

### • General Description

The CH80P06N combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .

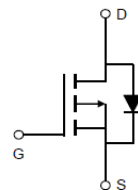
### • Features

- 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 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

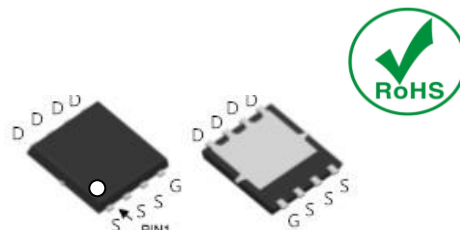
### • Product Summary



$$V_{DS} = -60V$$

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

$$I_D = -80A$$



DFN5 x 6

### • Ordering Information:

Part NO.	CH80P06N
Marking	CH80P06N
Packing Information	REEL TAPE
Basic ordering unit (pcs)	5000

### • Absolute Maximum Ratings ( $T_c = 25^\circ C$ )

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D @ TC=25^\circ C$	-80	A
	$I_D @ TC=75^\circ C$	-72	A
	$I_D @ TC=100^\circ C$	-64	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	-350	A
Total Power Dissipation	$P_D @ TC=25^\circ C$	300	W
Total Power Dissipation	$P_D @ TA=25^\circ C$	3.8	W
Operating Junction Temperature	$T_J$	-55 to 150	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 150	$^\circ C$
Single Pulse Avalanche Energy @ $L=0.1mH$	$E_{AS}$	750	mJ

**● Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	$R_{thJC}$	-	-	3.0	$^{\circ}C/W$
Thermal resistance, junction - ambient	$R_{thJA}$	-	-	45	$^{\circ}C/W$
Soldering temperature, wavesoldering for 10s	$T_{sold}$	-	-	265	$^{\circ}C$

**● Electronic Characteristics**

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

**● Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Input capacitance	$C_{iss}$	$f = 1MHz$	-	4400	-	$\mu F$
Output capacitance	$C_{oss}$		-	259	-	
Reverse transfer capacitance	$C_{rss}$		-	212	-	

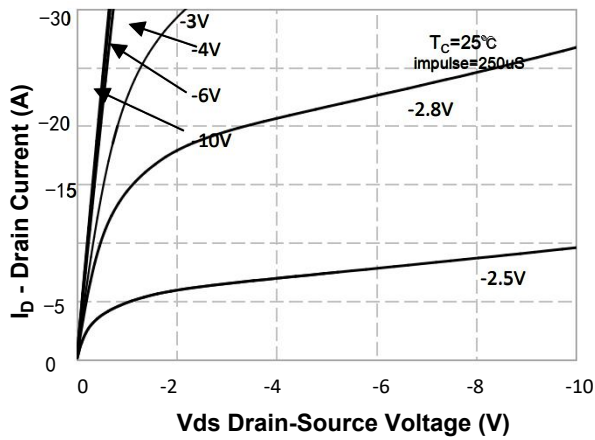
**● Gate Charge characteristics ( $T_a = 25^{\circ}C$ )**

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

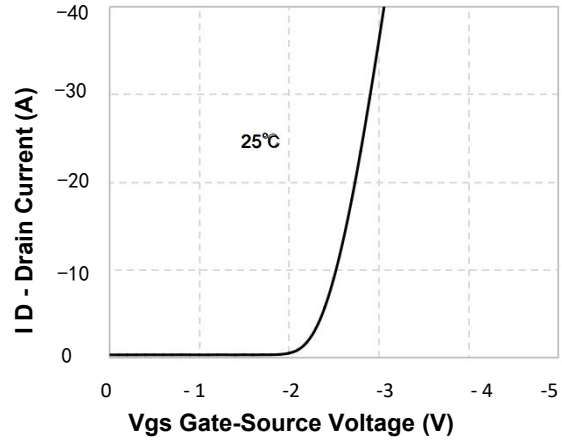
Note: ① Pulse Test : Pulse width  $\leq 300\mu s$ , Duty cycle  $\leq 2\%$  ;

