

### General Description

The CH30N06A 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.

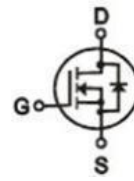
### Features

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

### Product Summary



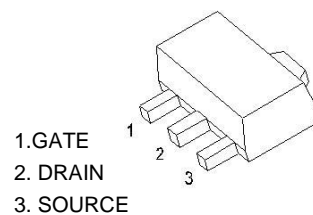
$$V_{DS} = 60V$$

$$R_{DS(ON)} = 23m\Omega$$

$$I_D = 30A$$



SOT-89-3L



### Ordering Information:

Part NO.	CH30N06A
Marking	CH30N06A
Packing Information	REEL TAPE
Basic ordering unit (pcs)	1000

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

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	20	V
Continuous Drain Current	$I_{D@TC=25^\circ C}$	30	A
	$I_{D@TC=75^\circ C}$	25	A
	$I_{D@TC=100^\circ C}$	20	A
Pulsed Drain Current	$I_{DM}$	120	A
Total Power Dissipation( $TC=25^\circ C$ )	$P_D@TC=25^\circ C$	45	W
Total Power Dissipation( $TA=100^\circ C$ )	$P_D@TC=100^\circ C$	30	W
Operating Junction Temperature	$T_J$	-55 to 175	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 175	$^\circ C$
Single Pulse Avalanche Energy@ $L=0.1mH$	$E_{AS}$	120	mJ
Avalanche Current@ $L=0.1mH$	$I_{AS}$	50	A

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R <sub>thJC</sub>	-	2.7		°C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	100	°C/W
Soldering temperature, wavesoldering for 10s	T <sub>sold</sub>	-	-	125	°C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	60			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250uA	1	1.6	2.5	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 20V, V <sub>GS</sub> = 0V			1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±12V, V <sub>DS</sub> = 0V			± 100	nA
Static Drain-source On Resistance	R <sub>Ds(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		23	30	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 10A		29	40	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 10A		11		S
Source-drain voltage	V <sub>SD</sub>	I <sub>S</sub> = 20A			1.20	V

