

General Description

The CH06N04D 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.

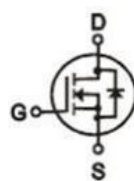
Features

- 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



$$V_{DS} = 40V$$

$$R_{DS(ON)} = 7m\Omega$$

$$I_D = 80A$$



TO-252

Ordering Information:

Part NO.	CH06N04D
Marking	CH06N04D
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	20	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	80	A
	$I_{D@TC=75^\circ C}$	60	A
	$I_{D@TC=100^\circ C}$	40	A
Pulsed Drain Current	I_{DM}	80	A
Total Power Dissipation($TC=25^\circ C$)	$P_D@TC=25^\circ C$	60	W
Total Power Dissipation($TA=100^\circ C$)	$P_D@TC=100^\circ C$	20	W
Operating Junction Temperature	T_J	-55 to 175	$^\circ C$
Storage Temperature	T_{STG}	-55 to 175	$^\circ C$
Single Pulse Avalanche Energy@ $L=0.1mH$	E_{AS}	47	mJ
Avalanche Current@ $L=0.1mH$	I_{AS}	55	A

•Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	3.72		°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	30	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	125	°C

•Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	40			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}	$V_{DS}=100V, V_{GS}=0V$			1.0	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=1A$		6.0	8.0	m Ω
		$V_{GS}=4.5V, I_D=1A$		9.0	12	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=15V, I_D=10A$		15		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}	$f = 1MHz$	-	1102	-	pF
Output capacitance	C_{oss}		-	201	-	
Reverse transfer capacitance	C_{rss}		-	194	-	

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

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	$V_{DS}=20V$	-	24	-	nC
Gate - Source charge	Q_{gs}	$I_D=10A$	-	4.1	-	
Gate - Drain charge	Q_{gd}	$V_{GS}=10V$	-	5.5	-	

