

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

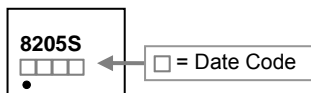
## DESCRIPTION

The STT8205S provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness. The TSOP-6 package is universally used for all commercial-industrial surface mount applications.

## FEATURES

- Low on-resistance
- Capable of 2.5V gate drive
- Low drive current

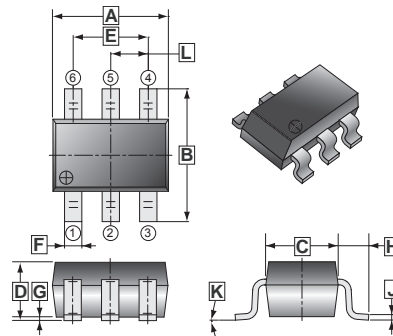
## MARKING CODE



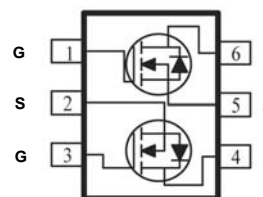
## PACKAGE INFORMATION

Package	MPQ	LeaderSize
TSOP-6	3K	7' inch

## TSOP-6



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0	0.10
B	2.60	3.00	H	0.60	REF.
C	1.40	1.80	J	0.12	REF.
D	1.10	MAX.	K	0°	10°
E	1.90	REF.	L	0.95	REF.
F	0.30	0.50			



## ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 10$	V
Continuous Drain Current <sup>3</sup>	$I_D$	$V_{GS}=4.5\text{V}, T_A = 25^\circ\text{C}$	6
		$V_{GS}=4.5\text{V}, T_A = 70^\circ\text{C}$	4.8
Pulsed Drain Current <sup>1</sup>	$I_{DM}$	20	A
Power Dissipation	$P_D$	1.14	W
Maximum Junction to Ambient <sup>3</sup>	$R_{\theta JA}$	110	$^\circ\text{C} / \text{W}$
Linear Derating Factor		0.01	$\text{W} / ^\circ\text{C}$
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$

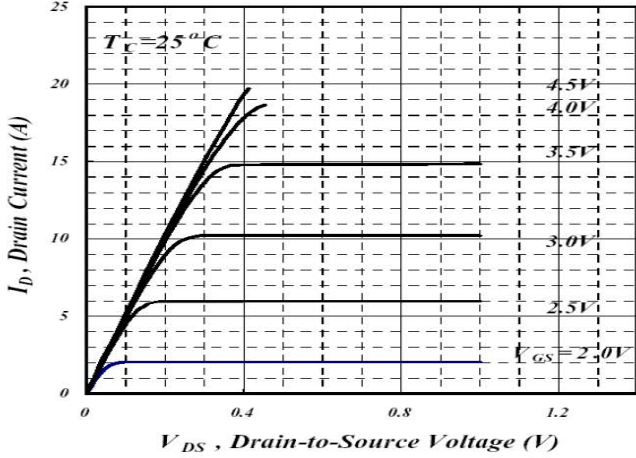
**ELECTRICAL CHARACTERISTICS** (T<sub>j</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test condition	
<b>Static</b>							
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	
Breakdown Voltage Temp. Coefficient	ΔBV <sub>DS</sub> /ΔT <sub>j</sub>	-	0.03	-	V / °C	Reference to 25°C, I <sub>D</sub> =1mA	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	1.5	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	
Forward Transfer Conductance	G <sub>fs</sub>	-	20	-	S	V <sub>DS</sub> =10V, I <sub>D</sub> =6A	
Gate-Body Leakage	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±10V	
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	T <sub>j</sub> = 25°C	-	-	1	μA	V <sub>DS</sub> =16V, V <sub>GS</sub> =0
		T <sub>j</sub> = 75°C	-	-	25	μA	V <sub>DS</sub> =16V, V <sub>GS</sub> =0
Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	28	mΩ	V <sub>GS</sub> =4.5V, I <sub>D</sub> =6A	
		-	-	38		V <sub>GS</sub> =2.5V, I <sub>D</sub> =5.2A	
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	23	-	nC	I <sub>D</sub> =6A V <sub>DS</sub> =20V V <sub>GS</sub> =5V	
Gate-Source Charge	Q <sub>gs</sub>	-	4.5	-			
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	7	-			
Turn-On Delay Time <sup>2</sup>	T <sub>d(on)</sub>	-	30	-	nS	V <sub>DS</sub> =10V I <sub>D</sub> =1A V <sub>GS</sub> =5V R <sub>G</sub> =6Ω R <sub>D</sub> =10Ω	
Rise Time	T <sub>r</sub>	-	70	-			
Turn-Off Delay Time	T <sub>d(off)</sub>	-	40	-			
Fall Time	T <sub>f</sub>	-	65	-			
Input Capacitance	C <sub>iss</sub>	-	1035	-	pF	V <sub>GS</sub> =0 V <sub>DS</sub> =20V f=1.0MHz	
Output Capacitance	C <sub>oss</sub>	-	320	-			
Reverse Transfer Capacitance	C <sub>rss</sub>	-	150	-			
<b>Source-Drain Diode</b>							
Forward On Voltage <sup>2</sup>	V <sub>DS</sub>	-	-	1.2	V	I <sub>S</sub> =1.7A, V <sub>GS</sub> =0	

