CHENG HUA
SHEN ZHEN SHI CHENG HUA ELECTRONICS CO.,LTD 程华电子

● General Description

The CH80P06D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$.
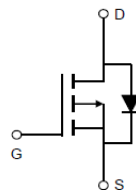
● Features

■ Advance high cell density Trench technology

■ Low $R_{DS(ON)}$ to minimize conductive loss

■ Low Gate Charge for fast switching

■ Low Thermal resistance

●Application

■ MB/VGA Vcore

■ SMPS 2nd Synchronous Rectifier
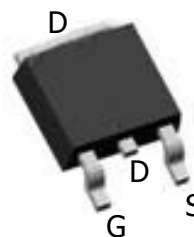
■ POL application

■ BLDC Motor driver

● Product Summary

$V_{DS} = -60V$

$R_{DS(ON)} = 16m\Omega$

$I_D = -80A$

TO-252

RoHS

●Ordering Information:

Part NO.	CH80P06D
Marking	CH80P06D
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

●Absolute Maximum Ratings（$T_C = 25℃$）

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current	I_D@TC=25℃	-80	A
	I_D@TC=75℃	-72	A
	I_D@TC=100℃	-64	A
Pulsed Drain Current [①]	I_{DM}	-320	A
Total Power Dissipation	P_D@TC=25℃	270	W
Total Power Dissipation	P_D@TA=25℃	3.5	W
Operating Junction Temperature	T_J	-55 to 150	℃
Storage Temperature	T_{STG}	-55 to 150	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	750	mJ

●**Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	3.1	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	48	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	°C

●**Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250uA$	-60			V
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS}=V_{DS}, I_D=-250uA$	-1.1	-1.6	-2.2	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=-60V, V_{GS}=0V$			-1.0	uA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm20V, V_{DS}=0V$			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=-10V, I_D=-20A$		16	22	mΩ
		$V_{GS}=-4.5V, I_D=-20A$		19	24	mΩ
Forward Transconductance	g_{FS}	$V_{DS}=-10V, I_D=-10A$		25		s

●**Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	Ciss		-	4400	-	
Output capacitance	Coss	f = 1MHz	-	259	-	pF
Reverse transfer capacitance	Crss		-	212	-	

●**Gate Charge characteristics**($T_a = 25℃$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Qg	$V_{DD}=-30V$	-	115	-	
Gate - Source charge	Qgs	$I_D=-20A$	-	28	-	nC
Gate - Drain charge	Qgd	$V_{GS}=-10V$	-	50	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate；