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

Fig. 1 Power Derating

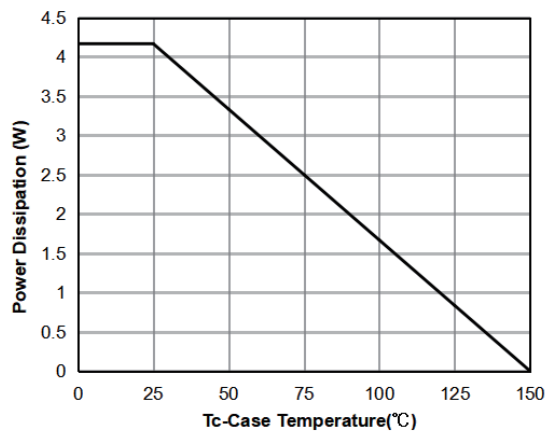


Fig. 2 Maximum Drain Current vs. Case Temperature

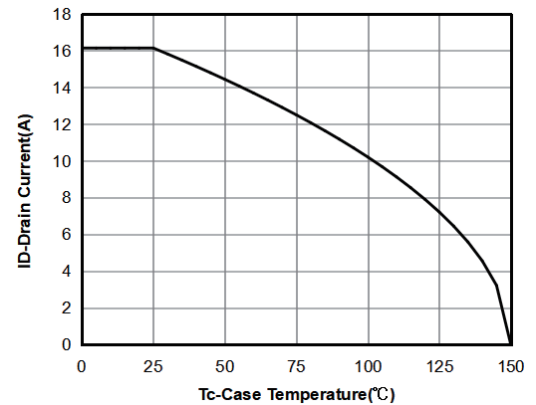


Fig. 3 Output Characteristics

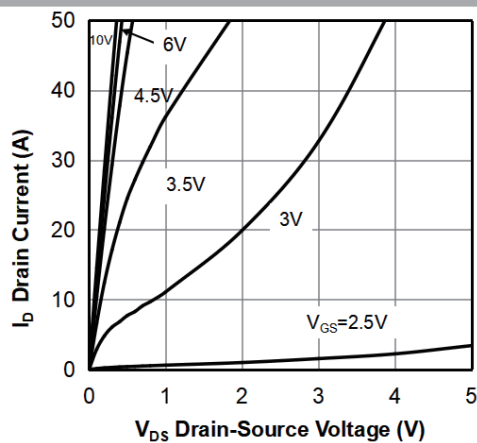


Fig. 4 Transfer Characteristics

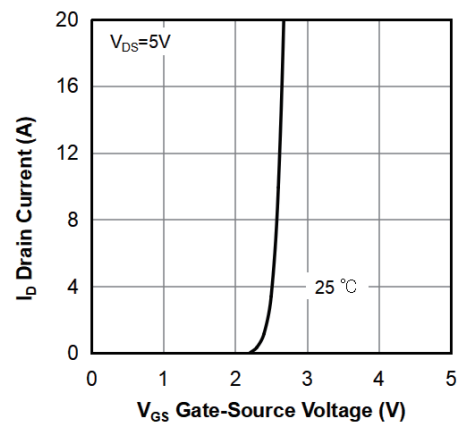


Fig. 5 On-Resistance vs. Drain Current and Gate Voltage

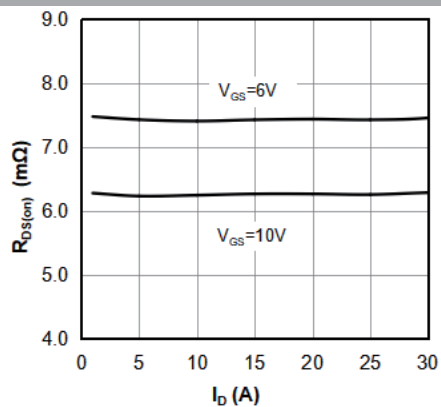


Fig. 6 On-Resistance vs. Junction Temperature/ Normalized On-Resistance

