

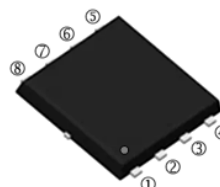
RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## DESCRIPTION

The SPR70P03-C is the highest performance trench P-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 SPR70P03-C meet the RoHS and Green Product requirement with full function reliability approved.

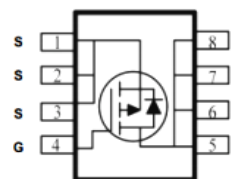
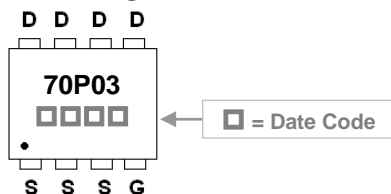
**PR-8PP**



## 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
SPR70P03-C	Lead (Pb)-free and Halogen-free

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup> @ $V_{GS}=10V$	$I_D$	$T_C=25^\circ C$	-70
		$T_C=100^\circ C$	-50
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	-200	A
Total Power Dissipation <sup>3</sup>	$P_D$	78	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ C$
<b>Thermal Resistance Rating</b>			
Thermal Resistance Junction-Ambient <sup>1</sup>	$R_{\theta JA}$	$t \leq 10sec, 20$	$^\circ C/W$
		Steady State, 50	
Thermal Resistance Junction-Case <sup>1</sup>	$R_{\theta JC}$	1.6	

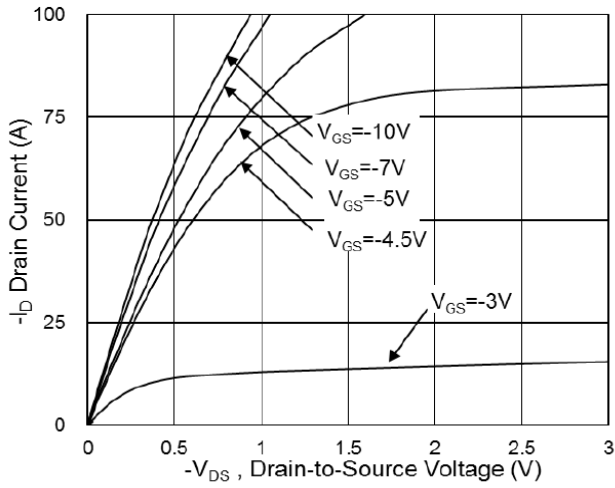
**ELECTRICAL CHARACTERISTICS** ( $T_J=25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions	
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	-	-	V	$V_{GS}=0, I_D=-250\mu\text{A}$	
Gate-Threshold Voltage	$V_{GS(th)}$	-1	-	-2.5	V	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 20\text{V}$	
Drain-Source Leakage Current	$I_{DSS}$	$T_J=25^\circ\text{C}$	-	-	-1	uA	$V_{DS}=-24\text{V}, V_{GS}=0$
		$T_J=55^\circ\text{C}$	-	-	-5		
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	-	7.5	m $\Omega$	$V_{GS}=-10\text{V}, I_D=-20\text{A}$	
		-	-	13		$V_{GS}=-4.5\text{V}, I_D=-15\text{A}$	
Total Gate Charge	$Q_g$	-	60	-	nC	$I_D=-18\text{A}$ $V_{DS}=-15\text{V}$ $V_{GS}=-10\text{V}$	
Gate-Source Charge	$Q_{gs}$	-	9	-			
Gate-Drain Change	$Q_{gd}$	-	15	-			
Turn-on Delay Time	$T_{d(on)}$	-	17	-	nS	$V_{DD}=-15\text{V}$ $I_D=-20\text{A}$ $V_{GS}=-10\text{V}$ $R_G=3.3\Omega$	
Rise Time	$T_r$	-	40	-			
Turn-off Delay Time	$T_{d(off)}$	-	55	-			
Fall Time	$T_f$	-	13	-			
Input Capacitance	$C_{iss}$	-	3450	-	pF	$V_{GS}=0$ $V_{DS}=-25\text{V}$ $f=1\text{MHz}$	
Output Capacitance	$C_{oss}$	-	255	-			
Reverse Transfer Capacitance	$C_{rss}$	-	140	-			
<b>Source-Drain Diode</b>							
Diode Forward Voltage <sup>2</sup>	$V_{SD}$	-	-	-1.2	V	$I_S=-1\text{A}, V_{GS}=0, T_J=25^\circ\text{C}$	
Continuous Source Current <sup>1</sup>	$I_S$	-	-	-70	A		
Reverse Recovery Time	$t_{rr}$	-	22	-	nS	$I_F=-20\text{A}, dI/dt=100\text{A}/\mu\text{s},$	
Reverse Recovery Charge	$Q_{rr}$	-	72	-	nC	$T_J=25^\circ\text{C}$	