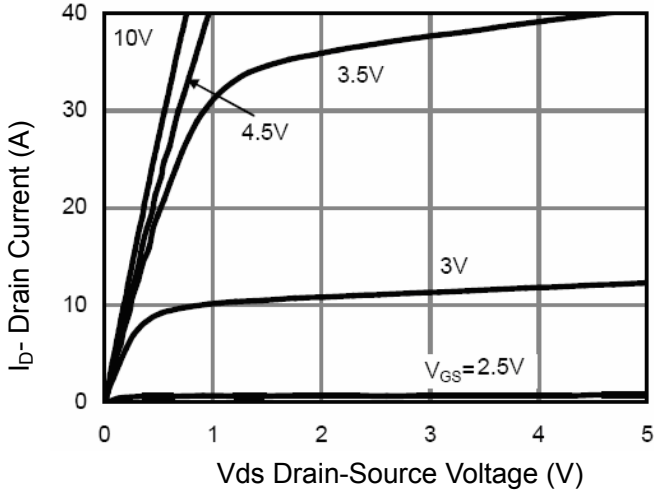
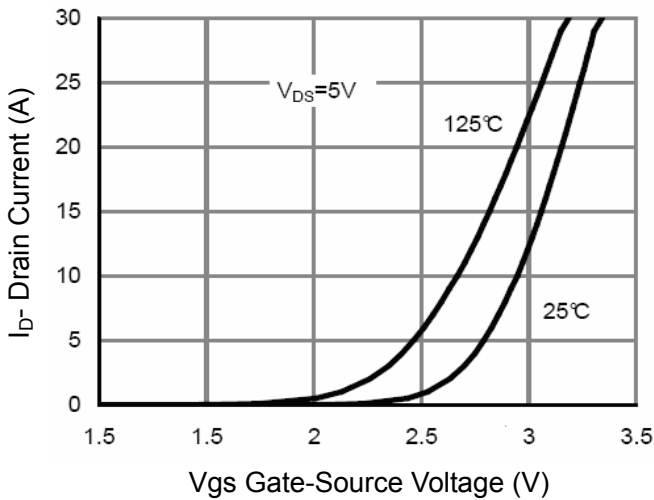
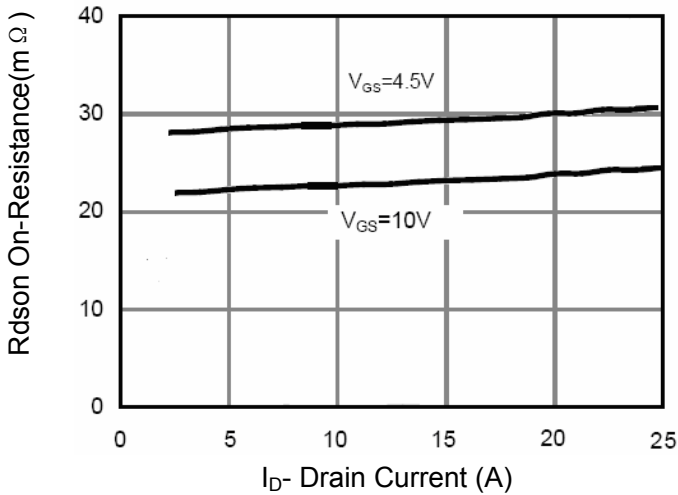
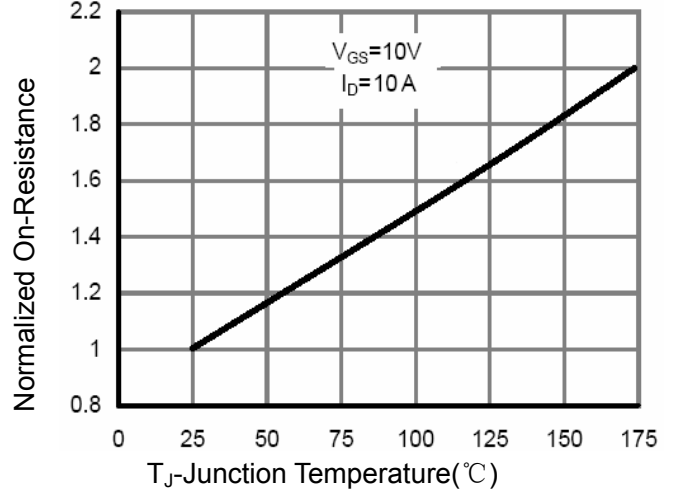
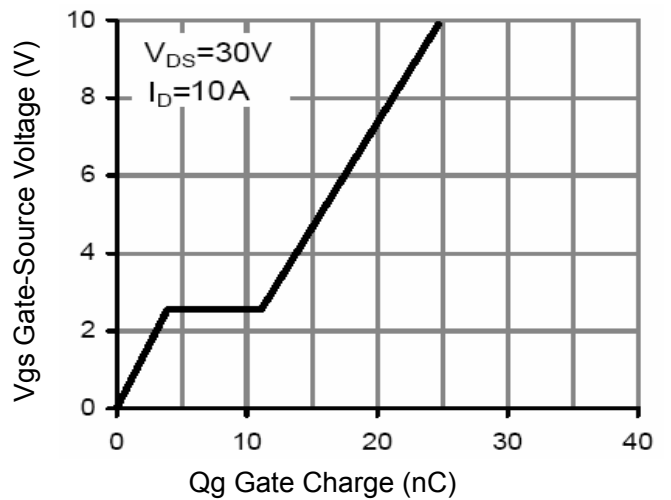
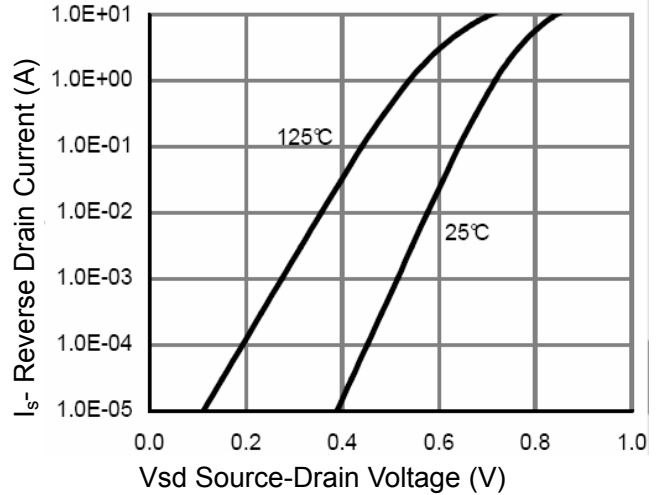
**•Electronic Characteristics**