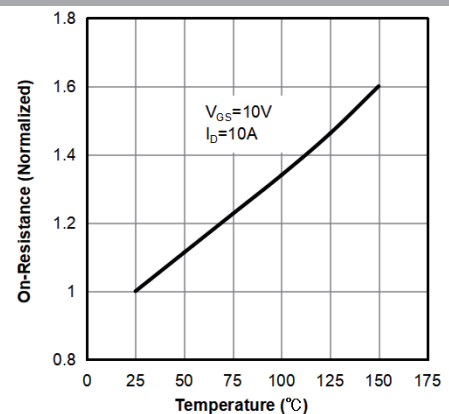


Fig. 7 On-Resistance vs. Gate-Source Voltage

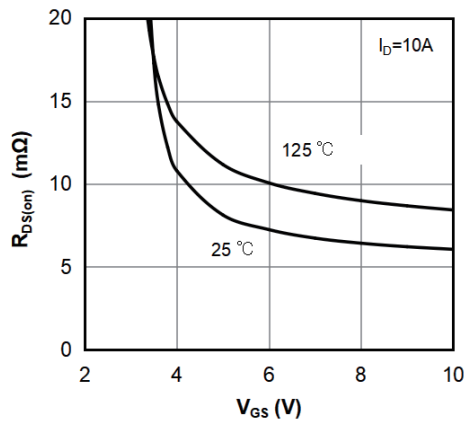


Fig. 8 Body-Diode Characteristics

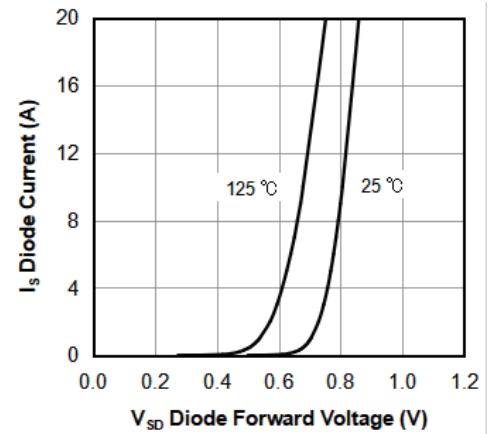


Fig. 9 Capacitance Characteristics

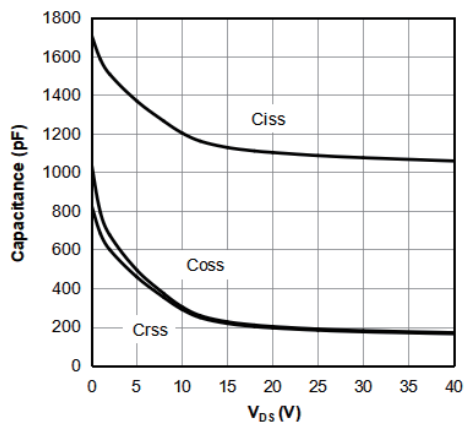


Fig. 10 Gate Charge Characteristics

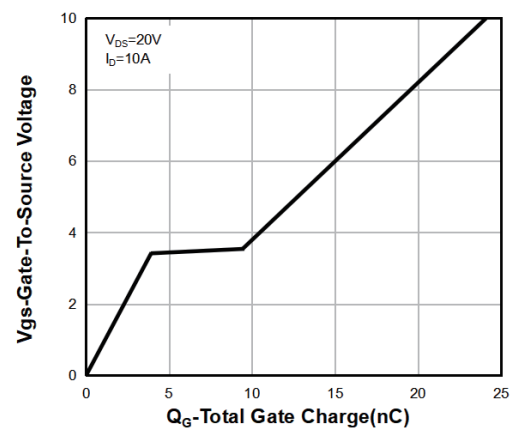


Fig. 11 Safe Operation Area

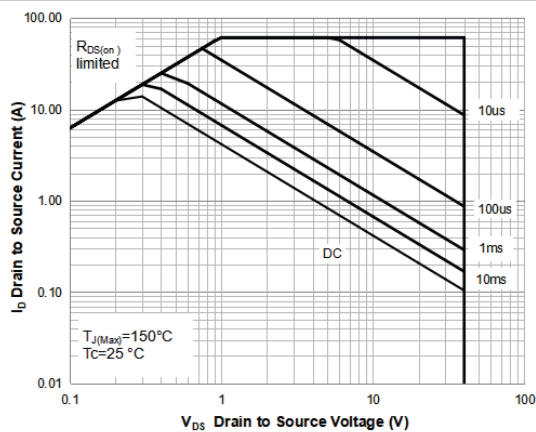
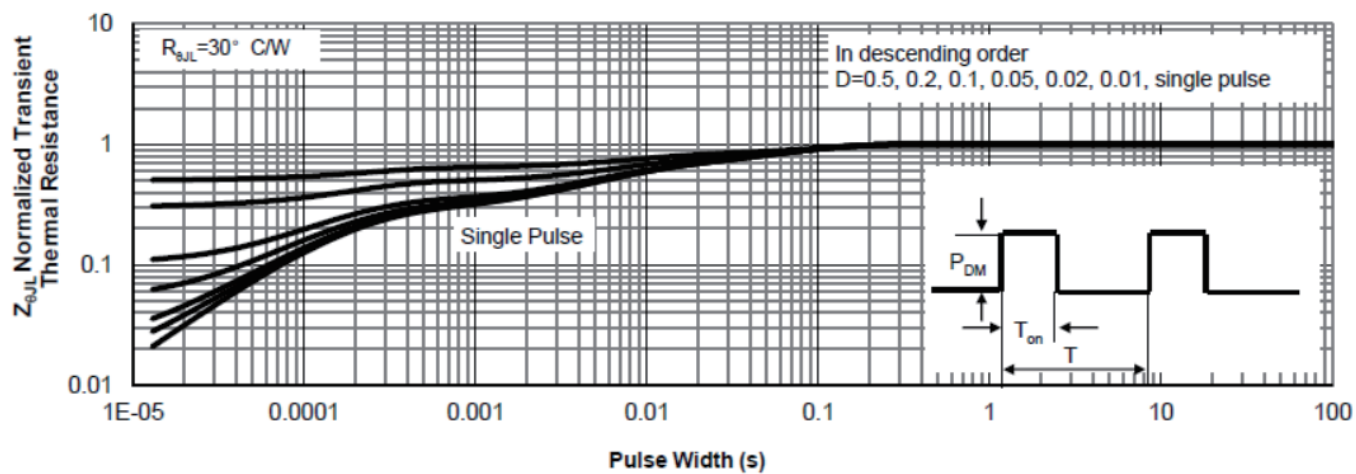


