

40V N-Channel Enhancement Mode MOSFET

Description

The CP75S04QR uses SGT technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of $R_{DS(ON)}$ and Q_g . This device is ideal for high-frequency switching and synchronous rectification.

General Features

- ◆ $V_{DS} = 40V$, $I_D = 75A$
 $R_{DS(ON)} = 4.5m\Omega$ (typical) @ $V_{GS} = 10V$
 $R_{DS(ON)} = 6.3m\Omega$ (typical) @ $V_{GS} = 4.5V$
- ◆ Excellent gate charge x $R_{DS(ON)}$ product(FOM)
- ◆ Very low on-resistance $R_{DS(ON)}$
- ◆ 150 °C operating temperature
- ◆ Pb-free lead plating
- ◆ 100% UIS tested

Application

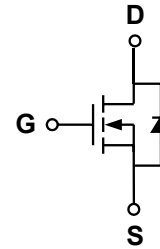
- ◆ DC/DC Converter
- ◆ Ideal for high-frequency switching and synchronous rectification

Package

- ◆ PDFN3X3-8L



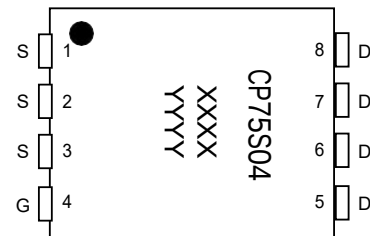
Schematic diagram



Marking and pin assignment

PDFN3×3-8L

(Top View)



XXXX—Wafer Information

YYYY—Quality Code

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
CP75S04QR-G	-55°C to +150°C	PDFN3X3-8L	5000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	40	V
Gate-source voltage	V_{GS}	±20	V
Drain Current-Continuous (Silicon Limited)	I_D	75	A
Drain Current-Continuous($T_C=100^\circ C$)	I_D (100°C)	64	A
Pulsed Drain Current (Package Limited)	I_{DM}	300	A

Single pulse avalanche energy	E_{AS}	100	mJ
Maximum power dissipation	P_D	83	W
Operating junction Temperature range	T_j	-55—150	°C