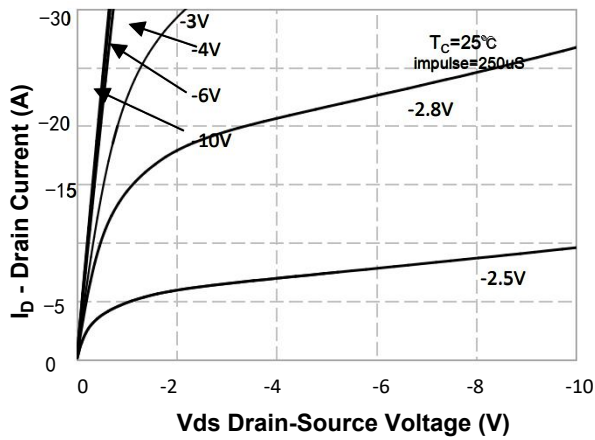## P- Channel Typical Characteristics

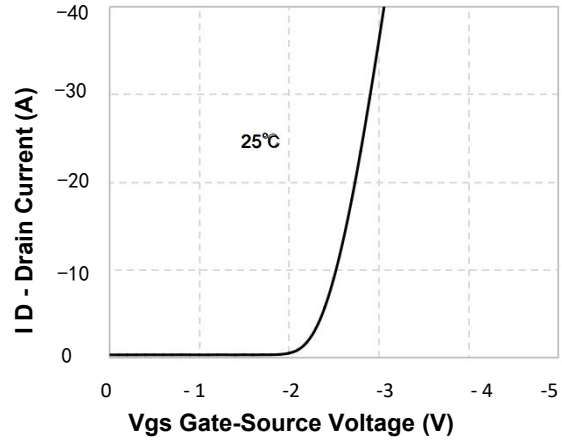

Figure 1. On-Region Characteristics
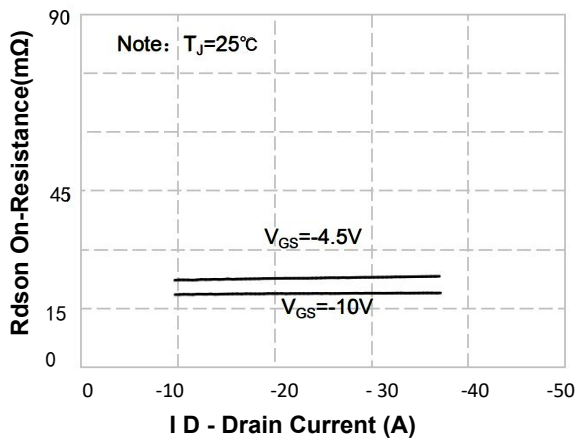

Figure 2. Transfer Characteristics

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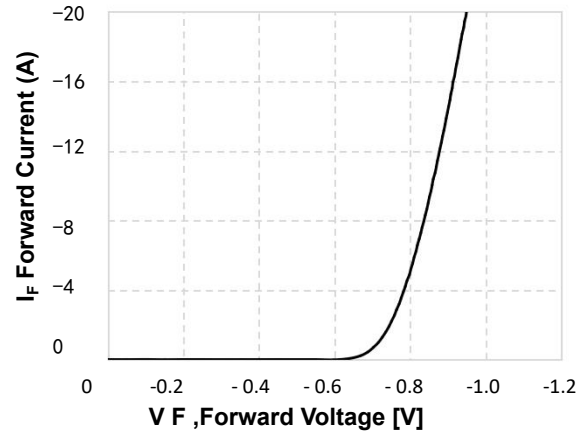

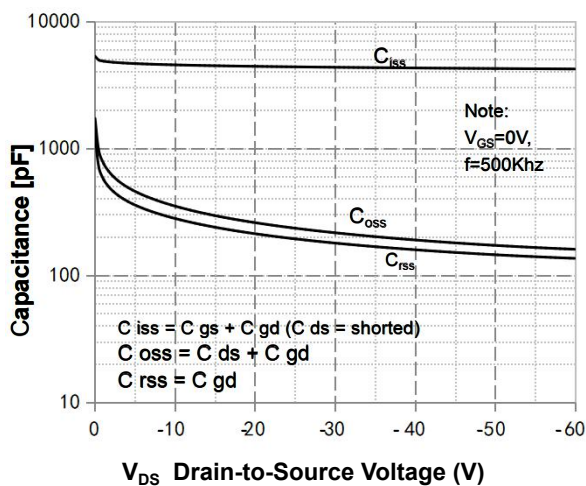Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature

