

RoHS Compliant Product

## Description

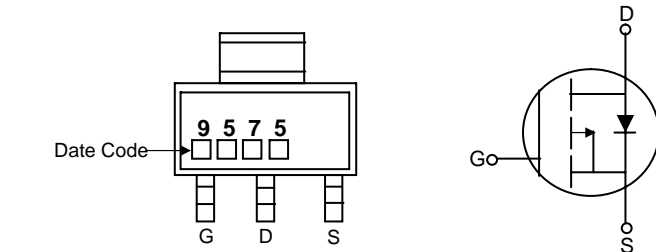
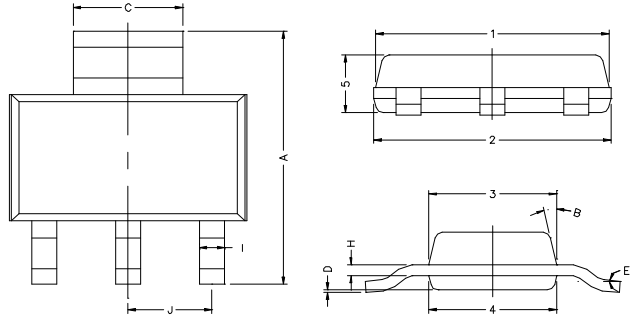
The SSM9575 provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness.

The SSM9575 is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

## Features

- \* Simple Drive Requirement
- \* Fast Switching Characteristic
- \* Lower On-Resistance

SOT-223



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.70	7.30	B	13°TYP.	
C	2.90	3.10	J	2.30 REF.	
D	0.02	0.10	1	6.30	6.70
E	0°	10°	2	6.30	6.70
I	0.60	0.80	3	3.30	3.70
H	0.25	0.35	4	3.30	3.70
			5	1.40	1.80

## Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	V <sub>DS</sub>	-60	V
Gate-Source Voltage	V <sub>GS</sub>	±25	V
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @T <sub>A</sub> =25°C	-4.0	A
Continuous Drain Current <sup>3</sup>	I <sub>D</sub> @T <sub>A</sub> =70°C	-3.2	A
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	-20	A
Total Power Dissipation	P <sub>D</sub> @T <sub>A</sub> =25°C	3.0	W
Linear Derating Factor		0.02	W/°C
Operating Junction and Storage Temperature Range	T <sub>j</sub> , T <sub>stg</sub>	-55~+150	°C

## Thermal Data

Parameter	Symbol	Ratings	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	R <sub>thj-a</sub>	45	°C/W

## Electrical Characteristics( $T_j=25^\circ C$ Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	$BV_{DSS}$	-60	-	-	V	$V_{GS}=0V, I_D=-250\mu A$
Breakdown Voltage Temp. Coefficient	$\Delta BV_{DSS}/\Delta T_j$	-	-0.04	-	$V/^\circ C$	Reference to $25^\circ C, I_D=-1mA$
Gate Threshold Voltage	$V_{GS(th)}$	-1.0	-	-3.0	V	$V_{DS}=V_{GS}, I_D=-250\mu A$
Gate-Source Leakage Current	$I_{GSS}$	-	-	$\pm 100$	nA	$V_{GS}=\pm 25V$
Drain-Source Leakage Current ( $T_j=25^\circ C$ )	$I_{DSS}$	-	-	-1	$\mu A$	$V_{DS}=-60V, V_{GS}=0$
Drain-Source Leakage Current( $T_j= 70^\circ C$ )		-	-	-25	$\mu A$	$V_{DS}=-48V, V_{GS}=0$
Static Drain-Source On-Resistance <sup>2</sup>	$R_{DS(ON)}$	-	-	90	$m\Omega$	$V_{GS}=-10V, I_D=-4A$
		-	-	120		$V_{GS}=-4.5V, I_D=-3A$
Total Gate Charge <sup>2</sup>	$Q_g$	-	18	28	nC	$I_D=-4A$ $V_{DS}=-48V$ $V_{GS}=4.5V$
Gate-Source Charge	$Q_{gs}$	-	5	-		
Gate-Drain ("Miller") Charge	$Q_{gd}$	-	7	-		
Turn-on Delay Time <sup>2</sup>	$T_{d(ON)}$	-	12	-	nS	$V_{DD}=-30V$ $I_D=-1A$ $V_{GS}=-10V$ $R_G=3.3\Omega$ $R_D=30\Omega$
Rise Time	$T_r$	-	5	-		
Turn-off Delay Time	$T_{d(OFF)}$	-	68	-		
Fall Time	$T_f$	-	32	-		
Input Capacitance	$C_{iss}$	-	1745	2790	pF	$V_{GS}=0V$ $V_{DS}=-25V$ $f=1.0MHz$
Output Capacitance	$C_{oss}$	-	165	-		
Reverse Transfer Capacitance	$C_{rss}$	-	125	-		
Forward Transconductance	$G_{fs}$	-	7	-	S	$V_{DS}=-10V, I_D=-4A$

