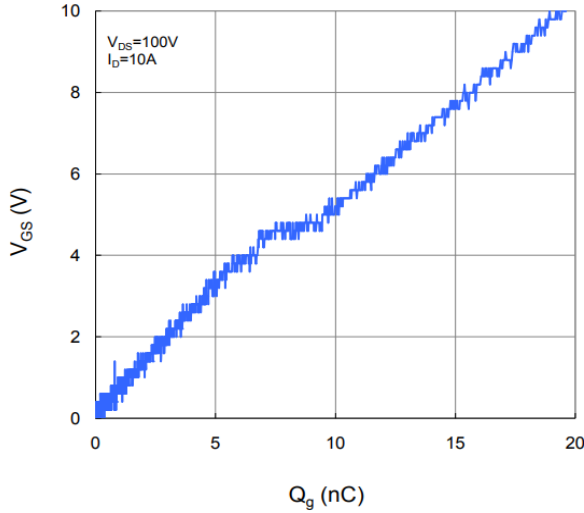


Figure 8. Typical Capacitance vs. Drain-to-Source Voltage

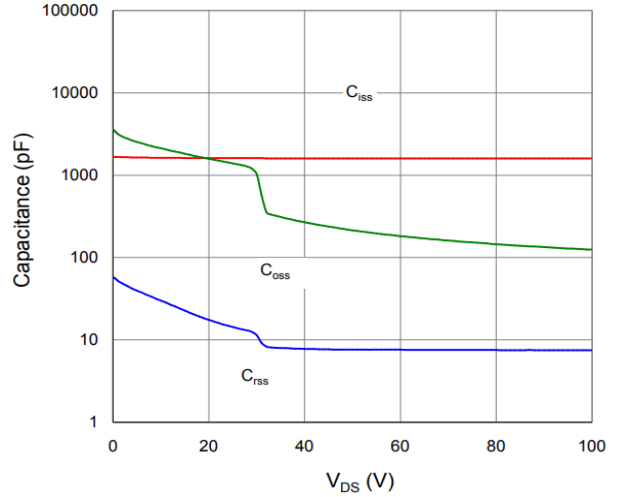


Figure 9. Maximum Safe Operating Area

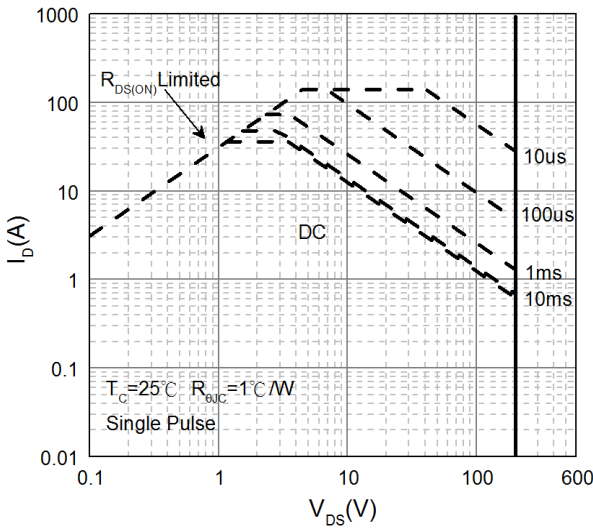


Figure 10. Maximum Drain Current vs. Case Temperature

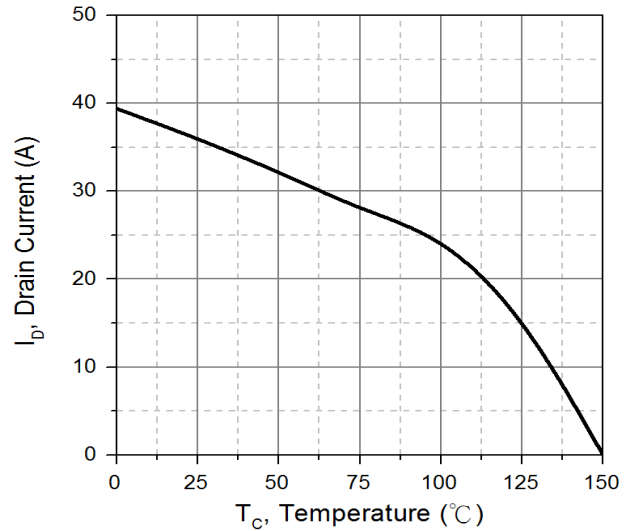
