

**• General Description**

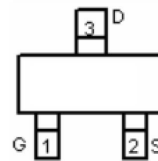
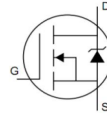
The CH5N06Q combines advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ . This device is ideal for load switch and battery protection applications.

**• 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**
 $V_{DS} = 60V$ 
 $R_{DS(ON)} = 27 m\Omega$ 
 $I_D = 5A$ 


SOT-23-3L


**• Ordering Information:**

Part NO.	CH5N06Q
Marking	6205
Packing Information	REEL TAPE
Basic ordering unit (pcs)	3000

**• Absolute Maximum Ratings (T<sub>c</sub> = 25°C)**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_{D@TC=25^{\circ}C}$	5.0	A
	$I_{D@TC=75^{\circ}C}$	3.5	A
	$I_{D@TC=100^{\circ}C}$	2.0	A
Pulsed Drain Current <sup>①</sup>	$I_{DM}$	20	A
Total Power Dissipation <sup>②</sup>	$P_D@T_C=25^{\circ}C$	1.4	W
Total Power Dissipation	$P_D@T_A=25^{\circ}C$	2.0	W
Operating Junction Temperature	$T_J$	-55 to 150	°C
Storage Temperature	$T_{STG}$	-55 to 150	°C

**●Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case <sup>②</sup>	R <sub>thJC</sub>	-	-	70	° C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	62.5	° C/W
Soldering temperature, wavesoldering for 10s	T <sub>sold</sub>	-	-	230	° 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	1.0		2.5	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V			1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> =±20V, 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> =5A		27	35	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =4A		31.5	50	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> =15V, I <sub>D</sub> =3A		3		s
Source-drain voltage	V <sub>SD</sub>	I <sub>S</sub> =5A			1.20	V

**●Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iss</sub>	V <sub>ds</sub> =25V V <sub>gs</sub> =0V f = 1MHz	-	1148	-	pF
Output capacitance	C <sub>oss</sub>		-	58.5	-	
Reverse transfer capacitance	C <sub>rss</sub>		-	49.4	-	

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

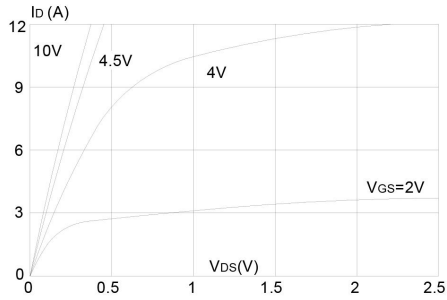
Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q <sub>g</sub>	V <sub>DD</sub> =30V	-	20.3	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 3A	-	3.7	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 4.5V	-	5.3	-	

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

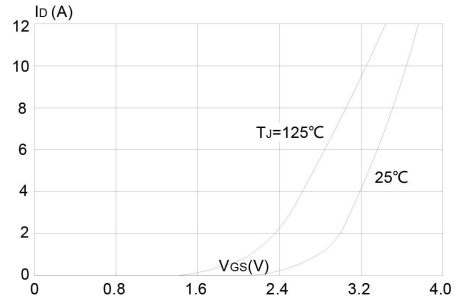
② Device mounted on FR-4 substrate PC board, 2oz copper, with thermal bias to bottom layer 1inch square copper plate;

### Typical Performance Characteristics

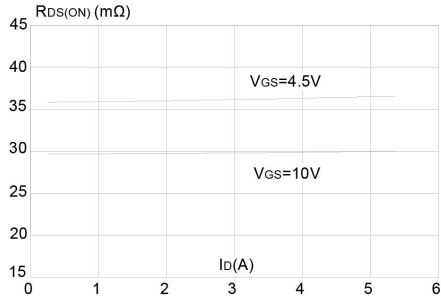
**Figure 1: Output Characteristics**



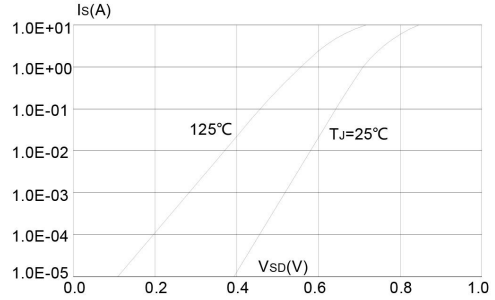
**Figure 2: Typical Transfer Characteristics**