## Source-Drain Diode

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage <sup>2</sup>	$V_{SD}$	-	-	-1.2	V	$I_S=-2A, V_{GS}=0V.$
Reverse Recovery Time <sup>2</sup>	$T_{rr}$	-	56	-	nS	$I_S=-3.2A, V_{GS}=0V.$ $di/dt=100A/\mu s$
Reverse Recovery Charge	$Q_{rr}$	-	146	-	nC	

Notes: 1.Pulse width limited by Max. junction temperature.

2.Pulse width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

3.Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board;  $120^\circ C/W$  when mounted on min. copper pad.

### Characteristics Curve

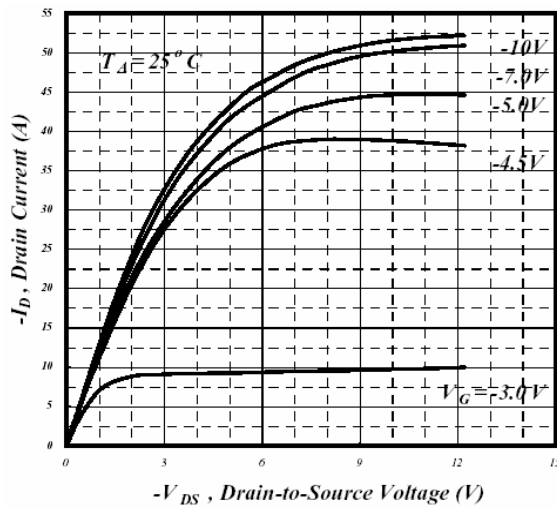


Fig 1. Typical Output Characteristics

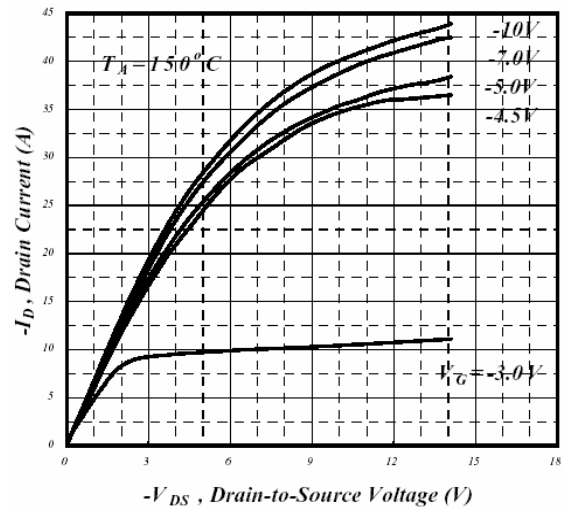


Fig 2. Typical Output Characteristics

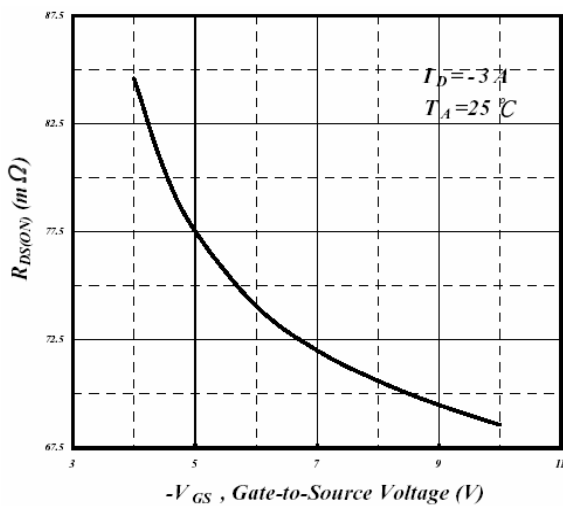


Fig 3. On-Resistance v.s. Gate Voltage

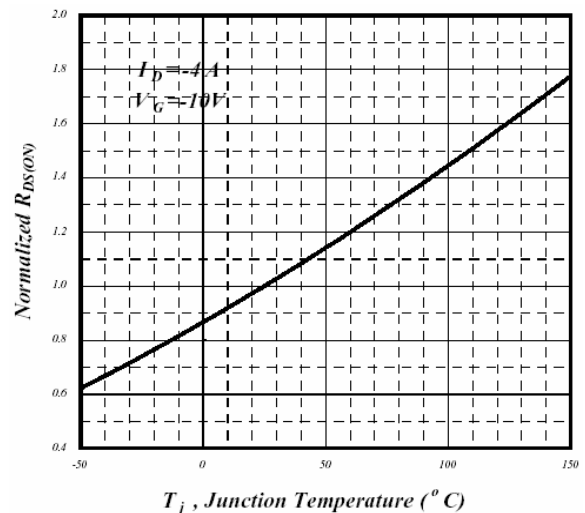


Fig 4. Normalized On-Resistance v.s. Junction Temperature

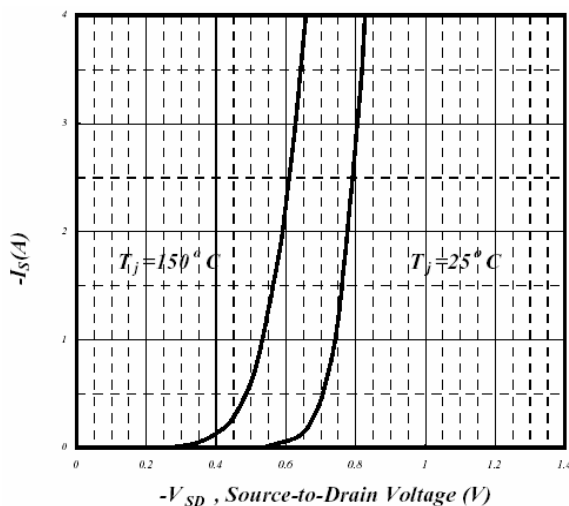


Fig 5. Forward Characteristics of Reverse Diode

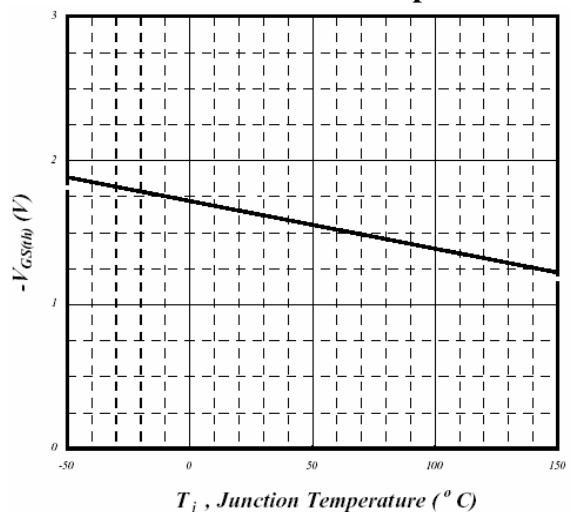