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

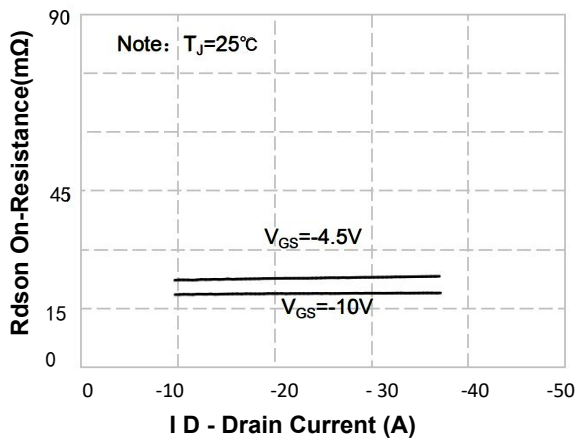
**P- Channel Typical Characteristics**



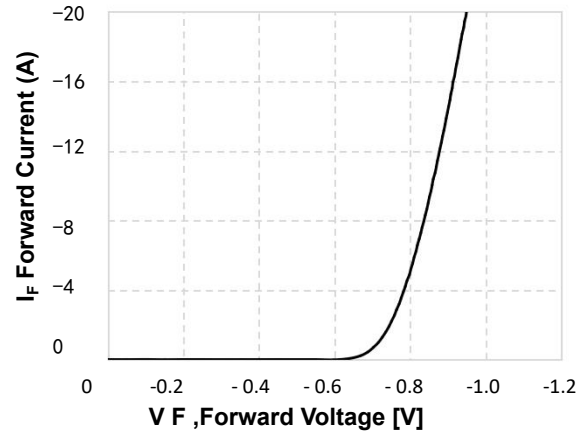
**Figure 1. On-Region Characteristics**



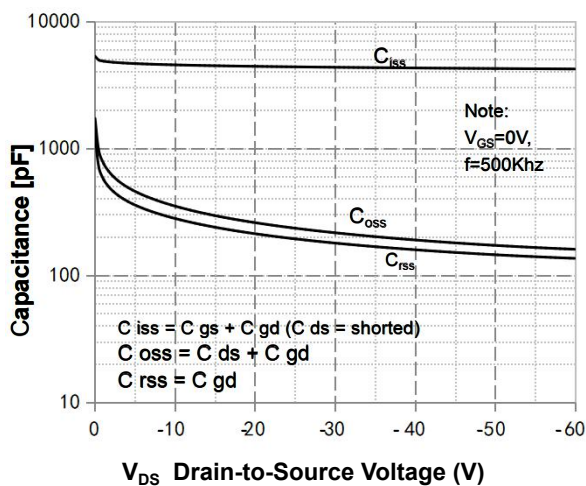
**Figure 2. Transfer Characteristics**



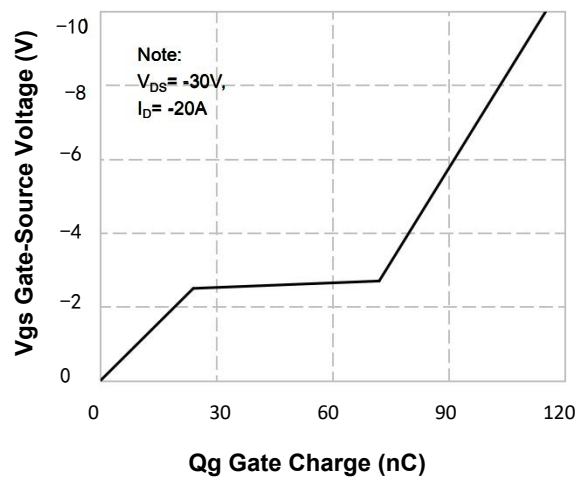
**Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage**