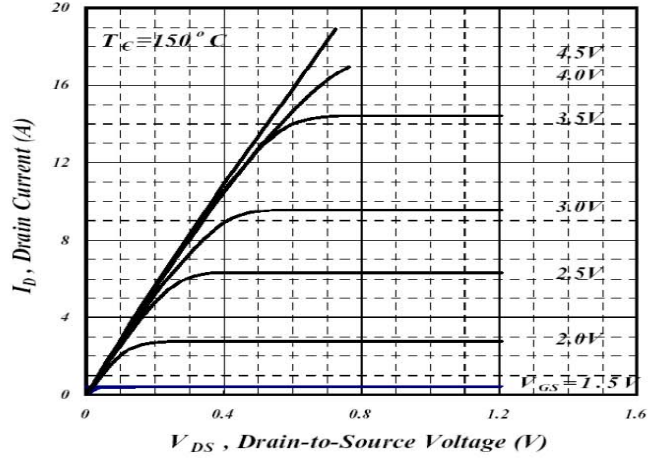
Notes:

- 1 Pulse width limited by Max. junction temperature.
- 2 Pulse width ≤ 300us, duty cycle ≤ 2%.
- 3 Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; t ≤ 5 sec. 180°C/W when mounted on min. copper pad.

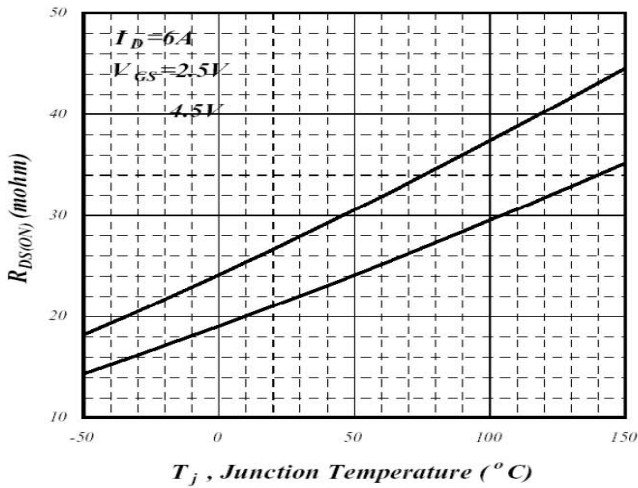
**CHARACTERISTICS CURVE**



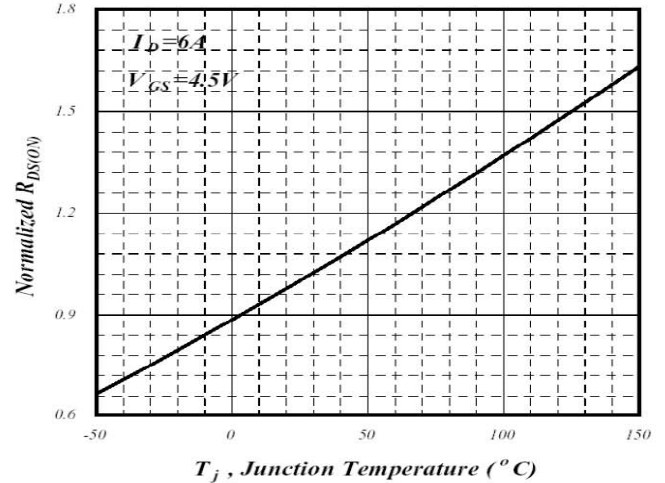
**Fig 1. Typical Output Characteristics**



