

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

## DESCRIPTION

These miniature surface mount MOSFETs utilize High Cell Density process. Low  $R_{DS(on)}$  assures minimal power loss and conserves energy, making this device ideal for use in power management circuitry. Typical applications are power switch, power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

## TYPICAL APPLICATIONS

- Low  $R_{DS(on)}$  Provides Higher Efficiency and Extends Battery Life.
- Low Gate Charge.
- Fast Switch.
- Miniature TSOP-6 Surface Mount Package Saves Board Space.

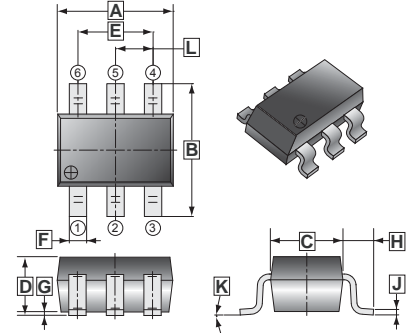
## PRODUCT SUMMARY

STT3402N		
$V_{DS}(V)$	$R_{DS(on)} (m\Omega)$	$I_D(A)$
30	0.027@ $V_{GS}= 10V$	6.3
	0.035@ $V_{GS}= 4.5V$	5.5

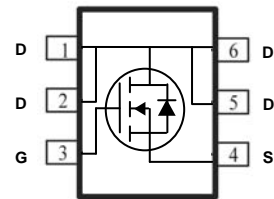
## PACKAGE INFORMATION

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( $T_A=25^\circ C$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Ratings	Unit
		Maximum	
Drain-Source Voltage	$V_{DS}$	30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	$T_A= 25^\circ C$	6.3
		$T_A= 70^\circ C$	5.2
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	$\pm 20$	A
Continuous Source Current (Diode Conduction) <sup>1</sup>	$I_S$	1.3	A
Power Dissipation <sup>1</sup>	$P_D$	$T_A= 25^\circ C$	1.6
		$T_A= 70^\circ C$	1.0
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ 150	$^\circ C$

## THERMAL RESISTANCE RATINGS

Parameter	Symbol	Maximum	Unit
Maximum Junction to Ambient <sup>1</sup>	$R_{\theta JA}$	78	$^\circ C / W$

### Notes

- 1 Surface Mounted on 1" x 1" FR4 Board.
- 2 Pulse width limited by maximum junction temperature.

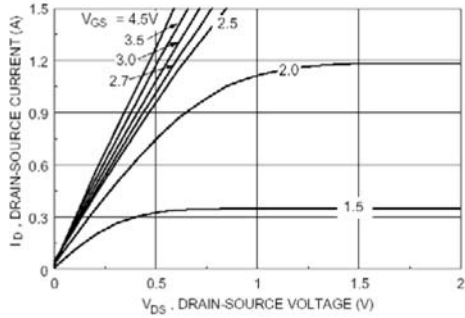
**ELECTRICAL CHARACTERISTICS** ( $T_A = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>SWITCH OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate-Body Leakage	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{DS}=0V, V_{GS}=\pm 20V$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	1	uA	$V_{DS}=24V, V_{GS}=0V$
		-	-	10		$V_{DS}=24V, V_{GS}=0V, T_J=55^\circ\text{C}$
<b>SWITCH ON CHARACTERISTICS</b>						
Gate-Threshold Voltage	$V_{GS(th)}$	1.0	1.6	3.0	V	$V_{DS}=V_{GS}, I_D=250\mu A$
On-State Drain Current <sup>1</sup>	$I_{D(on)}$	20	-	-	A	$V_{DS}=5V, V_{GS}=10V$
Drain-Source On-Resistance <sup>1</sup>	$R_{DS(ON)}$	-	23	27	m $\Omega$	$V_{GS}=10V, I_D=6.3A$
		-	32	39		$V_{GS}=10V, I_D=6.3A, T_J=55^\circ\text{C}$
		-	29	35		$V_{GS}=4.5V, I_D=5.5A$
Forward Transconductance <sup>1</sup>	$g_{fs}$	-	45	-	S	$V_{DS}=10V, I_D=6.3A$
Diode Forward Voltage <sup>1</sup>	$V_{SD}$	-	0.75	1.2	V	$I_S=1.3A, V_{GS}=0V$
<b>DYNAMIC <sup>b</sup></b>						
Total Gate Charge	$Q_g$	-	9	13	nC	$V_{DS}=15V, V_{GS}=5V, I_D=6.3A, R_L=6\Omega$
Gate-Source Charge	$Q_{gs}$	-	2.9	-		
Gate-Drain Charge	$Q_{gd}$	-	3.2	-		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-on Delay Time	$T_{d(on)}$	-	6	13	nS	$V_{DS}=15V, V_{GEN}=10V, R_L=6\Omega, I_D=1A, R_{GEN}=6\Omega$
Rise Time	$T_r$	-	10	19		
Turn-off Delay Time	$T_{d(off)}$	-	18	30		
Fall Time	$T_f$	-	5	13		