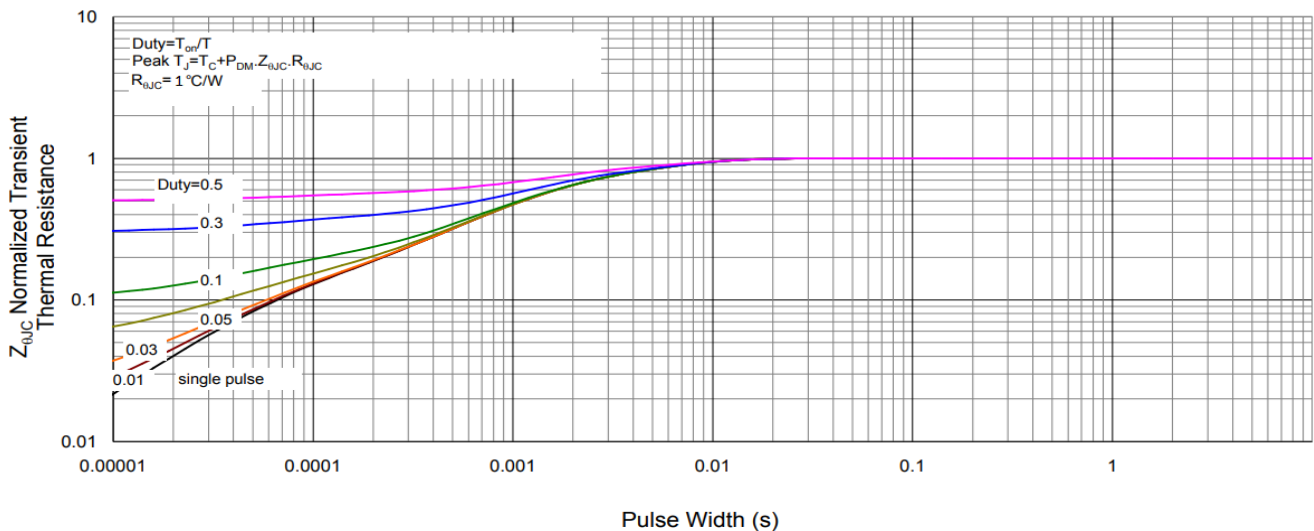
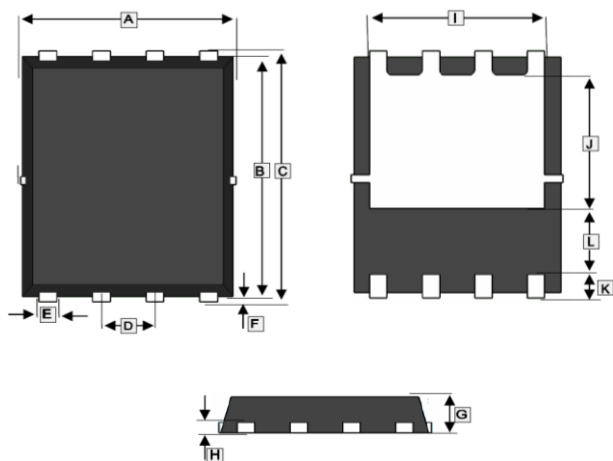


Figure 11. Normalized Maximum Transient Thermal Impedance, Junction-to-Case



**PACKAGE OUTLINE DIMENSIONS**

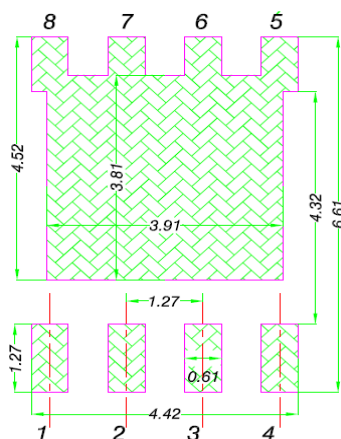
**PR-8PP**



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