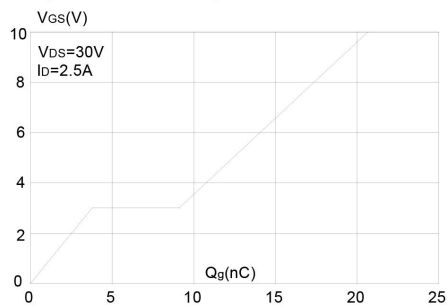
**Figure 3: On-resistance vs. Drain Current**



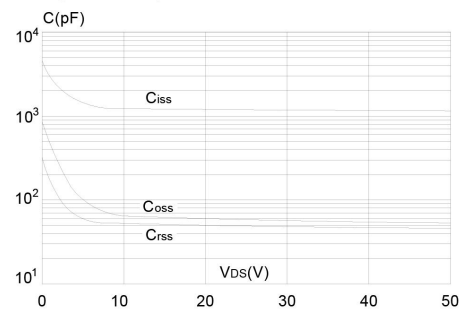
**Figure 4: Body Diode Characteristics**



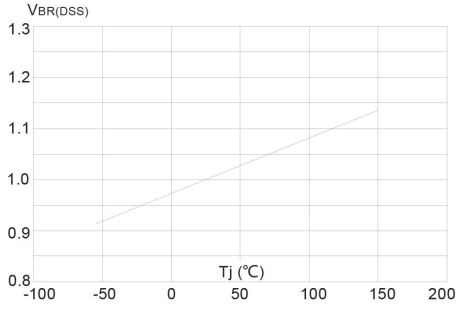
**Figure 5: Gate Charge Characteristics**



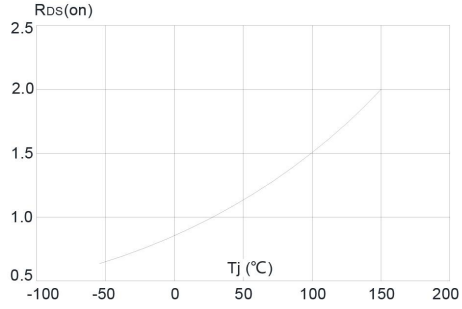
**Figure 6: Capacitance Characteristics**



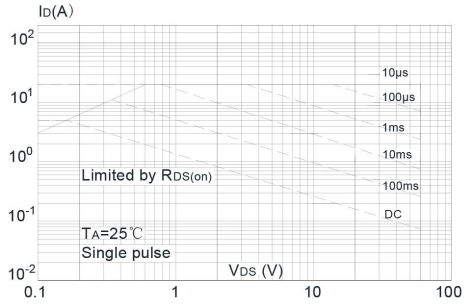
**Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**



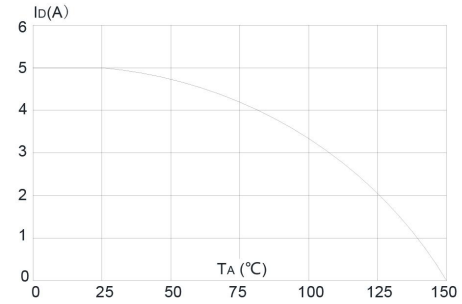
**Figure 8: Normalized on Resistance vs. Junction Temperature**



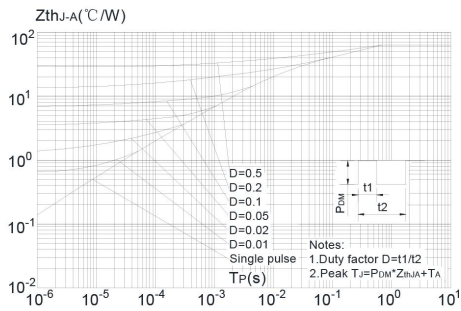
**Figure 9: Maximum Safe Operating Area**