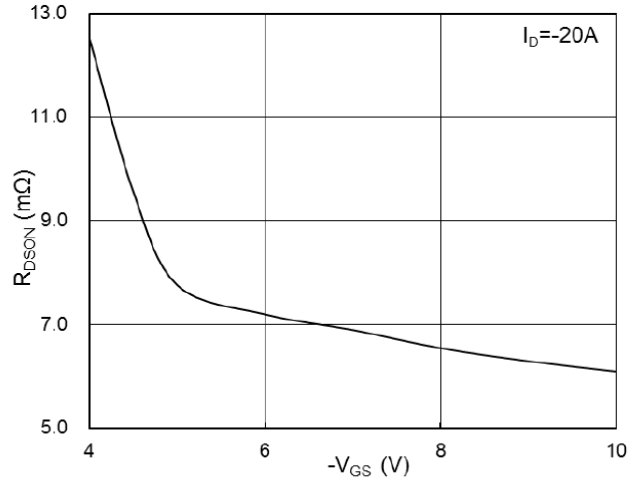
Notes:

1. The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2oz copper.
2. The data tested by pulsed, pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
3. Pulse width limited by maximum junction temperature.

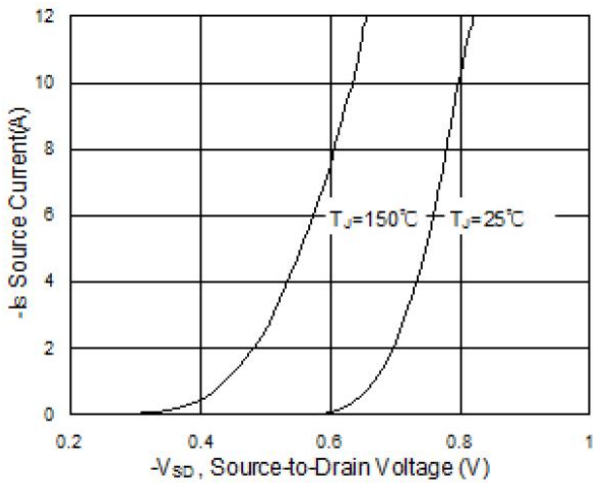
**CHARACTERISTIC CURVES**



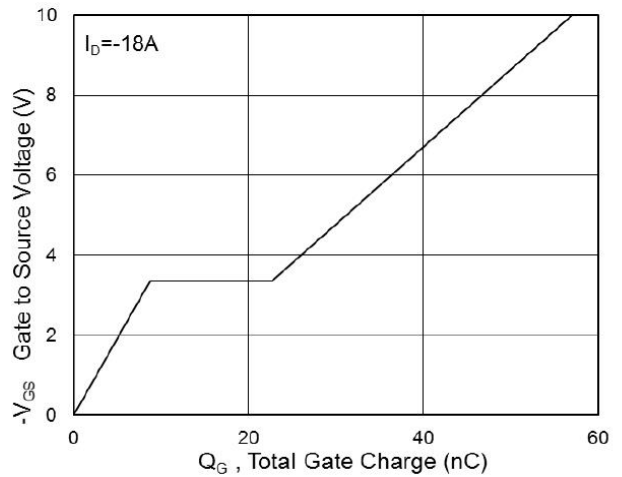
**Fig.1 Typical Output Characteristics**



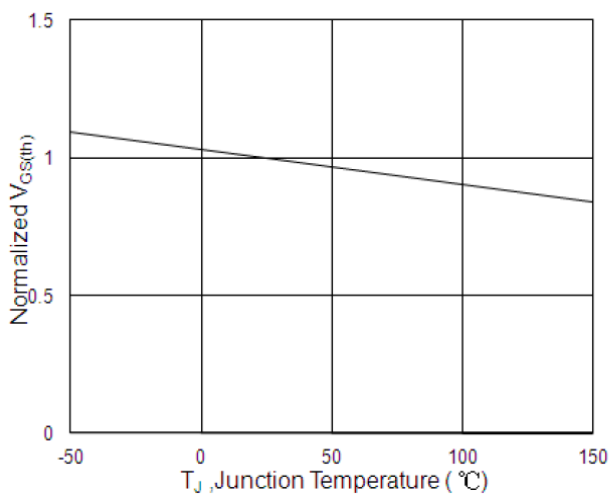
**Fig.2 On-Resistance vs. Gate-Source Voltage**