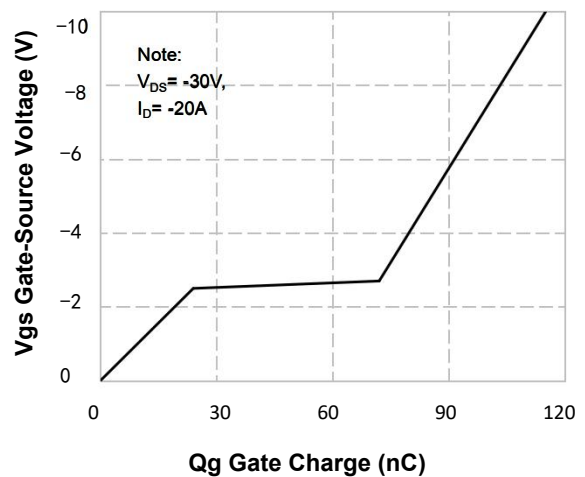Figure 5. Capacitance Characteristics

Figure 6. Gate Charge Characteristics

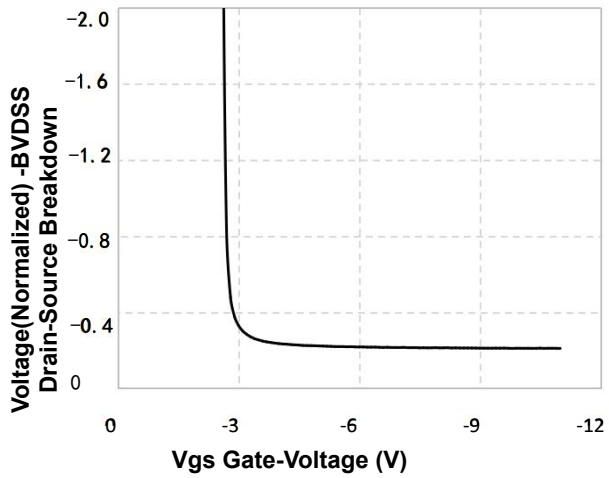## P- Channel Typical Characteristics (Continued)
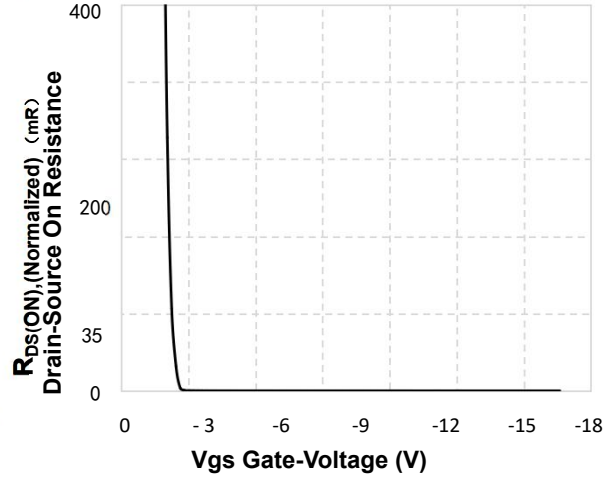
Figure 7.   Breakdown Voltage Variation vs Gate-Voltage

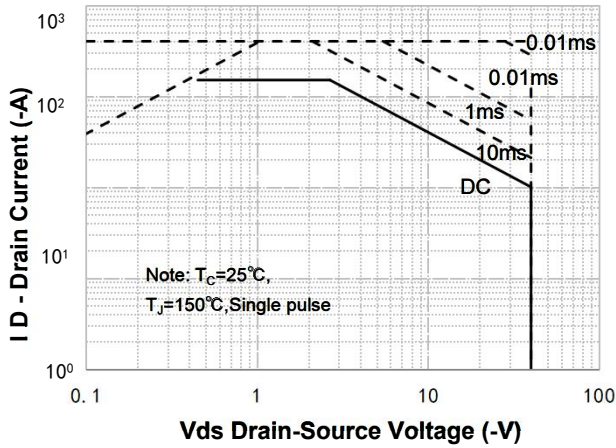Figure 8. On-Resistance Variation vs Gate Voltage