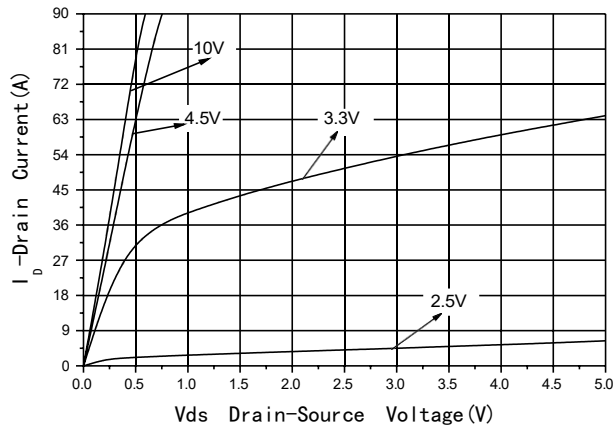
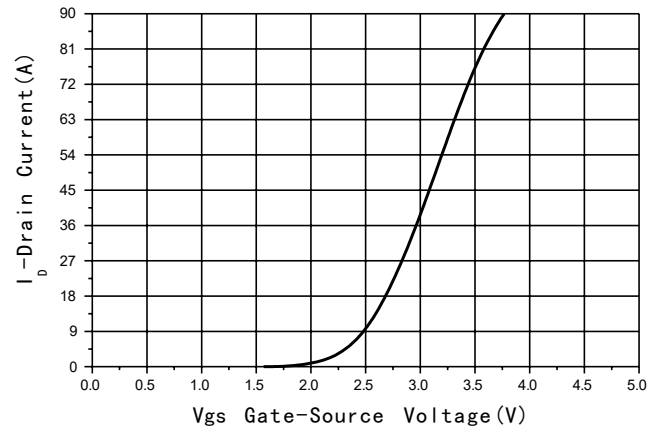
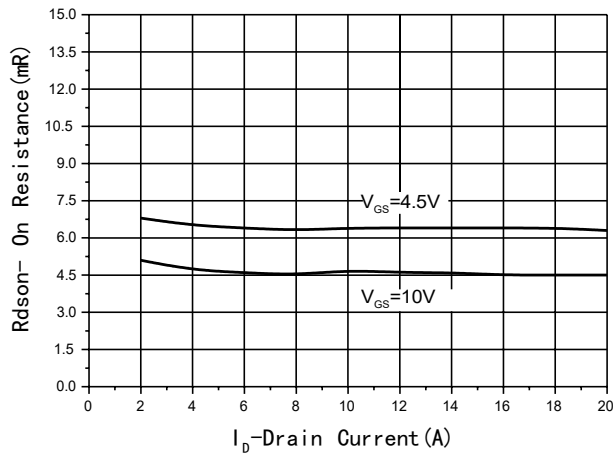
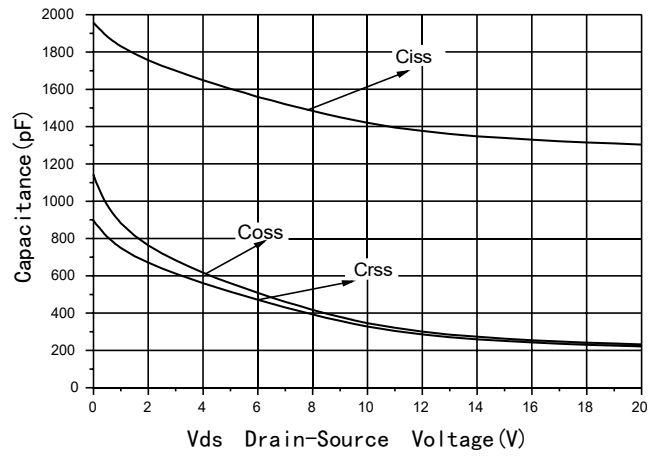
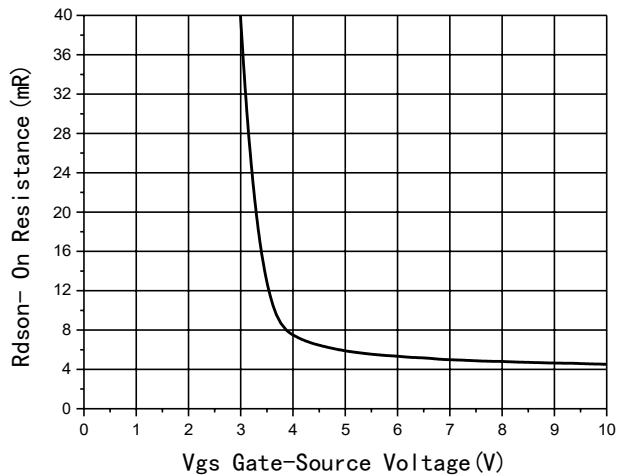
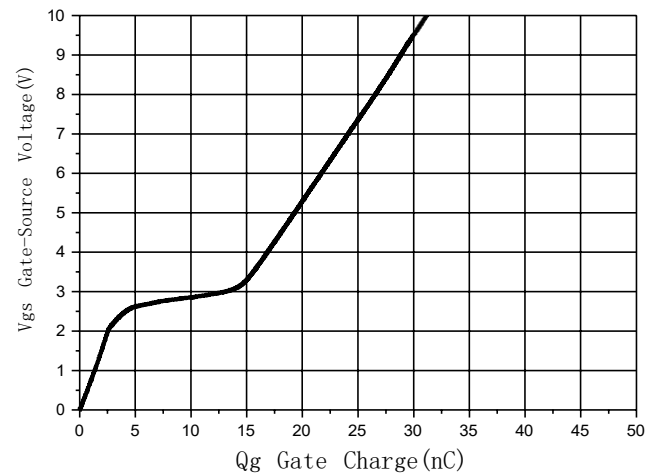
Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40	-	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=40V, V_{GS}=0V$	-	-	1	μA
Gate-body leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 20V$	-	-	± 10	μA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	1.0	1.6	2	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=20A$	-	4.5	6.2	m Ω
		$V_{GS}=4.5V, I_D=20A$	-	6.3	7.5	
Forward transconductance	g_{fs}	$V_{DS}=5V, I_D=20A$	26	30	-	S
Dynamic Characteristics						
Input capacitance	C_{ISS}	$V_{DS}=-20V, V_{GS}=0V$ $f=1.0MHz$	-	1303	-	pF
Output capacitance	C_{OSS}		-	232	-	
Reverse transfer capacitance	C_{RSS}		-	221	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	$V_{DS}=-20V$ $I_D=-2.8A$ $V_{GEN}=-4.5V$ $R_L=10ohm$ $R_{GEN}=-60ohm$	-	14	-	ns
Rise time	t_r		-	18	-	
Turn-off delay time	$t_{D(OFF)}$		-	50	-	
Fall time	t_f		-	21	-	
Total gate charge	Q_g	$V_{DS}=-20V, I_D=-3A$ $V_{GS}=-4.5V$	-	31.6	-	nC
Gate-source charge	Q_{gs}		-	4.3	-	
Gate-drain charge	Q_{gd}		-	9.5	-	

