

RoHS Compliant Product

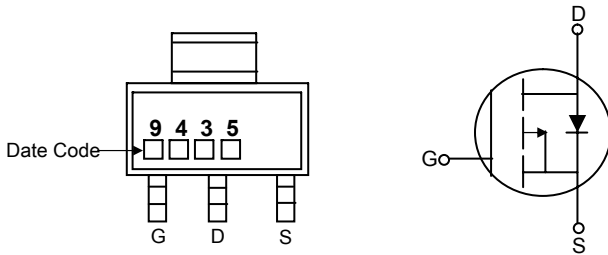
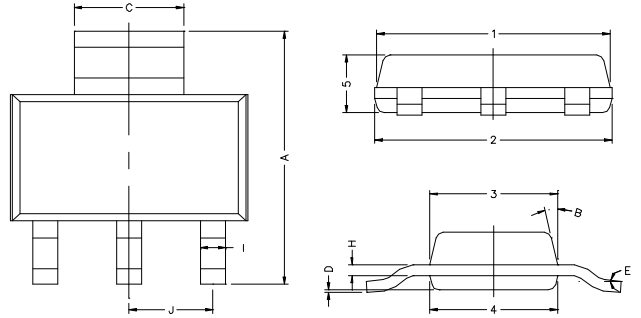
## Description

The SSM9435 provide the designer with best combination of fast switching, low on-resistance and cost-effectiveness.

## 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>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±25	V
Continuous Drain Current <sup>3</sup>	I <sub>D@T<sub>A</sub>=25°C</sub>	-6.0	A
Continuous Drain Current <sup>3</sup>	I <sub>D@T<sub>A</sub>=70°C</sub>	-4.8	A
Pulsed Drain Current <sup>1,2</sup>	I <sub>DM</sub>	-20	A
Total Power Dissipation	P <sub>D@T<sub>A</sub>=25°C</sub>	2.7	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<sub>j</sub>=25°C Unless otherwise specified)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	-30	-	-	V	V <sub>GS</sub> =0V, I <sub>D</sub> =-250uA
Breakdown Voltage Temp. Coefficient	ΔBV <sub>DSS</sub> /ΔT <sub>j</sub>	-	-0.02	-	V/°C	Reference to 25°C, I <sub>D</sub> =-1mA
Gate Threshold Voltage	V <sub>GS(th)</sub>	-1.0	-	-3.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250uA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> =±25V
Drain-Source Leakage Current (T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	-1	uA	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0
Drain-Source Leakage Current(T <sub>j</sub> = 70°C)		-	-	-25	uA	V <sub>DS</sub> =-24V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance <sup>2</sup>	R <sub>DS(ON)</sub>	-	-	50	mΩ	V <sub>GS</sub> =-10V, I <sub>D</sub> =-5.3A
		-	-	100		V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-4.2A
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	-	9.2	16	nC	I <sub>D</sub> =-5.3A V <sub>DS</sub> =-24V V <sub>GS</sub> =4.5V
Gate-Source Charge	Q <sub>gs</sub>	-	2.8	-		
Gate-Drain ("Miller") Charge	Q <sub>gd</sub>	-	5.2	-		
Turn-on Delay Time <sup>2</sup>	T <sub>d(ON)</sub>	-	11	-	nS	V <sub>DD</sub> =-15V I <sub>D</sub> =-1A V <sub>GS</sub> =-10V R <sub>G</sub> =6 Ω R <sub>D</sub> =15 Ω
Rise Time	T <sub>r</sub>	-	8	-		
Turn-off Delay Time	T <sub>d(off)</sub>	-	25	-		
Fall Time	T <sub>f</sub>	-	17	-		
Input Capacitance	C <sub>iss</sub>	-	507	912	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =-15V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	222	-		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	158	-		
Forward Transconductance	G <sub>fs</sub>	-	10	-	S	V <sub>DS</sub> =-10V, I <sub>D</sub> =-5.3A

