

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

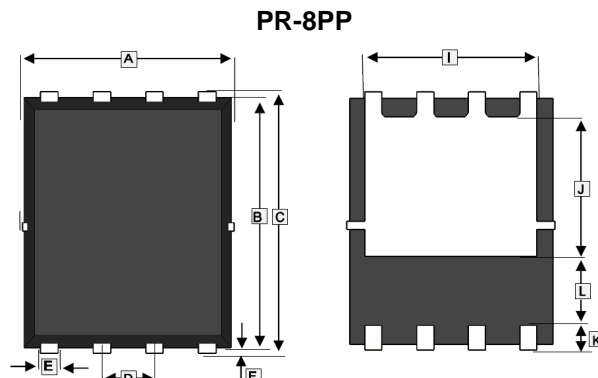
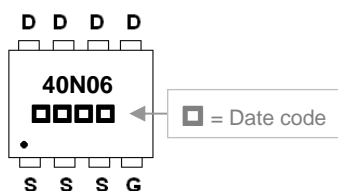
DESCRIPTION

The SPR40N06 provide the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost-effectiveness. The PR-8PP package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- Lower Gate Charge
- Simple Drive Requirement
- Fast Switching Characteristic

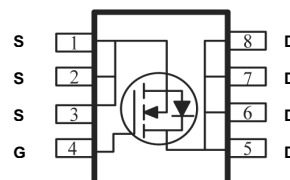
MARKING



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



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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹ @ $V_{GS}=10\text{V}$	I_D	$T_C=25^\circ\text{C}$	40
		$T_C=100^\circ\text{C}$	28
Pulsed Drain Current ²	I_{DM}	110	A
Single Pulse Avalanche Energy ³	EAS	50	mJ
Avalanche Current	I_{AS}	30	A
Total Power Dissipation ⁴	P_D	69	W
Operating Junction & Storage Temperature	T_J, T_{STG}	-55~150	$^\circ\text{C}$
Thermal Resistance Rating			
Thermal Resistance Junction-Ambient ¹ (Max).	$R_{\theta JA}$	36	$^\circ\text{C} / \text{W}$
Thermal Resistance Junction-Case ¹ (Max).	$R_{\theta JC}$	1.8	$^\circ\text{C} / \text{W}$

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

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	$V_{GS}=0, I_D=250\mu\text{A}$
Gate-Threshold Voltage	$V_{GS(th)}$	2	-	4	V	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}= \pm 20\text{V}$
Drain-Source Leakage Current	I_{DSS}	-	-	1	uA	$V_{DS}=60\text{V}, V_{GS}=0, T_J=25^\circ\text{C}$
		-	-	5		$V_{DS}=60\text{V}, V_{GS}=0, T_J=55^\circ\text{C}$
Static Drain-Source On-Resistance ²	$R_{DS(ON)}$	-	-	12	m Ω	$V_{GS}=10\text{V}, I_D=20\text{A}$
Gate Resistance	R_g	-	-	3.5	Ω	$f=1.0\text{MHz}$
Total Gate Charge	Q_g	-	20	-	nC	$I_D=20\text{A}$ $V_{DS}=30\text{V}$ $V_{GS}=10\text{V}$
Gate-Source Charge	Q_{gs}	-	5	-		
Gate-Drain Change	Q_{gd}	-	1.8	-		
Turn-on Delay Time ²	$T_{d(on)}$	-	6	-	nS	$V_{DD}=30\text{V}$ $V_{GS}=10\text{V}$ $R_L=1.5\Omega$ $R_G=3\Omega$
Rise Time	T_r	-	2.5	-		
Turn-off Delay Time	$T_{d(off)}$	-	25	-		
Fall Time	T_f	-	2.5	-		
Input Capacitance	C_{iss}	-	1543	-	pF	$V_{GS}=0$ $V_{DS}=30\text{V}$ $f=1.0\text{MHz}$
Output Capacitance	C_{oss}	-	165	-		
Reverse Transfer Capacitance	C_{rss}	-	9	-		
Guaranteed Avalanche Characteristics						
Single Pulse Avalanche Energy ⁵	EAS	22	-	-	mJ	$V_D=25\text{V}, L=0.1\text{mH}, I_{AS}=20\text{A}$
Source-Drain Diode						
Diode Forward Voltage ²	V_{SD}	-	-	1.3	V	$I_S=20\text{A}, V_{GS}=0$
Continuous Source Current ^{1,6}	I_S	-	-	40	A	$V_D=V_G=0, \text{Force Current}$
Pulsed Source Current ^{2,6}	I_{SM}	-	-	110	A	
Reverse Recovery Time	T_{rr}	-	18	-	nS	$I_F=20\text{A}, di/dt=100\text{A}/\mu\text{S}, T_J=25^\circ\text{C}$
Reverse Recovery Charge	Q_{rr}	-	65	-	nC	