Thermal Characteristics

Thermal Resistance junction-to ambient	$R_{th JA}$	100	°C/W
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Typical Performance Characteristics


Fig1 Output Characteristics

Fig2 Transfer Characteristics

Fig3 $R_{DS(on)}$ -Drain current

Fig4 Capacitance vs V_{DS}

Fig5 $R_{DS(on)}$ -Gate Drain voltage

Fig6 Gate Charge

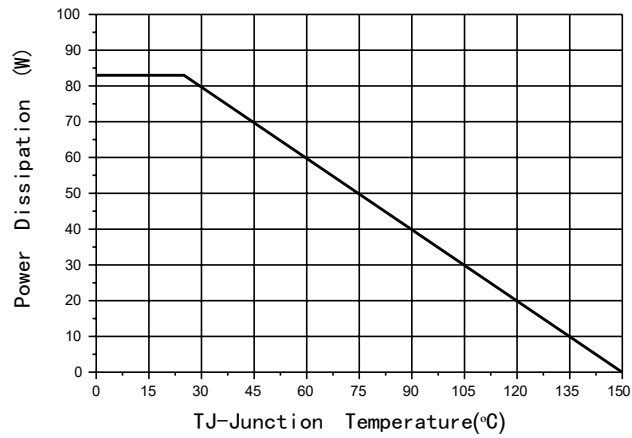


Fig7 Power De-rating

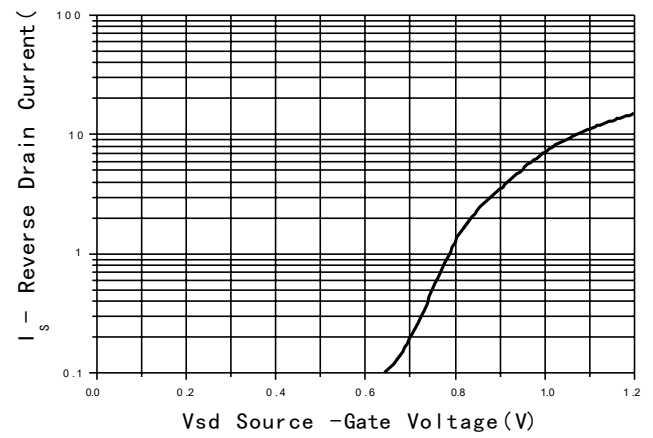


Fig8 Source-Drain Diode Forward

Package Information

- PDFN3*3-8L