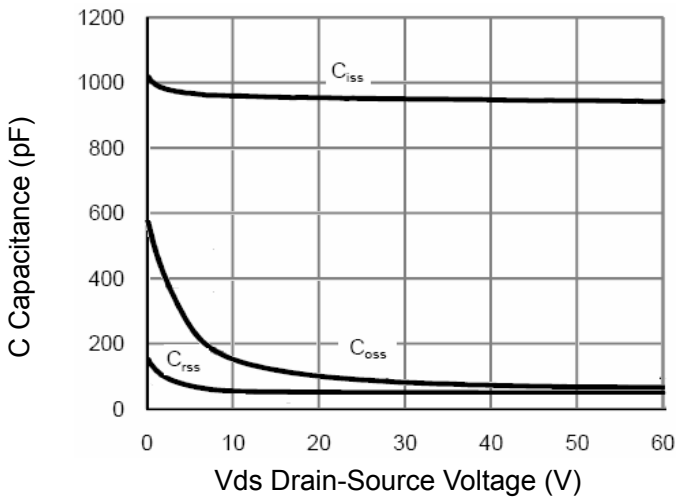
Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	f = 1MHz	-	1073	-	pF
Output capacitance	C <sub>oss</sub>		-	65.4	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	56.8	-	

**•Gate Charge characteristics(T<sub>a</sub> = 25°C)**

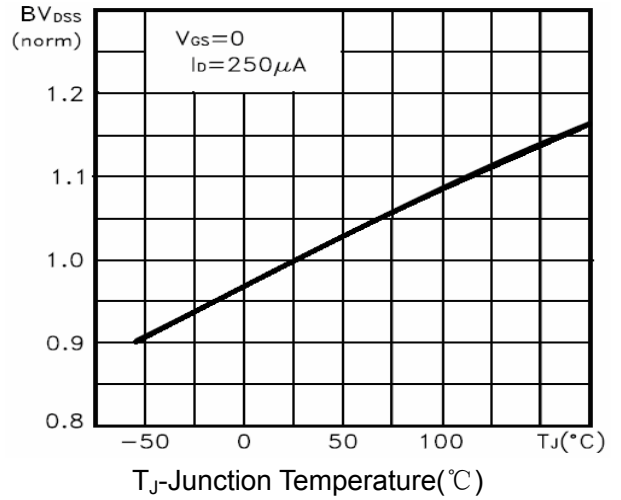
Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 30V	-	25	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 15A	-	4.5	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 10V	-	6.5	-	

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

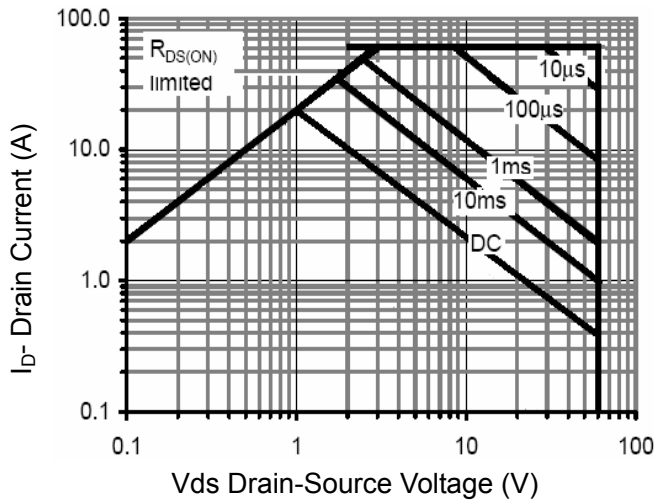
**Typical Electrical and Thermal Characteristics (Curves)**