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

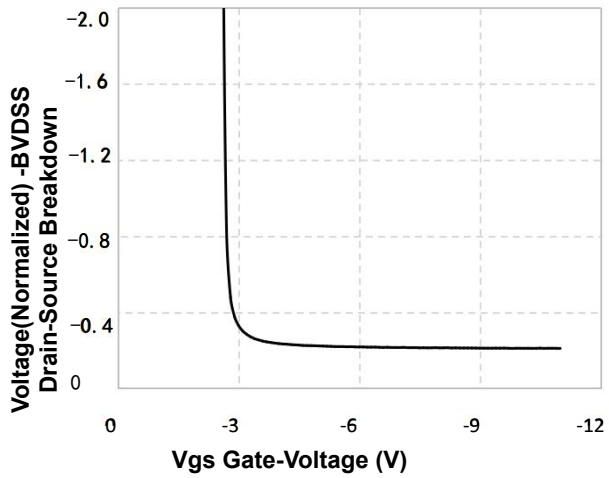


**Figure 5. Capacitance Characteristics**

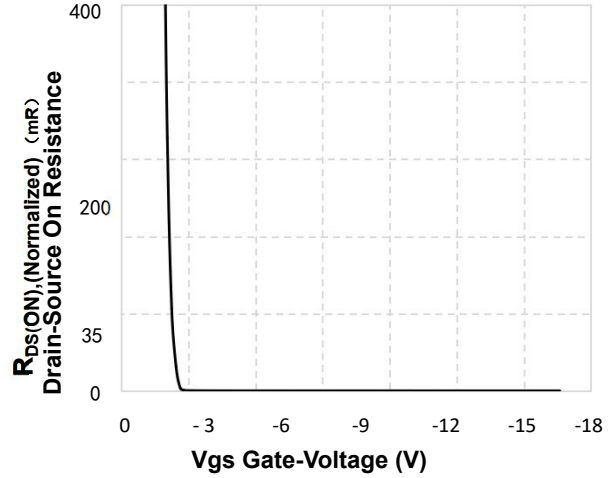


**Figure 6. Gate Charge Characteristics**

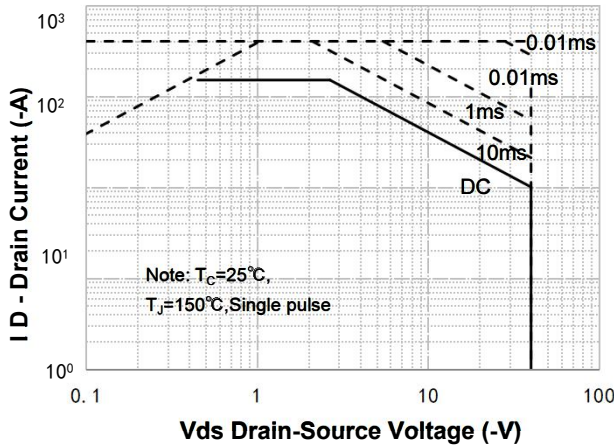
**P- Channel Typical Characteristics (Continued)**



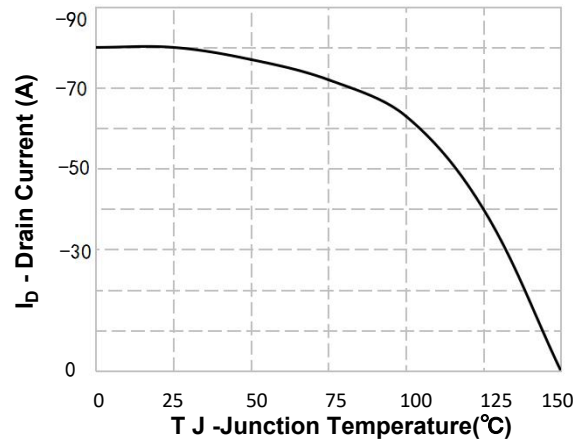
**Figure 7. Breakdown Voltage Variation vs Gate-Voltage**



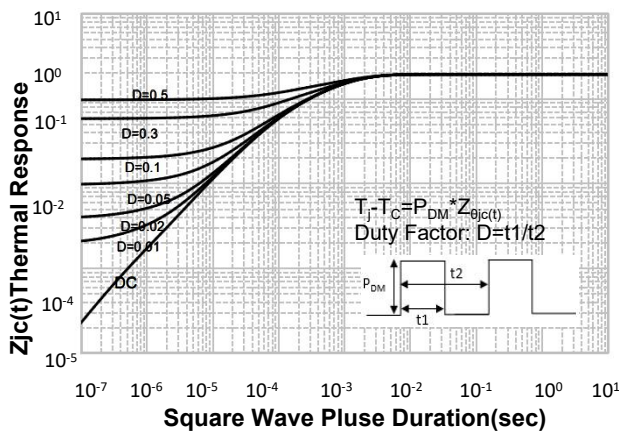
**Figure 8. On-Resistance Variation vs Gate Voltage**



**Figure 9. Maximum Safe Operating Area**

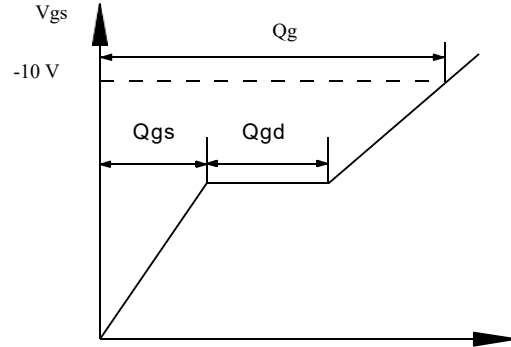
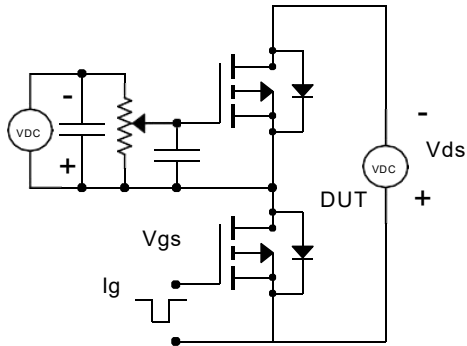