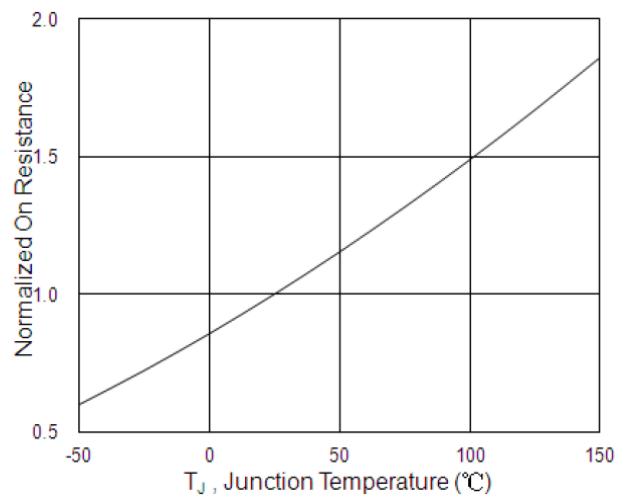
**Fig.3 Forward Characteristics of Reverse**



**Fig.4 Gate-Charge Characteristics**

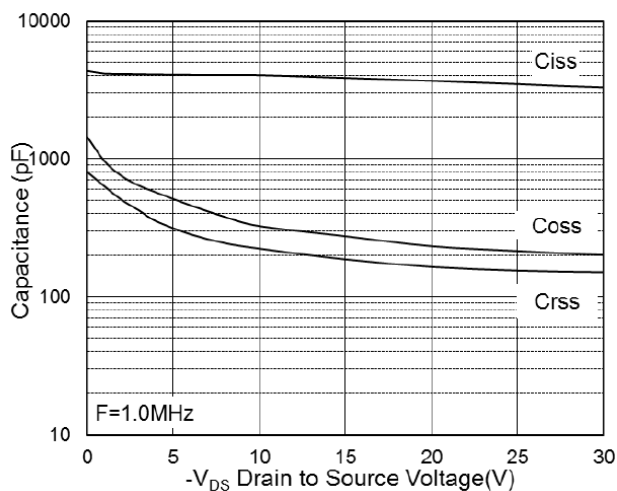


**Fig.5 Normalized  $-V_{GS(th)}$  vs.  $T_J$**

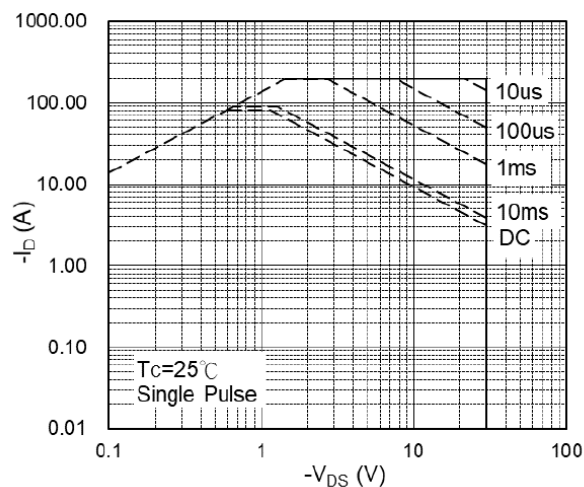


**Fig.6 Normalized  $R_{DS(ON)}$  vs.  $T_J$**

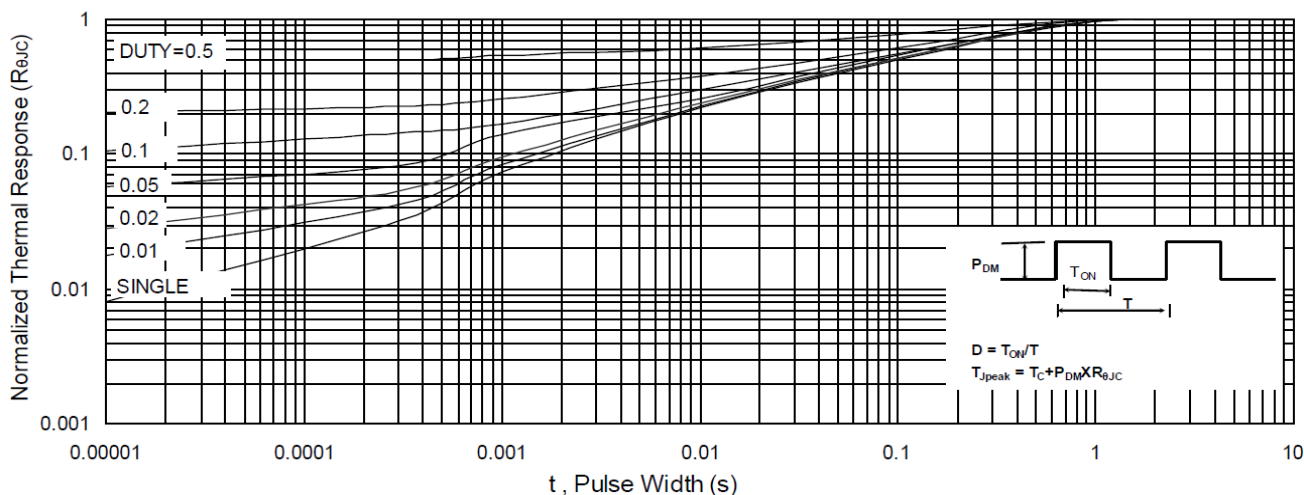
**CHARACTERISTIC CURVES**



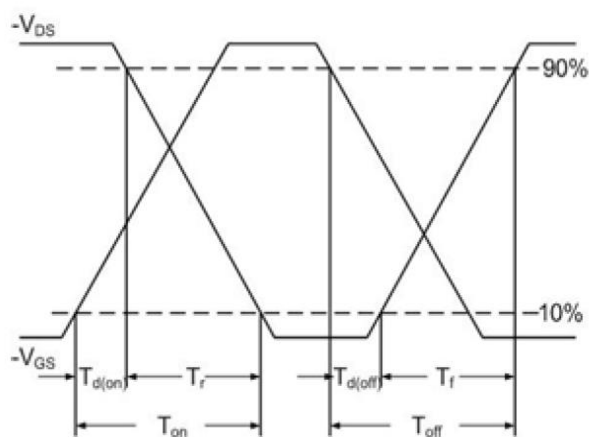