**Figure 1 Output Characteristics**

**Figure 2 Transfer Characteristics**

**Figure 3 Rdson- Drain Current**

**Figure 4 Rdson-Junction Temperature**

**Figure 5 Gate Charge**

**Figure 6 Source- Drain Diode Forward**



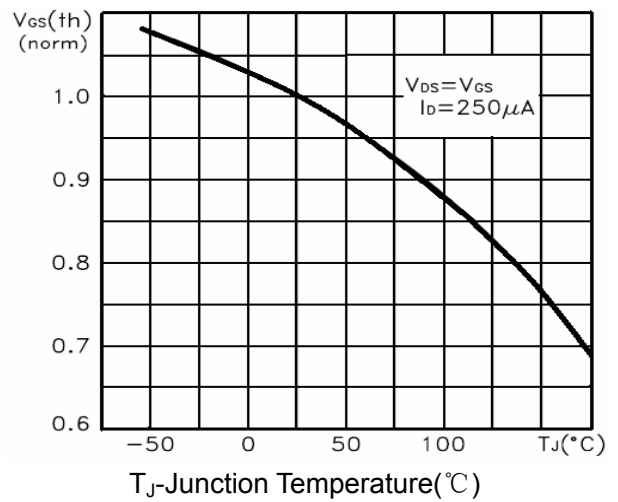
**Figure 7 Capacitance vs Vds**



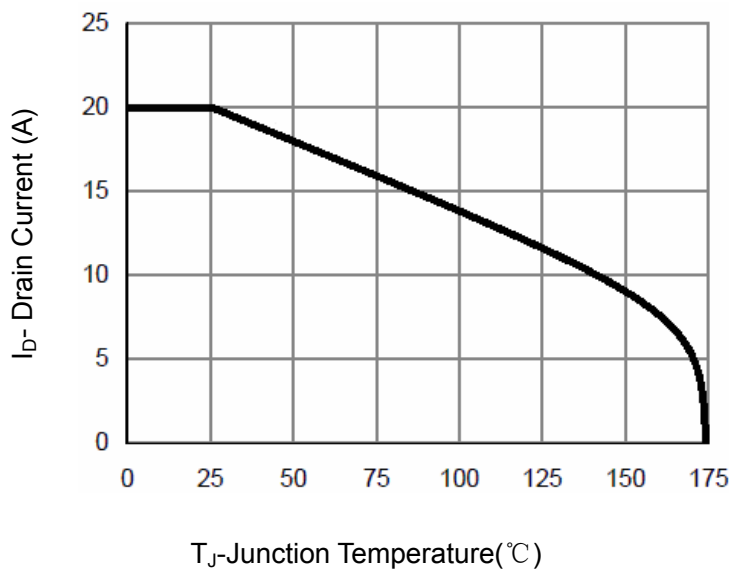
**Figure 9 BV<sub>DSS</sub> vs Junction Temperature**



**Figure 8 Safe Operation Area**



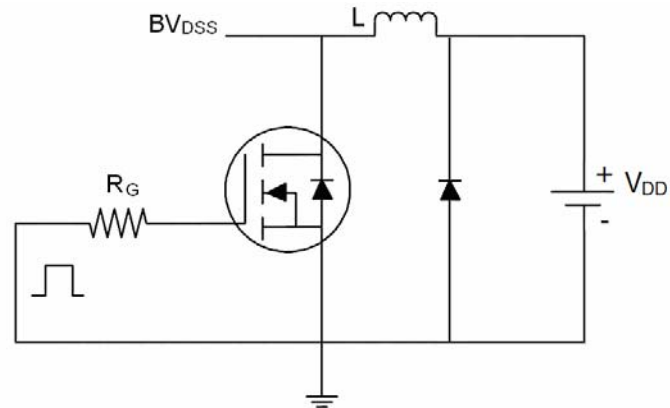
**Figure 10 V<sub>GS(th)</sub> vs Junction Temperature**