**Figure 10. Maximum PContinuous Drain Current vs Case Temperature**

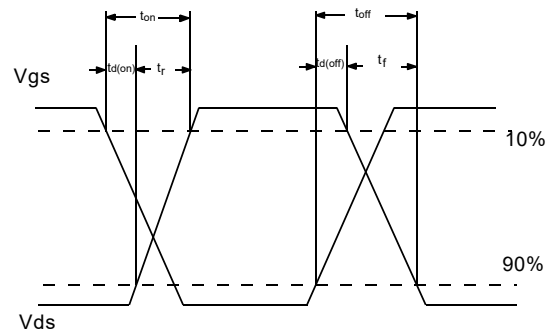
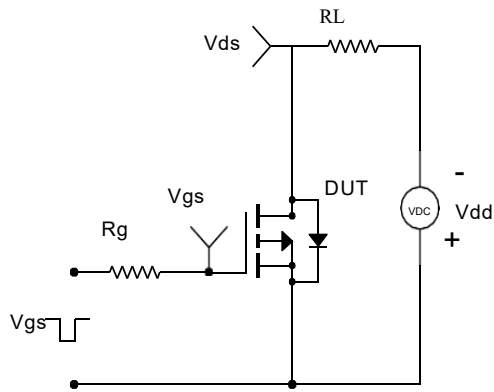


**Figure 11. Transient Thermal Response Curve**

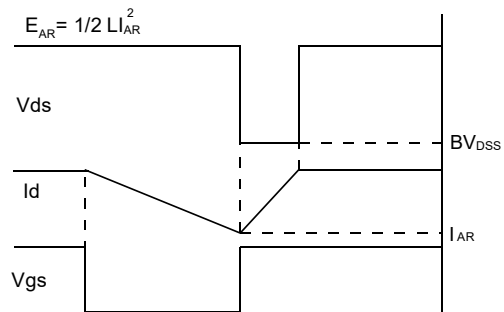
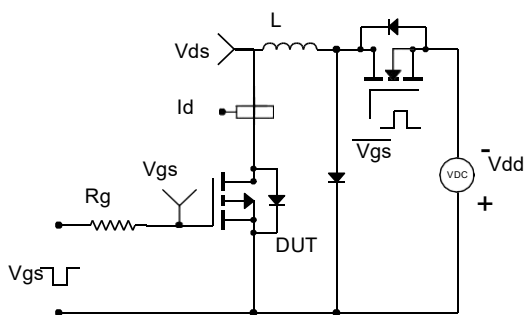
### Gate Charge Test Circuit & Waveform



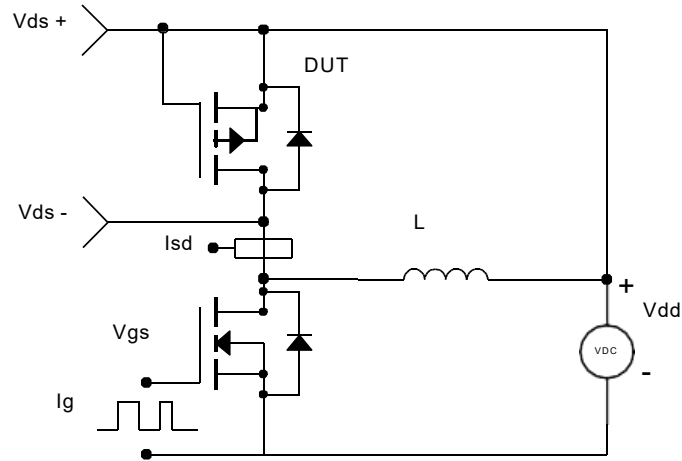
### Resistive Switching Test Circuit & Waveforms