Note:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper , $\leq 10\text{sec}$, $125^\circ\text{C}/\text{W}$ at steady state
- The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- The EAS data shows Max. rating . The test condition is $V_{DD}=25\text{V}, V_{GS}=10\text{V}, L=0.1\text{mH}, I_{AS}=30\text{A}$
- The power dissipation is limited by 150°C juncti on temperature
- The Min. value is 100% EAS tested guarantee.
- The data is theoretically the same as ID and IDM , in real applications , should be limited by total power dissipation.

CHARACTERISTIC CURVES

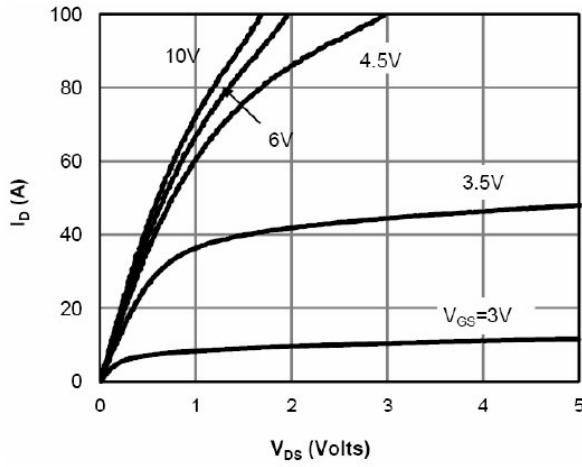


Fig 1. Typical Output Characteristics

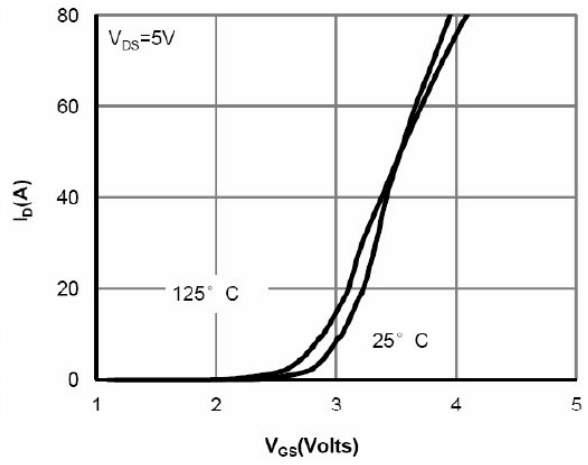


Fig 2. Transfer Characteristics

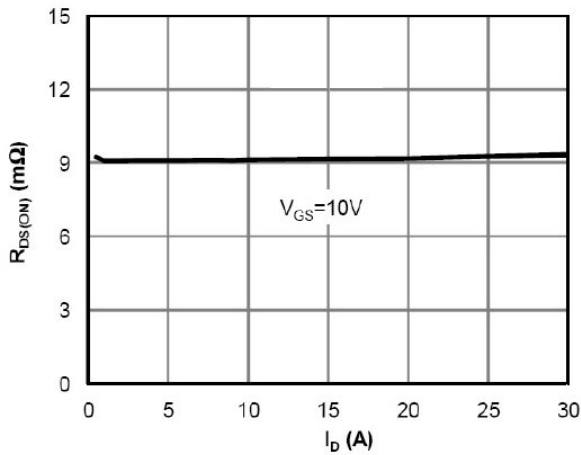


Fig 3. On-Resistance vs. Drain Current

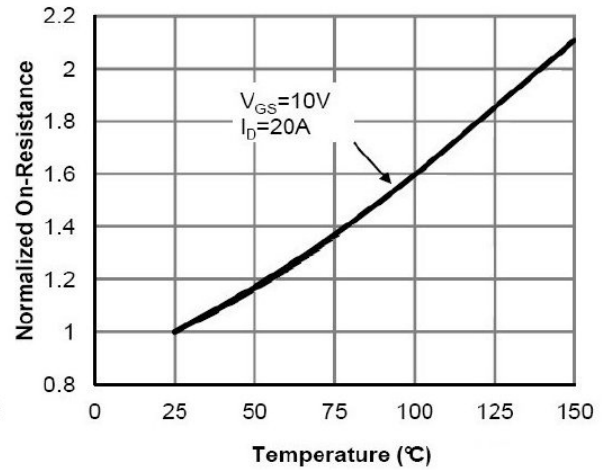


Fig 4. On-Resistance vs. Junction Temperature

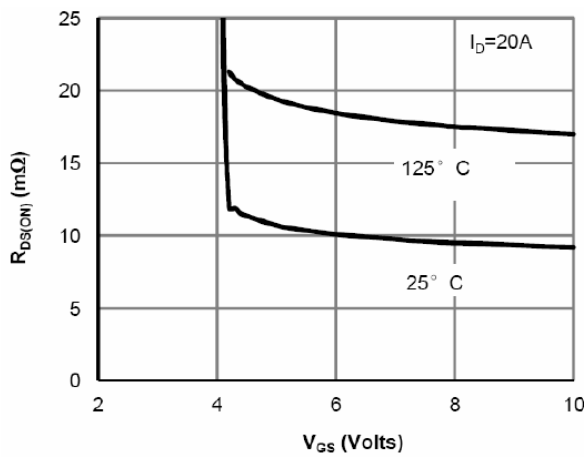


Fig 5. On-Resistance vs. Gate-Source Voltage