Fig. 12 Normalized Maximum Transient thermal impedance



Test Circuit

Fig.1-1 Switching times test circuit

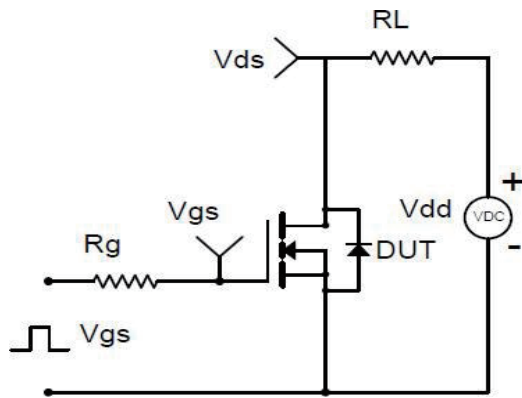


Fig.1-2 Switching Waveform

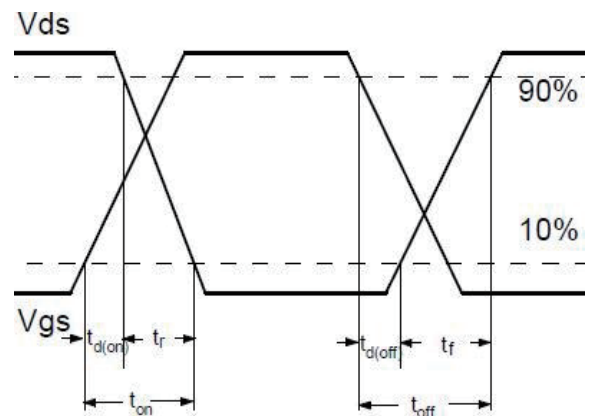


Fig.2-1 Gate charge test circuit

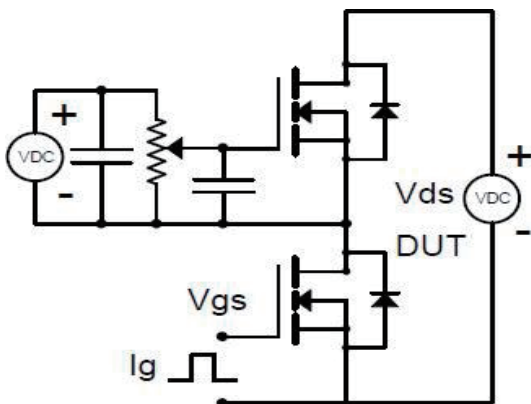


Fig.2-2 Gate charge waveform