Note: $T_C=25℃$,
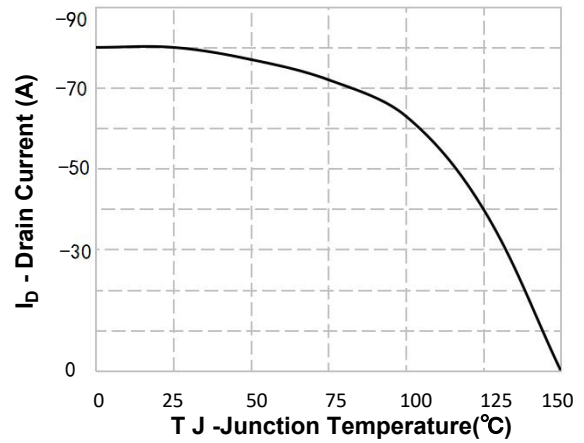$T_J=150℃$,Single pulse

Figure 9. Maximum Safe Operating Area

Figure 10. Maximum PContinuous Drain Currentvs Case Temperature

$T_j-T_C=P_{DM}*Z_{θjc(t)}$
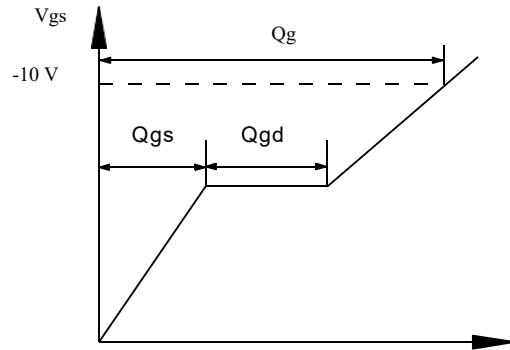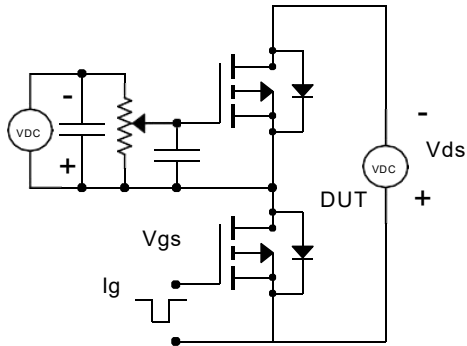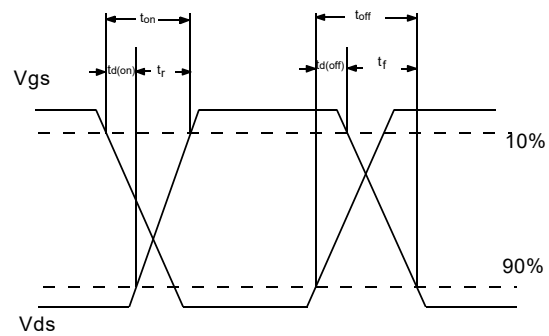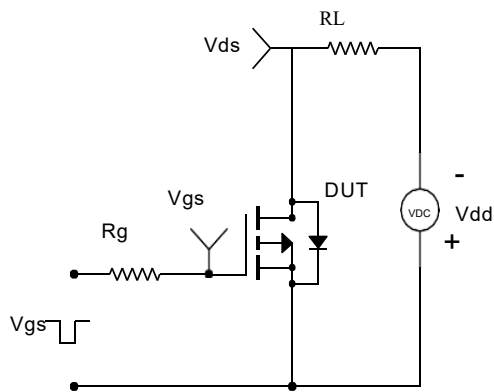Duty Factor: D=t1/t2
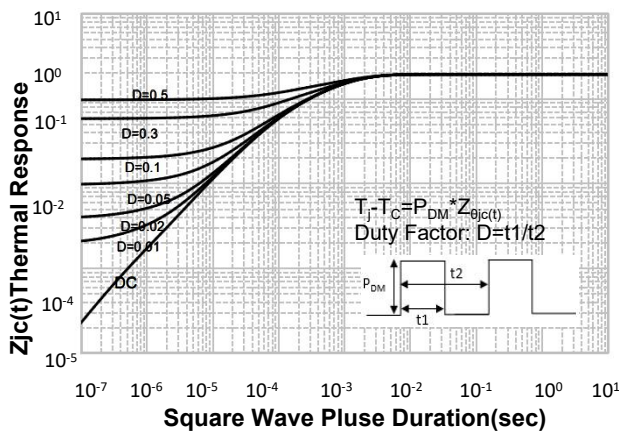
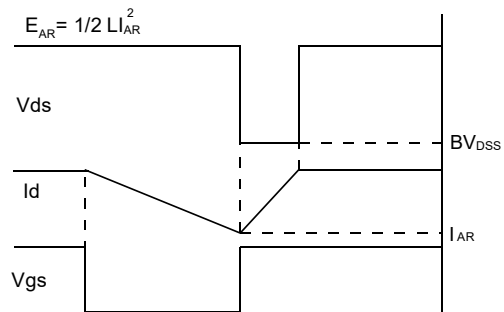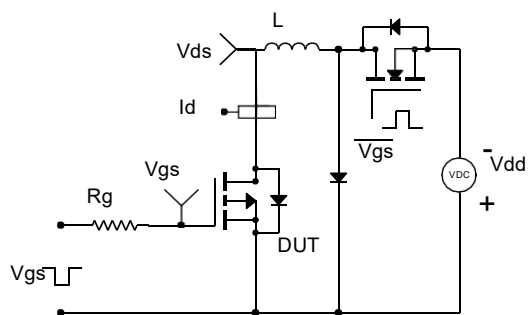Figure 11. Transient Thermal Response Curve