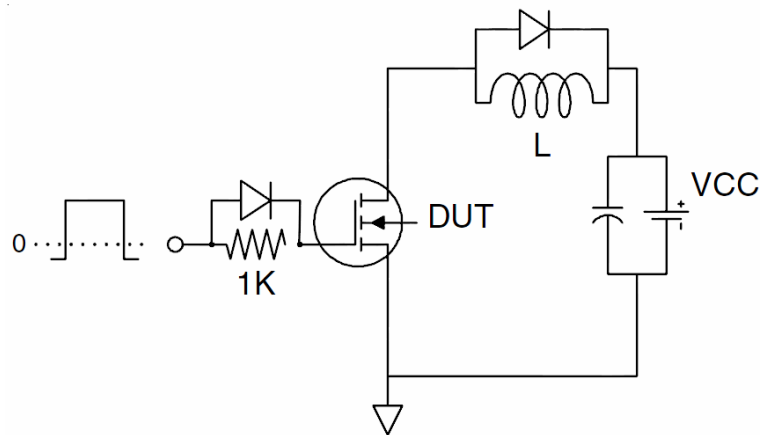
**Figure 11 Current De-rating**

### Test Circuit

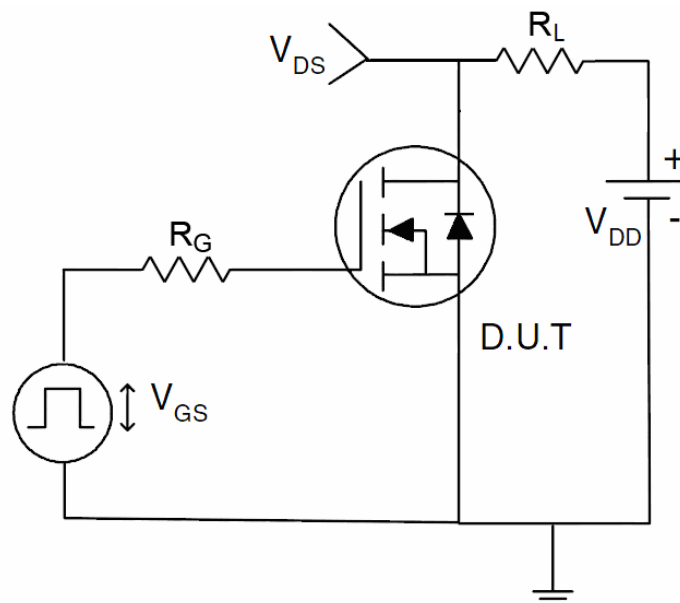
#### 1) $E_{AS}$ test Circuit

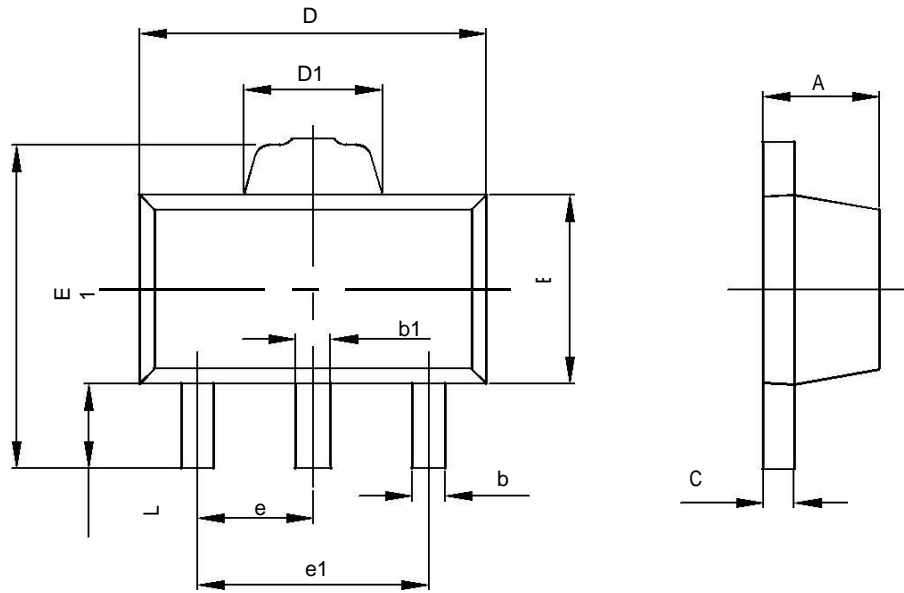


#### 2) Gate charge test Circuit



#### 3) Switch Time Test Circuit



**SOT-89-3L PACKAGE OUTLINE DIMENSIONS**


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.360	0.560	0.014	0.022
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.400	1.800	0.055	0.071
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500TYP		0.060TYP	
e1	2.900	3.100	0.114	0.122
L	0.900	1.100	0.035	0.043