

• General Description

The CH20N06D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

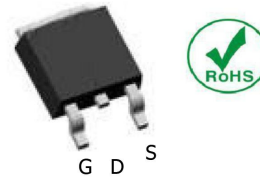
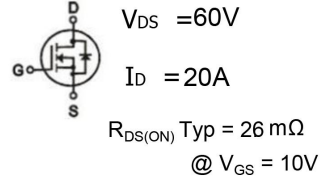
• Features

- 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



TO-252

• Ordering Information:

Part NO.	CH20N06D
Marking	CH20N06D
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

• Absolute Maximum Ratings ($T_c = 25^\circ\text{C}$)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	20	V
Continuous Drain Current	$I_{D@TC=25^\circ\text{C}}$	20	A
	$I_{D@TC=75^\circ\text{C}}$	15	A
	$I_{D@TC=100^\circ\text{C}}$	13	A
Pulsed Drain Current	I_{DM}	80	A
Total Power Dissipation($TC=25^\circ\text{C}$)	$P_{D@TC=25^\circ\text{C}}$	40	W
Total Power Dissipation($TA=100^\circ\text{C}$)	$P_{D@TC=100^\circ\text{C}}$	23	W
Operating Junction Temperature	T_J	-55 to 175	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55 to 175	$^\circ\text{C}$
Single Pulse Avalanche Energy@ $L=0.1\text{mH}$	E_{AS}	100	mJ
Avalanche Current@ $L=0.1\text{mH}$	I_{AS}	55	A

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	2.7		$^{\circ}\text{C/W}$
Thermal resistance, junction - ambient	R_{thJA}	-	-	100	$^{\circ}\text{C/W}$
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	125	$^{\circ}\text{C}$

•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	1.6	2.5	V
Drain-Source Leakage Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 12V, V_{DS}=0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=10A$		26	33	m Ω
		$V_{GS}=4.5V, I_D=5A$		33	45	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=15V, I_D=10A$		18		S
Source-drain voltage	V_{SD}	$I_S=20A$			1.20	V

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	$f = 1\text{MHz}$	-	860	-	pF
Output capacitance	C_{oss}		-	62	-	
Reverse transfer capacitance	C_{rss}		-	51	-	

•Gate Charge characteristics($T_a = 25^{\circ}\text{C}$)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DS}=30V$	-	20	-	nC
Gate - Source charge	Q_{gs}	$I_D = 10A$	-	3.7	-	
Gate - Drain charge	Q_{gd}	$V_{GS} = 10V$	-	5.3	-	