Gate Charge Test Circuit & Waveform

Resistive Switching Test Circuit & Waveforms

Unclamped Inductive Switching Test Circuit & Waveforms

$$E_{AR}= 1/2 \, LI_{AR}^{2}$$

Peak Diode Recovery dv/dt Test Circuit & Waveforms
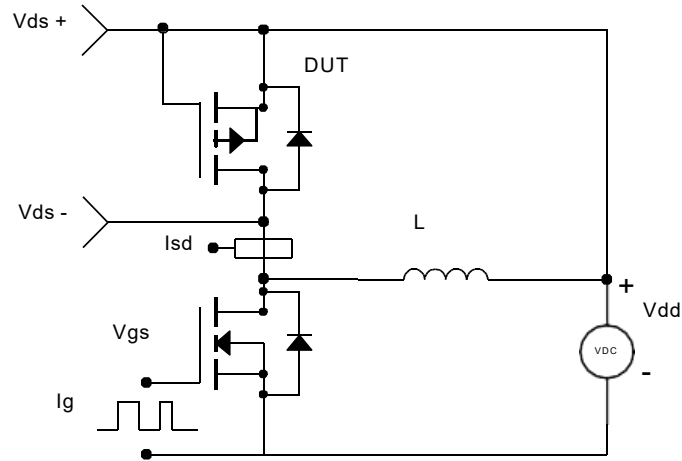
- dv/dt controlled by R_G
- I_{SD} controlled by pulse period

V_{GS} (Driver)

$$D = \frac{\text{Gate Pulse Width}}{\text{Gate Pulse Period}}$$

$-I_S$ (DUT)

$-I_{FM}$, Body Diode Forward Current

di/dt

$-I_{RM}$

Body Diode Reverse Current

$-V_{DS}$ (DUT)

Body Diode Recovery dv/dt

V_{DD}

$-V_f$

Body Diode
Forward Voltage Drop
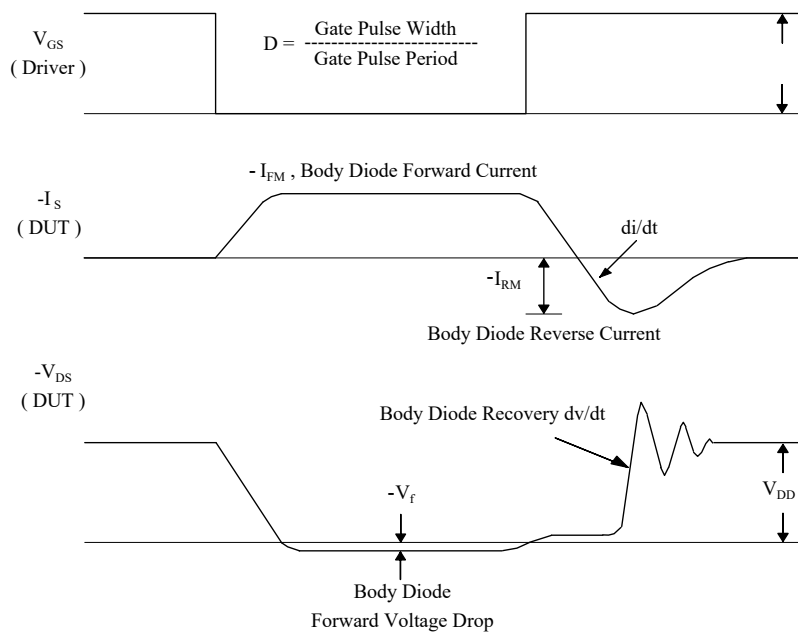
● Dimensions (TO-252)

Unit：mm

SYMBOL	min	max	SYMBOL	min	max
A	2.10	2.50	B	0.85	1.25
b	0.50	0.80	b1	0.50	0.90
b2	0.45	0.70	C	0.45	0.70
D	6.30	6.75	D1	5.10	5.50
E	5.30	6.30	e1	2.25	2.35
L1	9.20	10.60	e2	4.45	4.75
L2	0.90	1.75	L3	0.60	1.10
K	0.00	0.23			