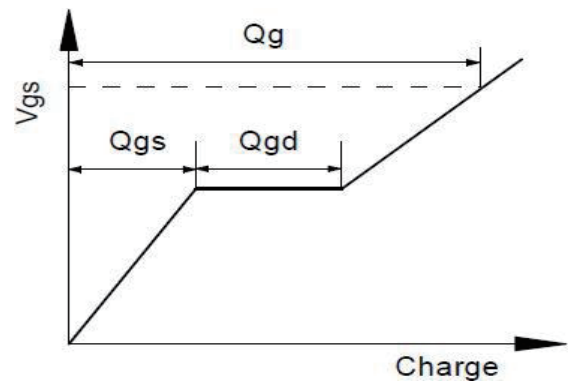


Fig.3-1 Avalanche test circuit

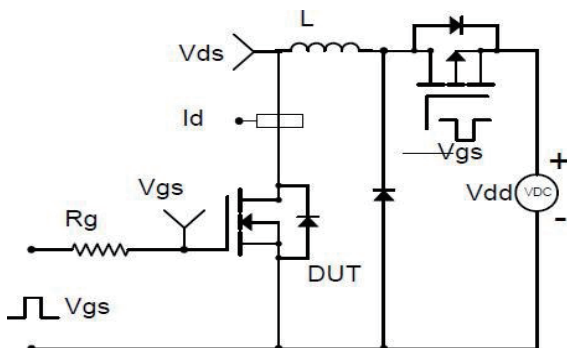
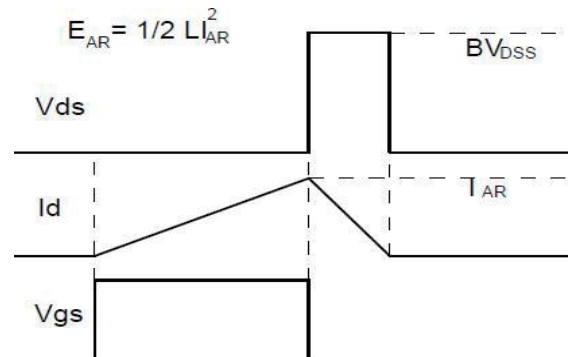
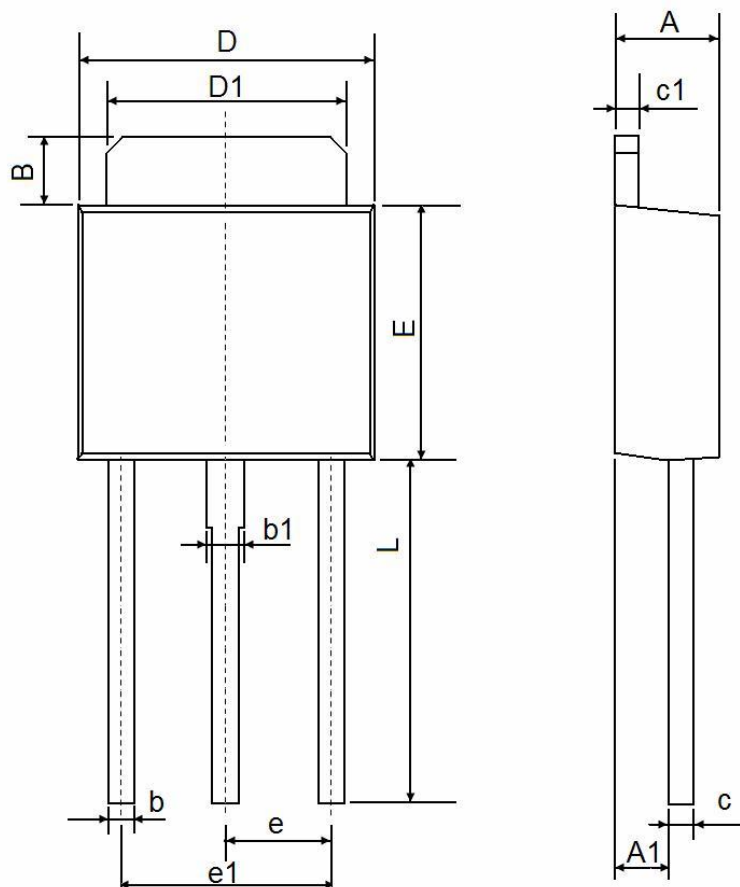


Fig.3-2 Avalanche waveform



TO-251 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311

● **Dimensions (TO-252)**