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

Typical Performance Characteristics

Figure 1: Output Characteristics

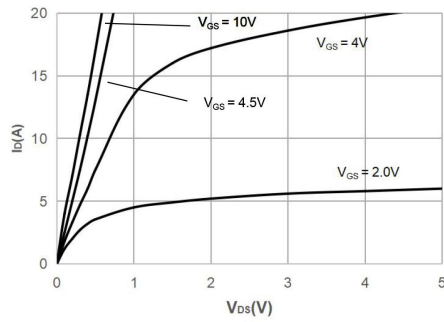


Figure 2: Typical Transfer Characteristics

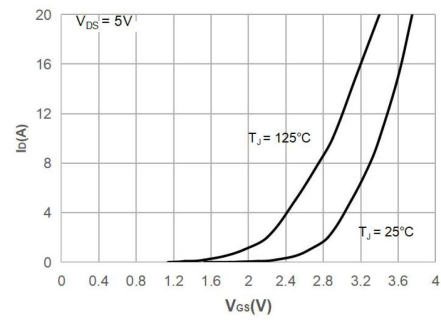


Figure 3: On-resistance vs. Drain Current

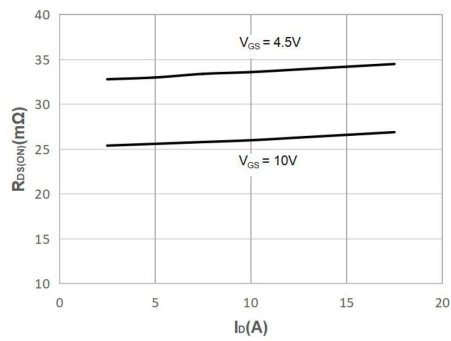


Figure 4: Body Diode Characteristics

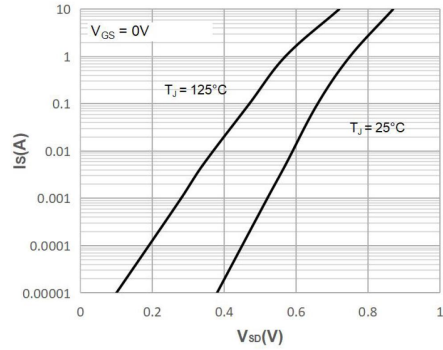


Figure 5: Gate Charge Characteristics

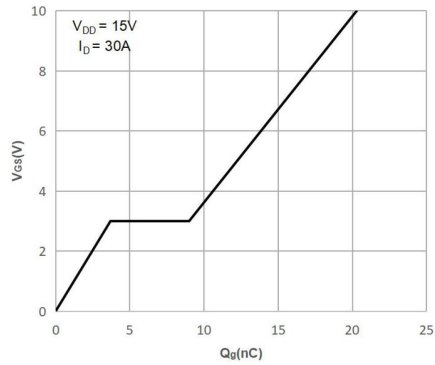
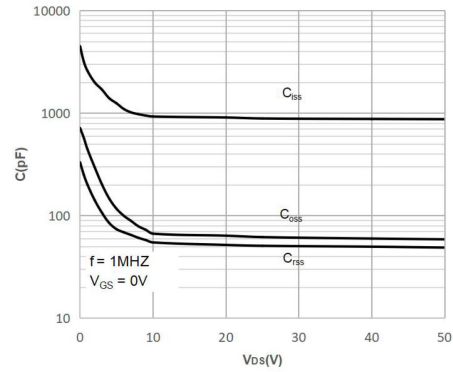


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

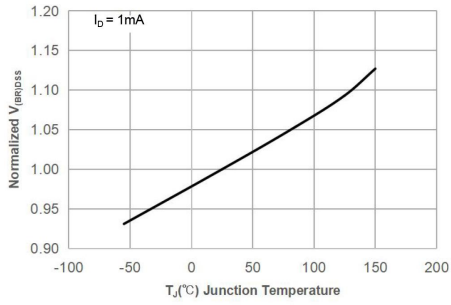


Figure 8: Normalized on Resistance vs. Junction Temperature

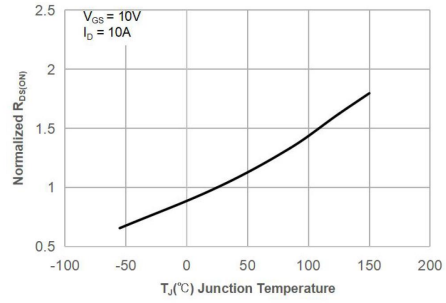


Figure 9: Maximum Safe Operating Area

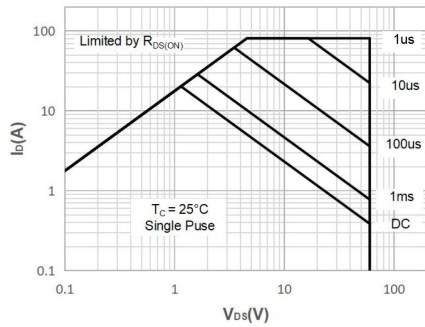


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

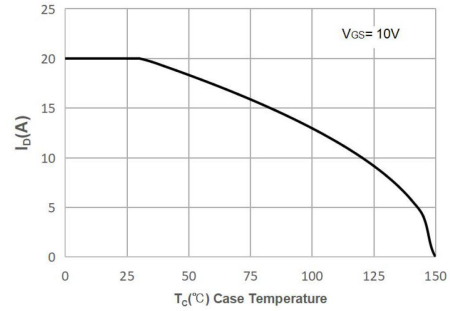


Figure 11: Normalized Maximum Transient Thermal Impedance

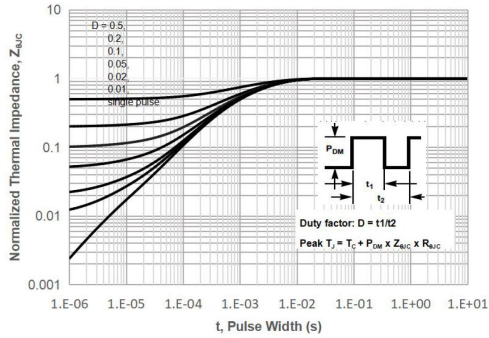
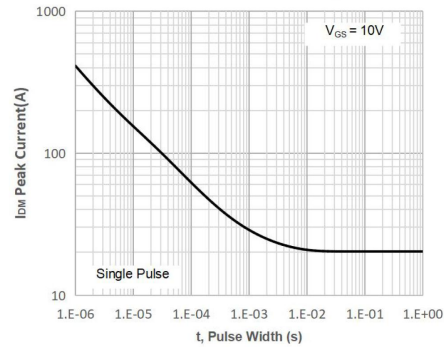