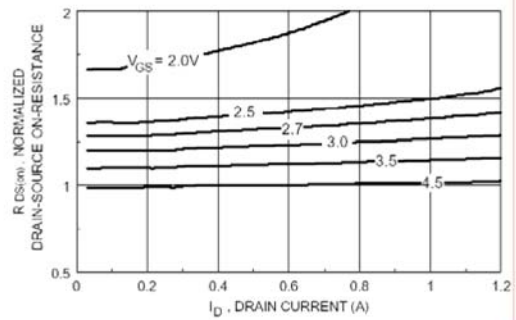
Notes

- 1 Pulse test :  $PW \leq 300 \mu s$  duty cycle  $\leq 2\%$ .
- 2 Guaranteed by design, not subject to production testing.

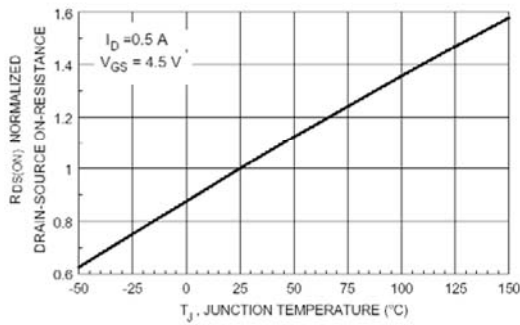
**CHARACTERISTIC CURVES**



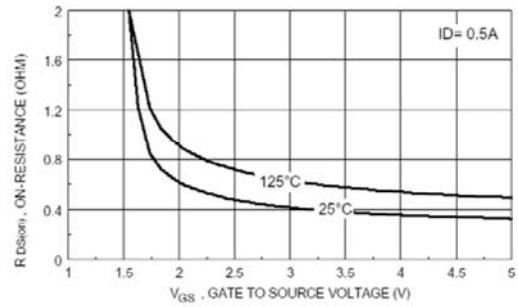
**Figure 1. On-Region Characteristics**



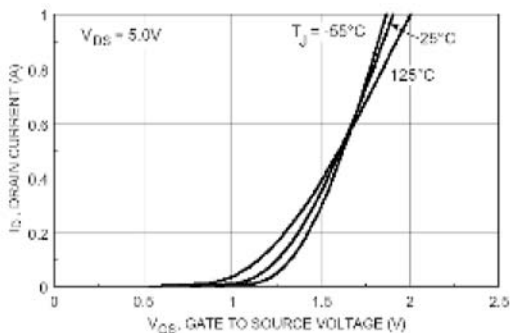
**Figure 2. On-Resistance Variation with Drain Current and Gate Voltage**



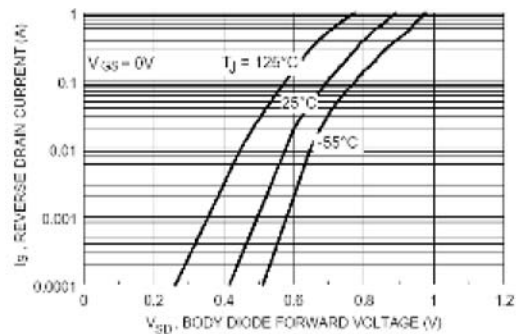
**Figure 3. On-Resistance Variation with Temperature**