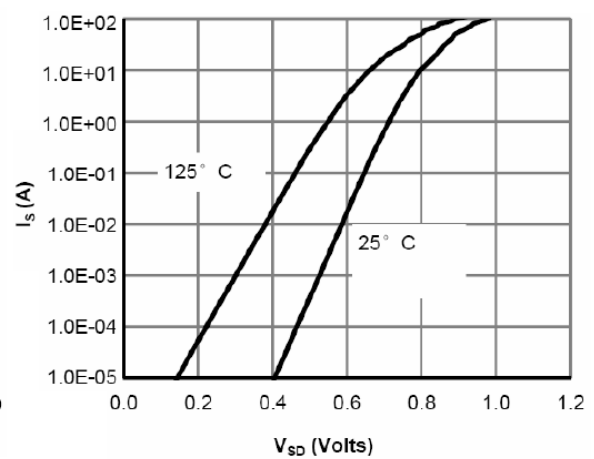


Fig 6. Body Diode Characteristics

CHARACTERISTIC CURVES

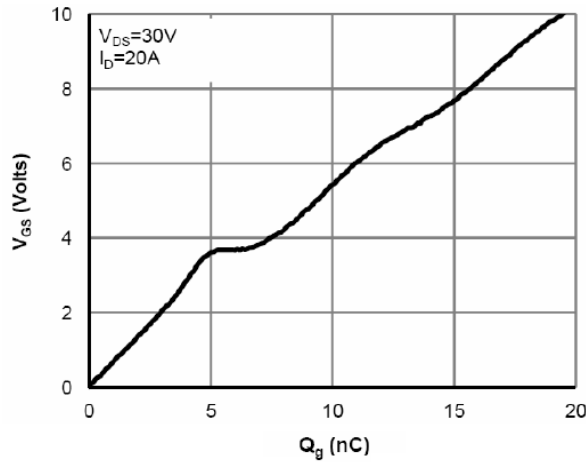


Fig 7. Gate Charge Characteristics

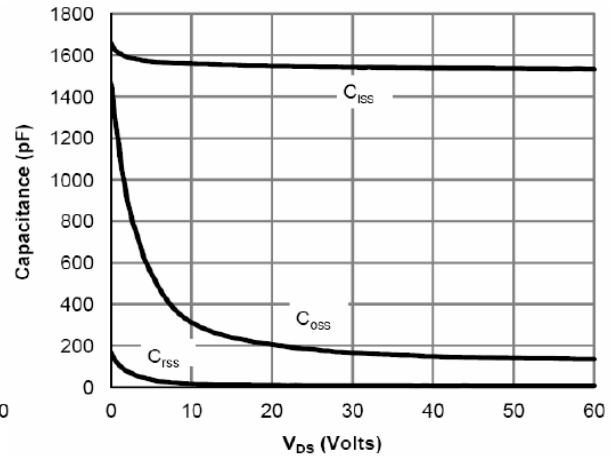


Fig 8. Typical Capacitance Characteristics

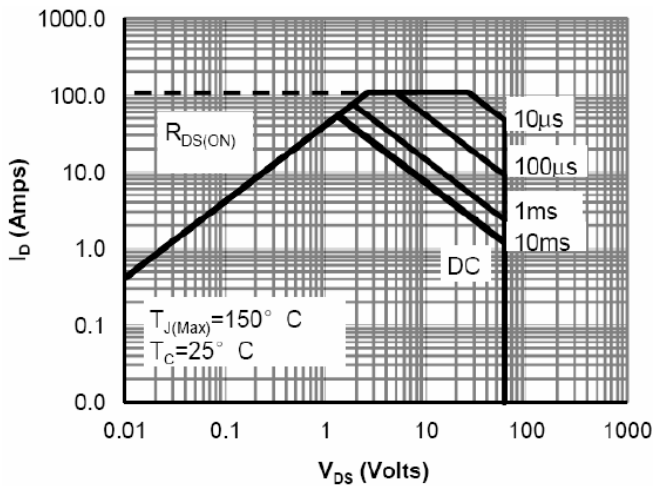


Fig 9. Safe Operating Area

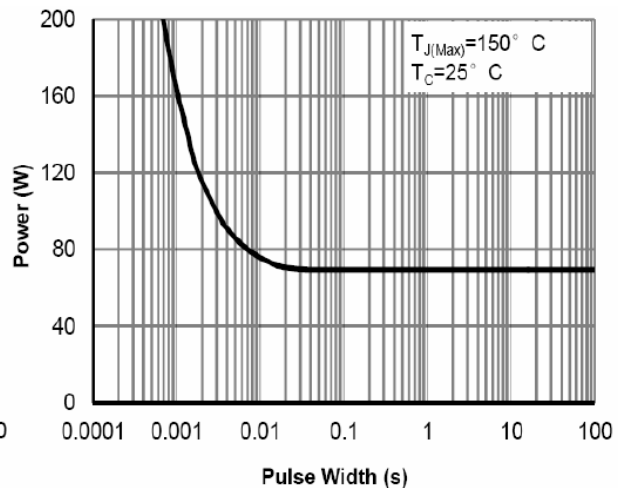


Fig 10. Single Pulse Power

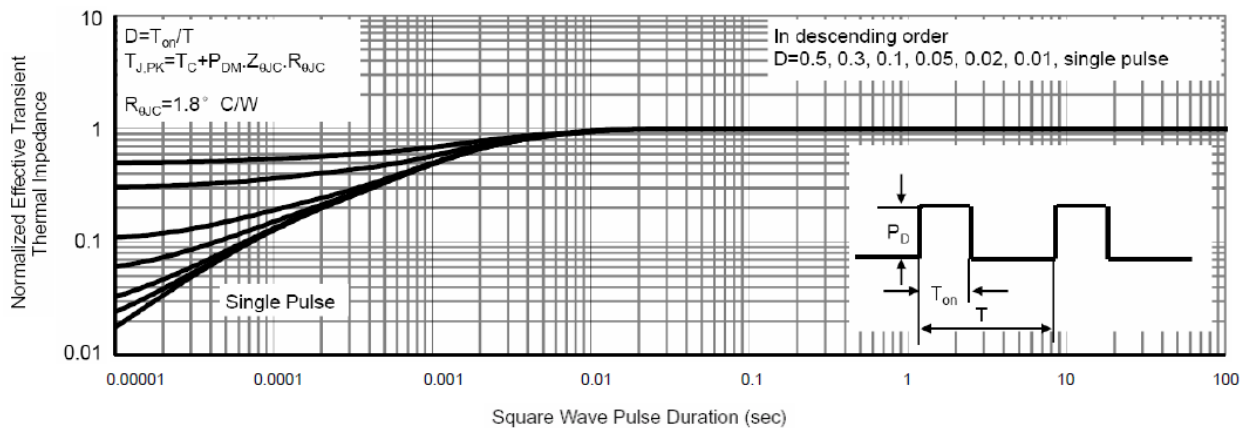


Fig 11. Normalized Maximum Transient Thermal Impedance