## Source-Drain Diode

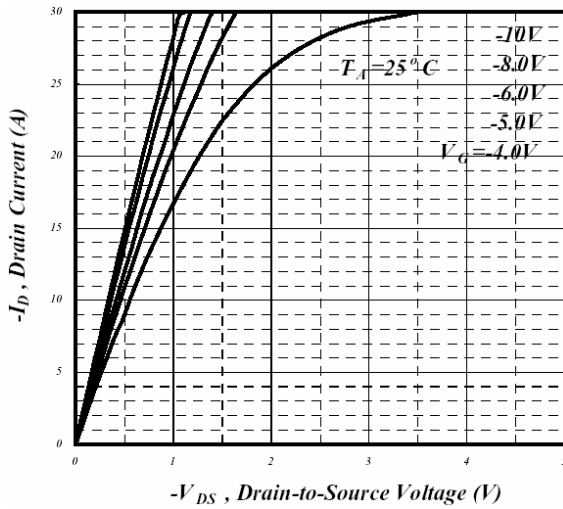
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	-1.2	V	I <sub>S</sub> =-2.3A, V <sub>GS</sub> =0V.
Reverse Recovery Time	T <sub>rr</sub>	-	29	-	nS	I <sub>S</sub> =-5.3A, V <sub>GS</sub> =0V. dI/dt=100A/us
Reverse Recovery Charge	Q <sub>rr</sub>	-	20	-	nC	

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

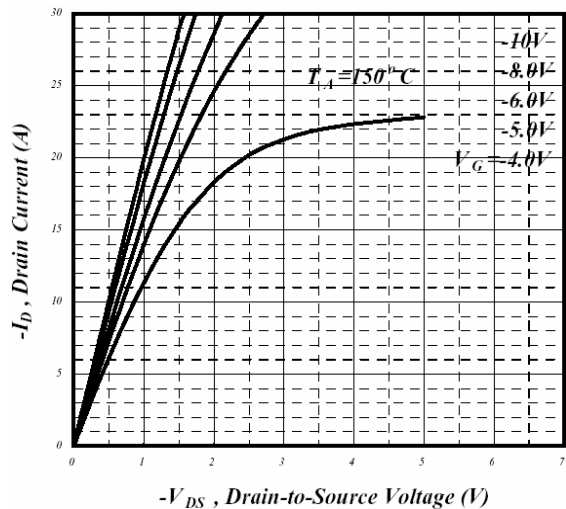
2. Pulse width ≤300us, dutycycle ≤2%.

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

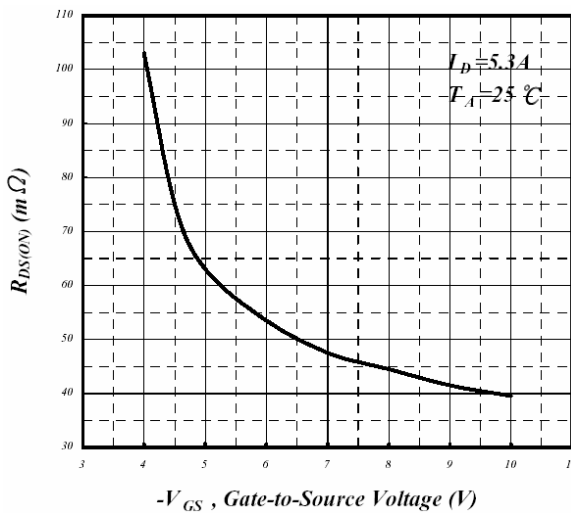
**Characteristics Curve**



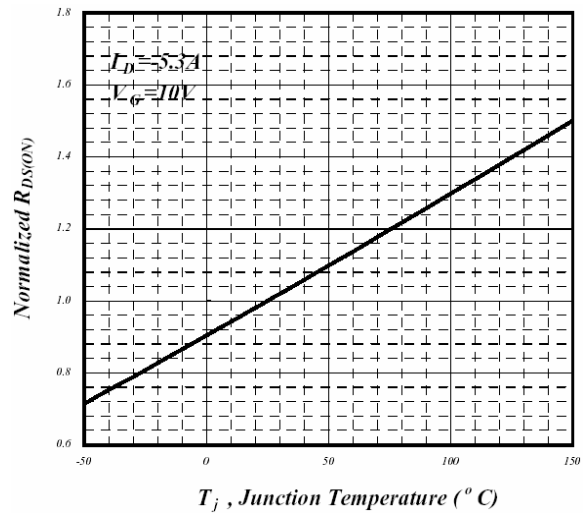
**Fig 1. Typical Output Characteristics**