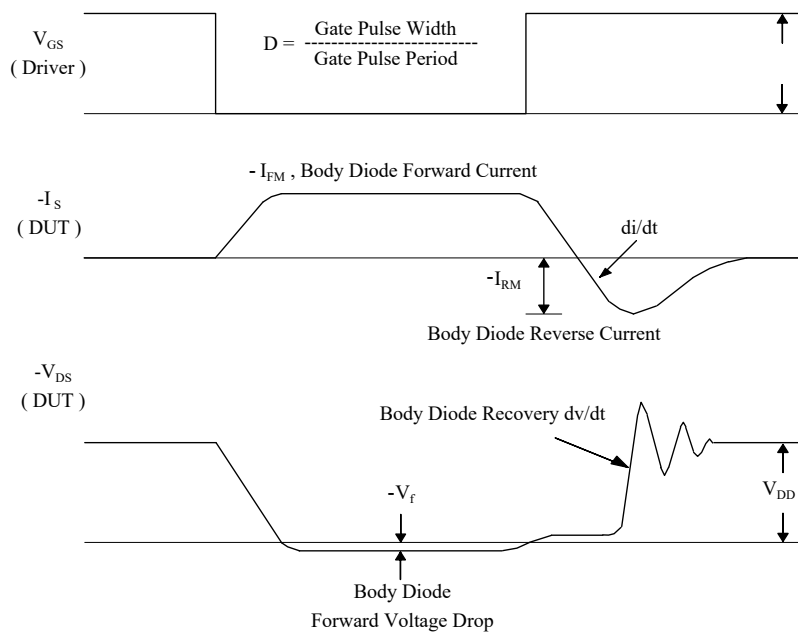
### Unclamped Inductive Switching Test Circuit & Waveforms



### Peak Diode Recovery dv/dt Test Circuit & Waveforms

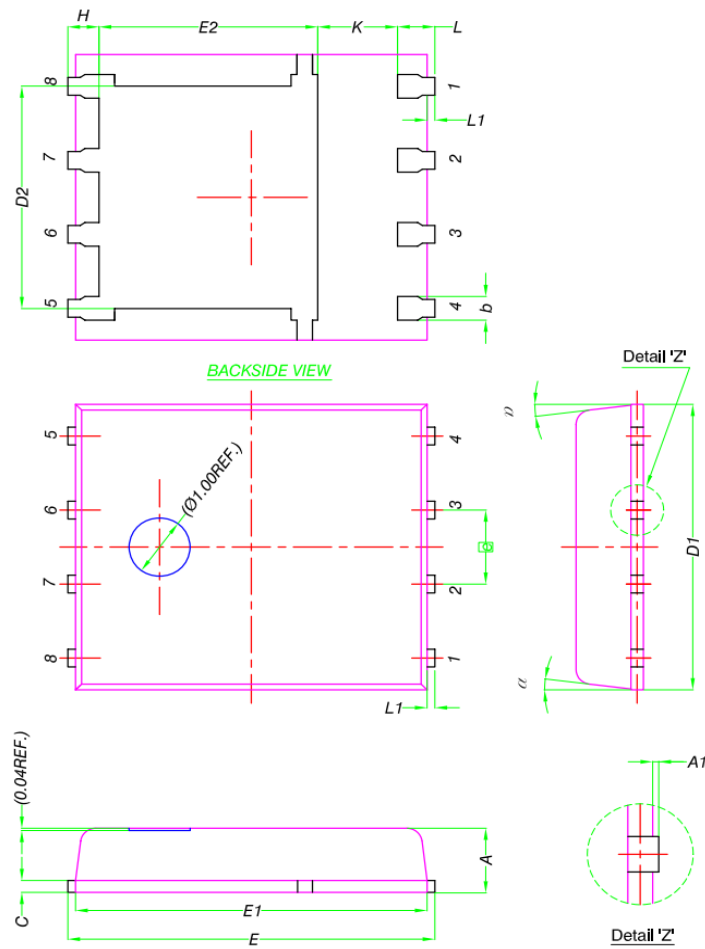


- $dv/dt$  controlled by  $R_G$
- $I_{SD}$  controlled by pulse period



**•Dimensions (DFN5×6)**

Unit: mm



DIM.	MILLIMETERS		
	MIN.	NOM.	MAX.
A	0.90	1.00	1.10
A1	0	-	0.05
b	0.33	0.41	0.51
C	0.20	0.25	0.30
D1	4.80	4.90	5.00
D2	3.61	3.81	3.96
E	5.90	6.00	6.10
E1	5.70	5.75	5.80
E2	3.38	3.58	3.78
$e$	1.27 BSC		
H	0.41	0.51	0.61
K	1.10	-	-
L	0.51	0.61	0.71
L1	0.06	0.13	0.20
$\alpha$	0°	-	12°