**Fig.7 Capacitance**



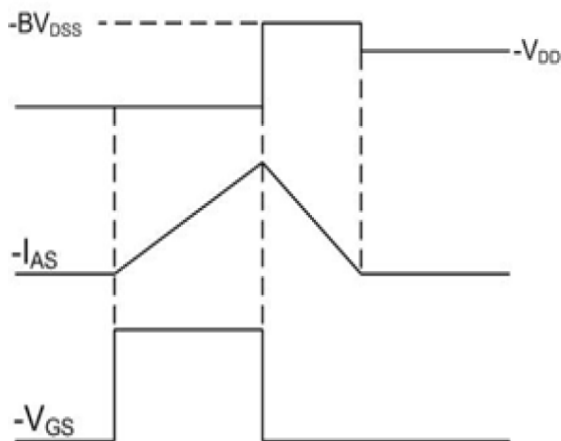
**Fig.8 Safe Operating Area**



**Fig.9 Normalized Maximum Transient Thermal Impedance**



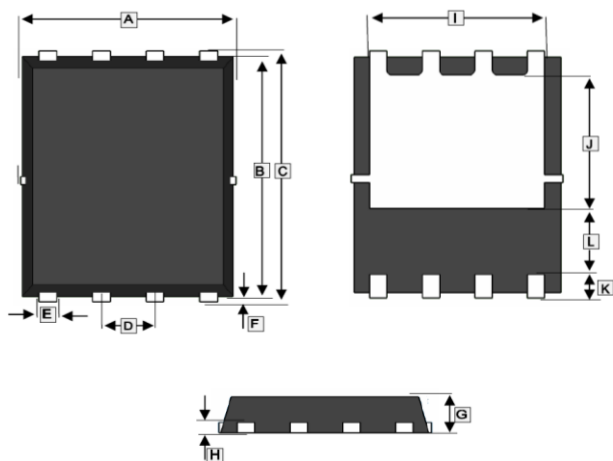
**Fig.10 Switching Time Waveform**



**Fig.11 Unclamped Inductive Switching Waveform**

**PACKAGE OUTLINE DIMENSIONS**

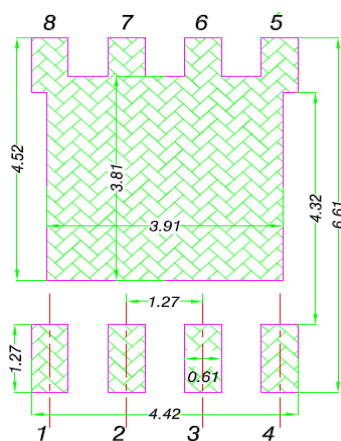
**PR-8PP**



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