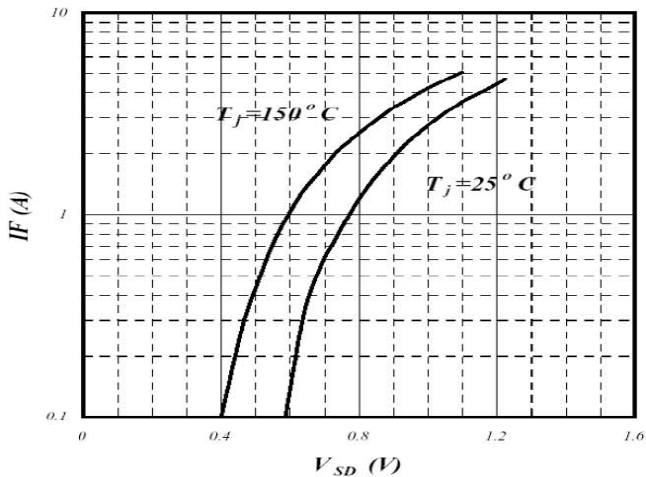
**Fig 2. Typical Output Characteristics**



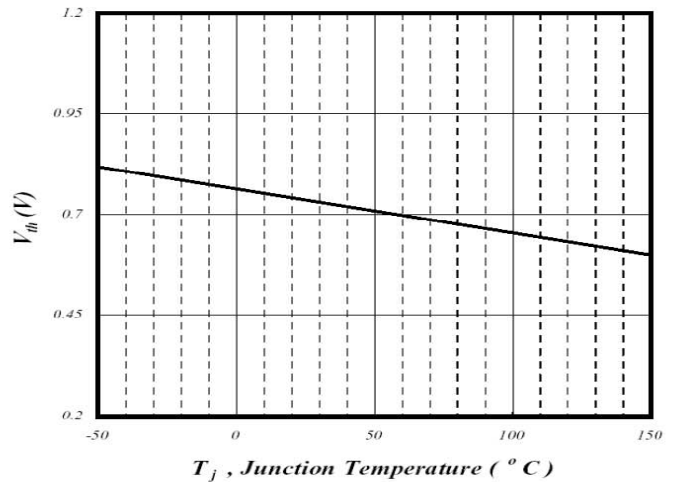
**Fig 3.  $R_{DS(ON)}$  vs. Junction Temperature**