**Figure 4. On-Resistance Variation with Gate to Source Voltage**



**Figure 5. Transfer Characteristics**



**Figure 6. Body Diode Forward Voltage Variation with Source Current and Temperature**

**CHARACTERISTIC CURVES**

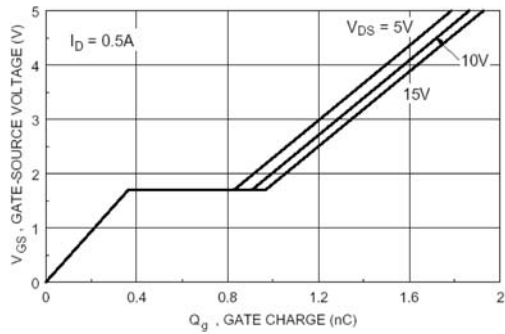


Figure 7. Gate Charge Characteristics.

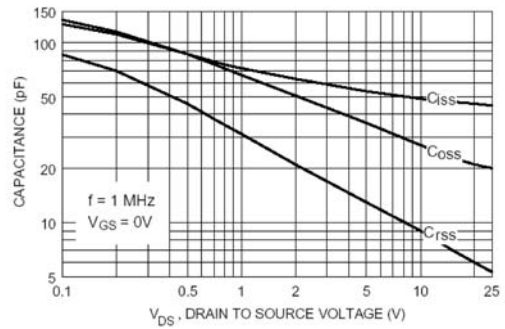


Figure 8. Capacitance Characteristics.

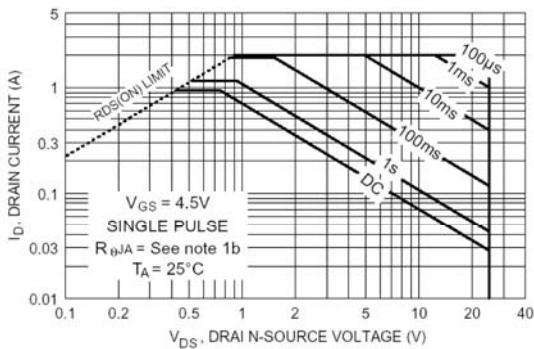


Figure 9. Maximum Safe Operating Area.

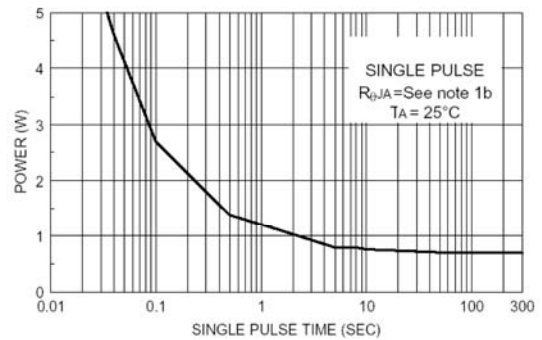


Figure 10. Single Pulse Maximum Power Dissipation.

**Normalized Thermal Transient Junction to Ambient**

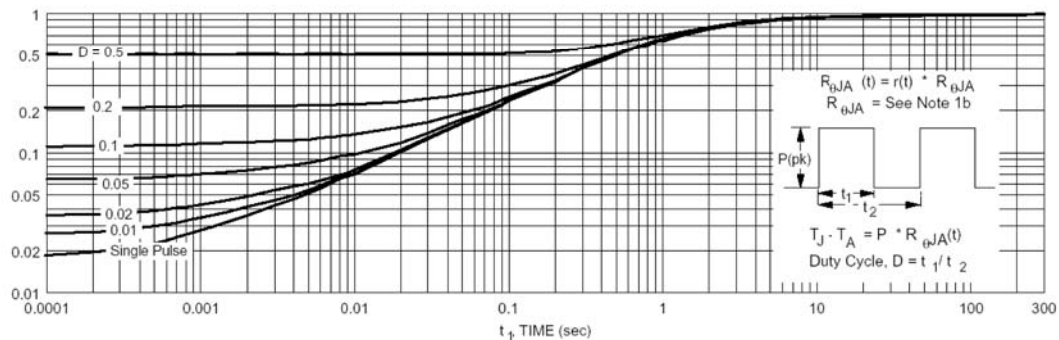


Figure 11. Transient Thermal Response Curve