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

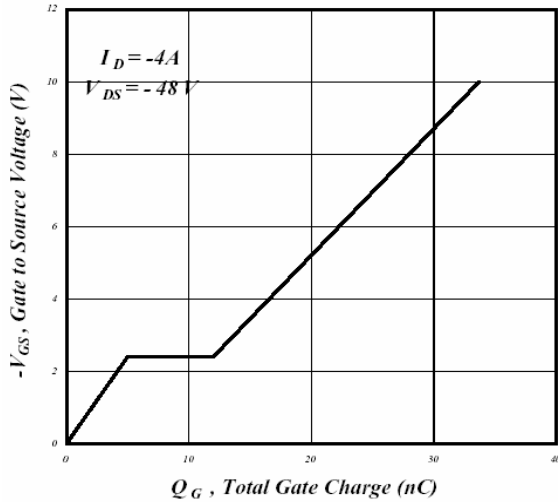


Fig 7. Gate Charge Characteristics

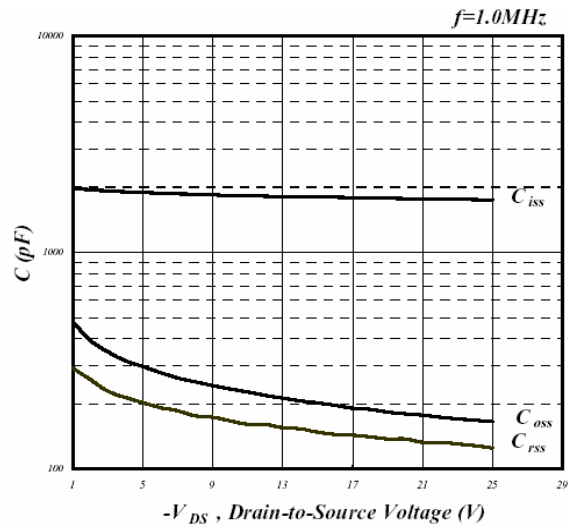


Fig 8. Typical Capacitance Characteristics

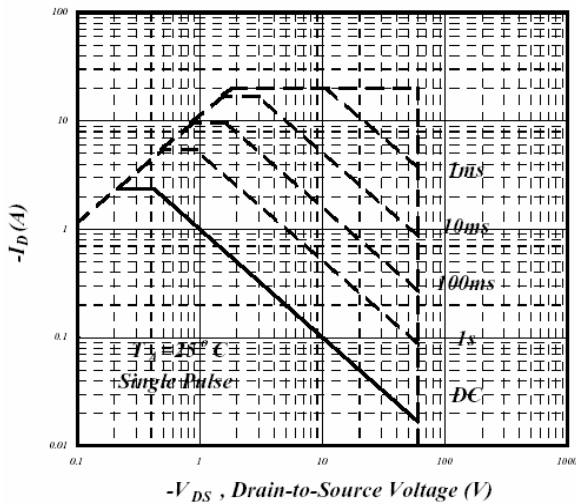


Fig 9. Maximum Safe Operating Area

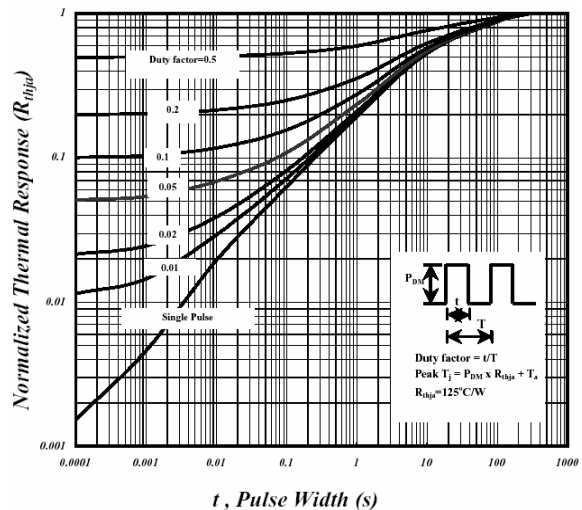


Fig 10. Effective Transient Thermal Impedance

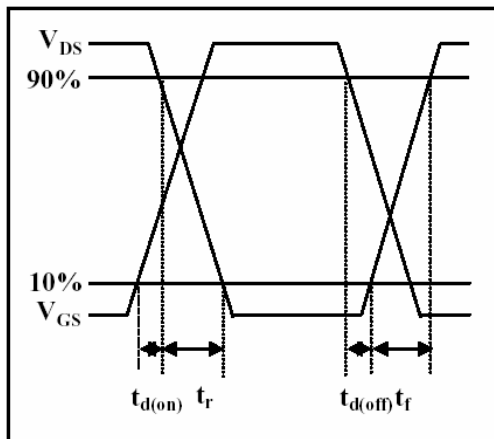


Fig 11. Switching Time Circuit

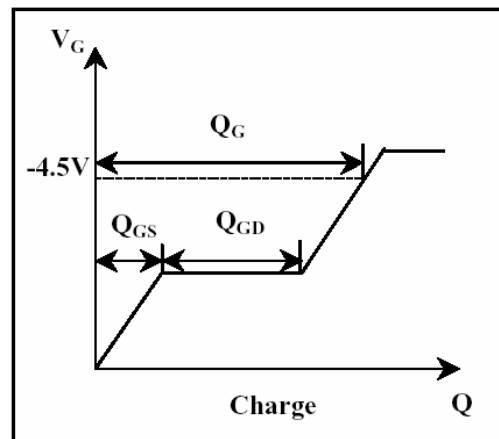


Fig 12. Gate Charge Waveform