Figure 12: Peak Current Capacity



Test Circuit

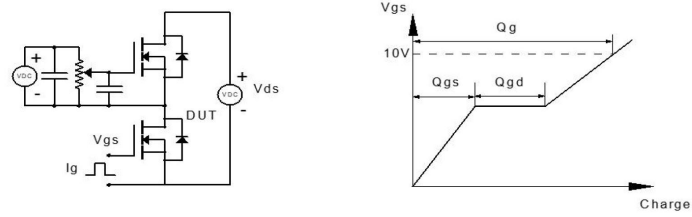


Figure 1: Gate Charge Test Circuit & Waveform

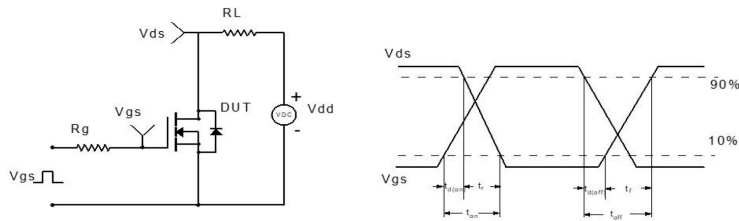


Figure 2: Resistive Switching Test Circuit & Waveform

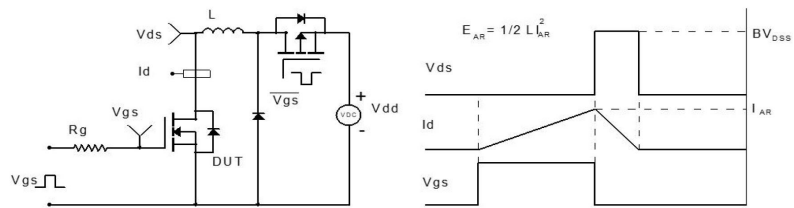


Figure 3: Unclamped Inductive Switching Test Circuit & Waveform

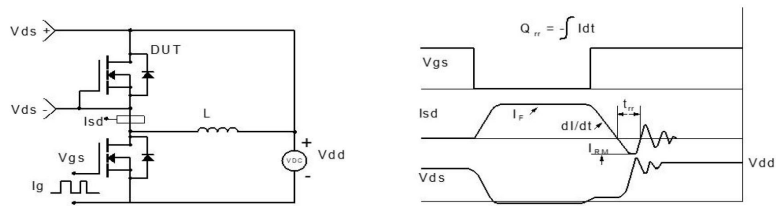
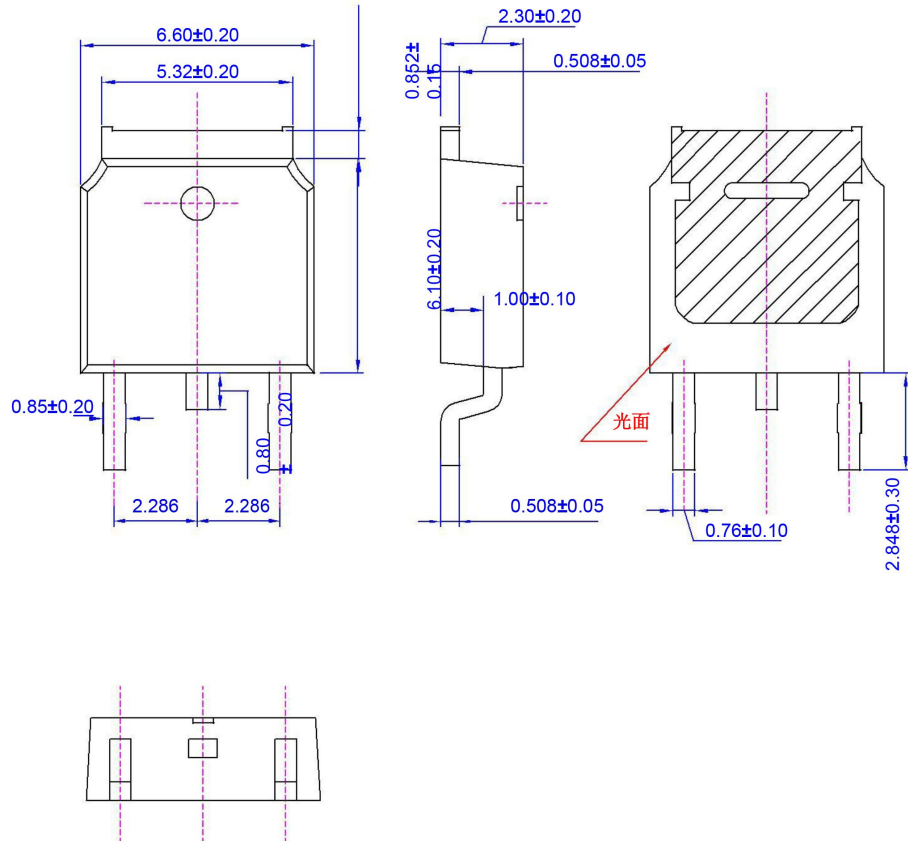


Figure 4: Diode Recovery Test Circuit & Waveform

● Dimensions (TO-252)



注:

1. 塑封体未标注为光面 $Ra=0.1$; 亚光面 $Ra=0.8$
2. 未注公差 ± 0.15 , 未标注圆角 $R_{max}=0.25$
3. 塑封体无缺损、缩孔、裂纹、气泡等不良缺陷
4. 标注单位 mm