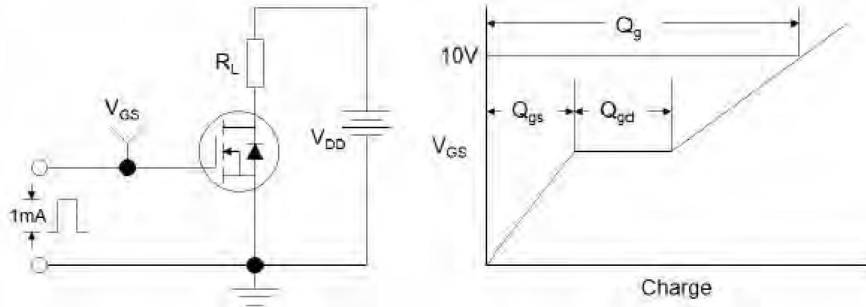
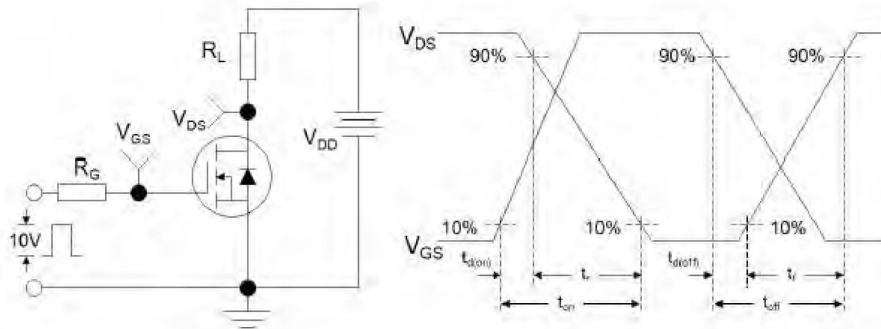
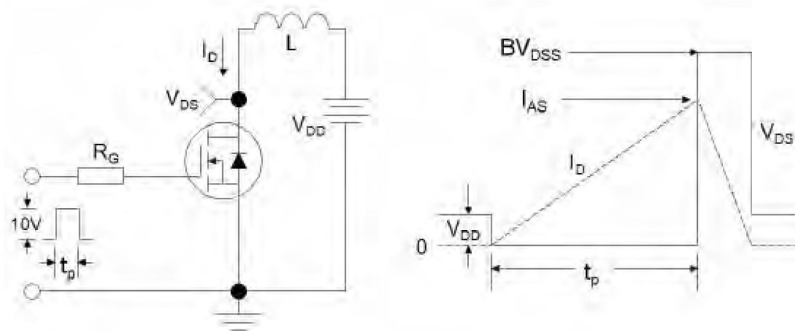


**Figure 10: Maximum Continuous Drain Current vs. Ambient Temperature**



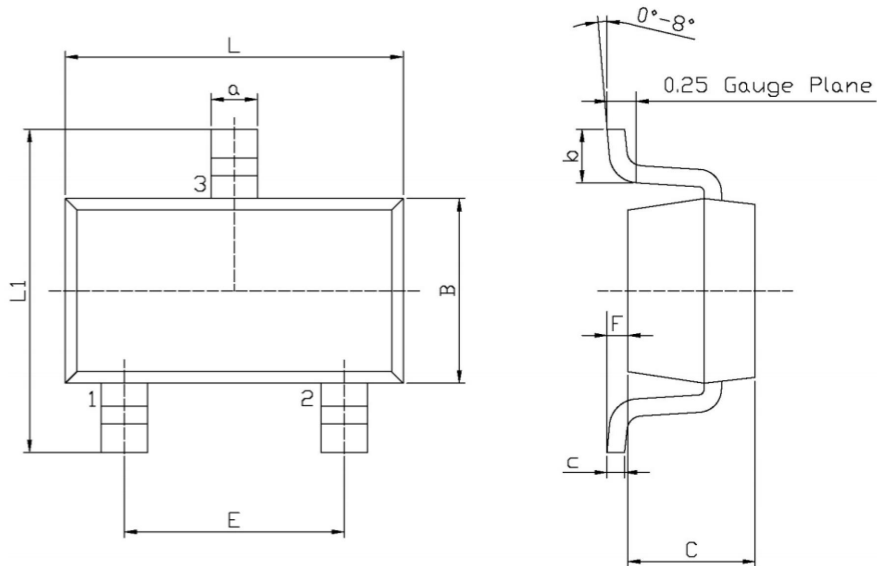
**Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Ambient**



**Test Circuit**

**Figure 1: Gate Charge Test Circuit & Waveform**

**Figure 2: Resistive Switching Test Circuit & Waveforms**

**Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms**

●Dimensions(SOT23-3)

Unit: mm



Unit: mm

Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.82	3.02	a	0.35	0.50
B	1.50	1.70	C	0.10	0.20
C	0.90	1.30	b	0.35	0.55
L1	2.60	3.00	F	0	0.15
E	1.80	2.00			