**Fig 4. Normalized On-Resistance vs. Junction Temperature**

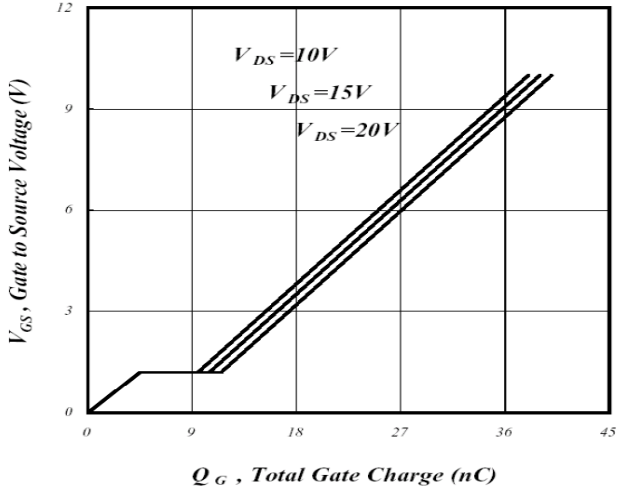


**Fig 5. Forward Characteristics of Reverse Diode**

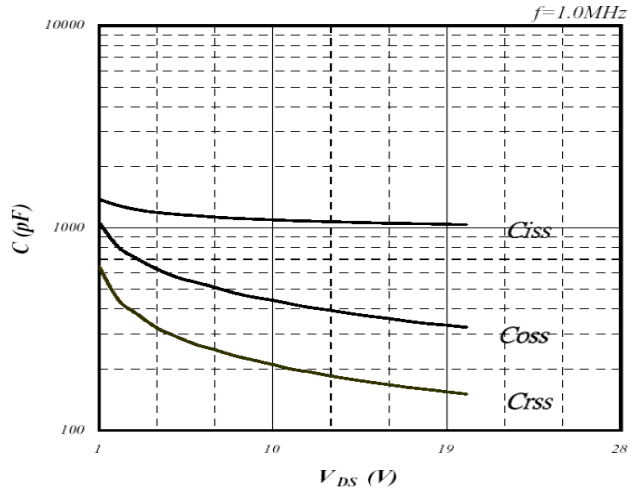


**Fig 6. Gate Threshold Voltage vs. Junction Temperature**

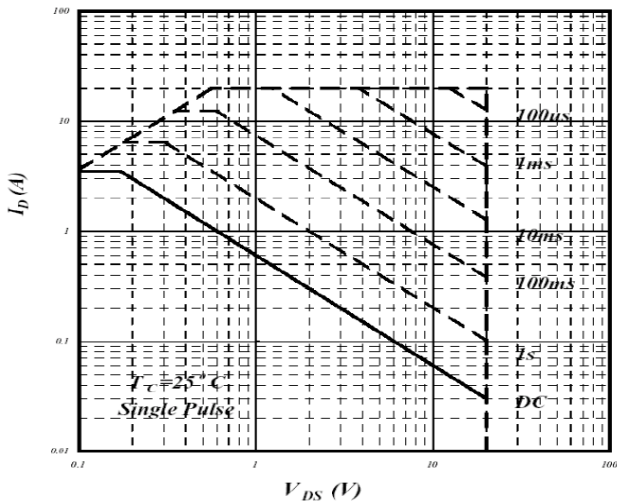
**CHARACTERISTICS CURVE**



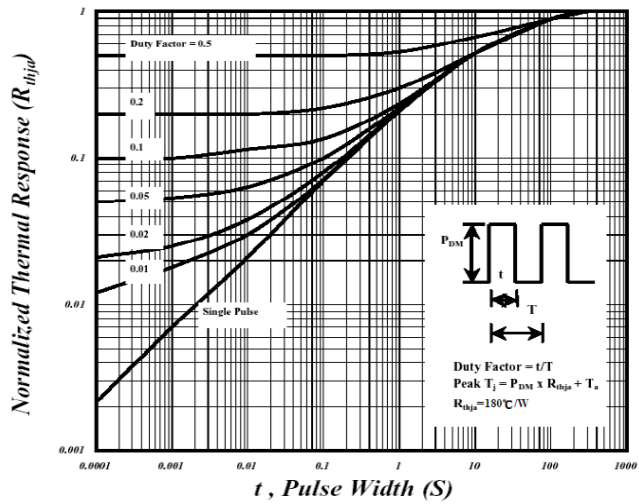
$Q_G$ , Total Gate Charge (nC)  
**Fig 7. Gate Charge Characteristics**



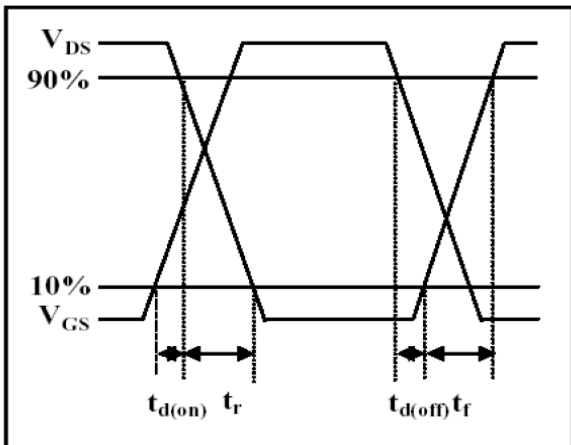
**Fig 8. Typical Capacitance Characteristics**



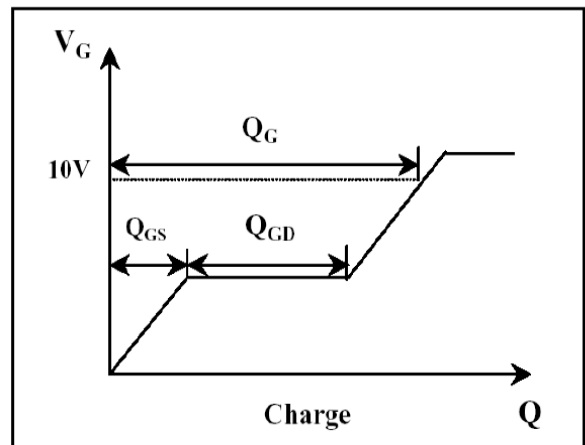
**Fig 9. Maximum Safe Operating Area**



**Fig 10. Effective Transient Thermal Impedance**



**Fig 11. Switching Time Waveform**



**Fig 12. Gate Charge Waveform**