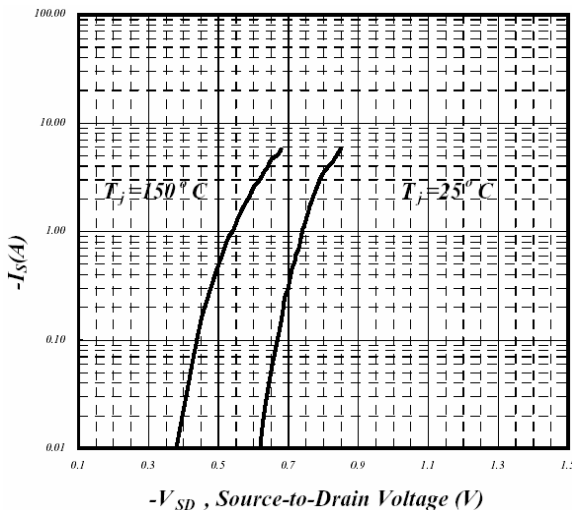
**Fig 2. Typical Output Characteristics**



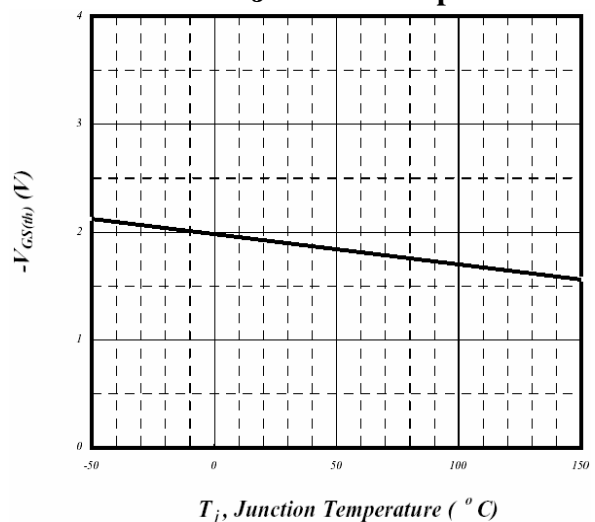
**Fig 3. On-Resistance v.s. Gate Voltage**



**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**

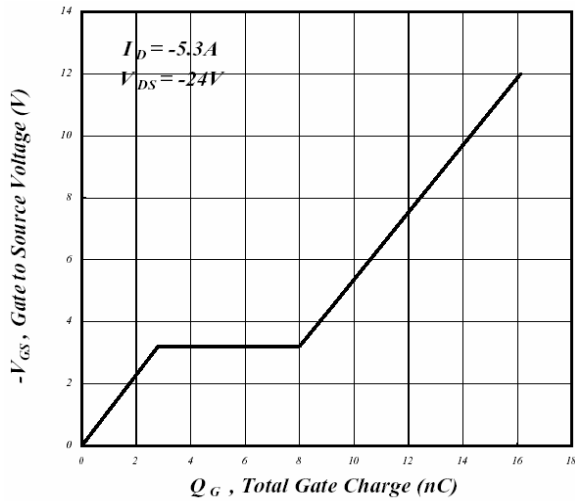


Fig 7. Gate Charge Characteristics

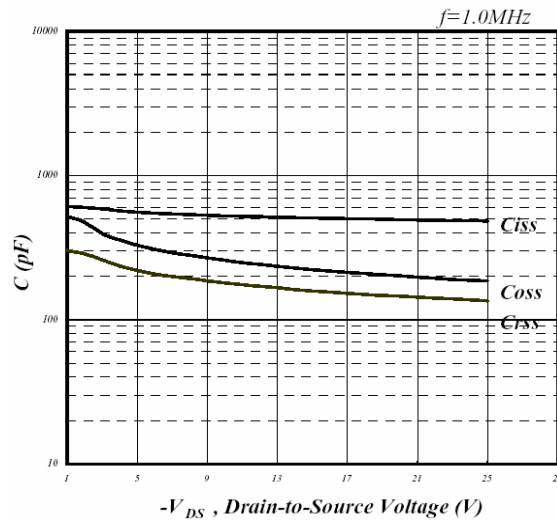


Fig 8. Typical Capacitance Characteristics

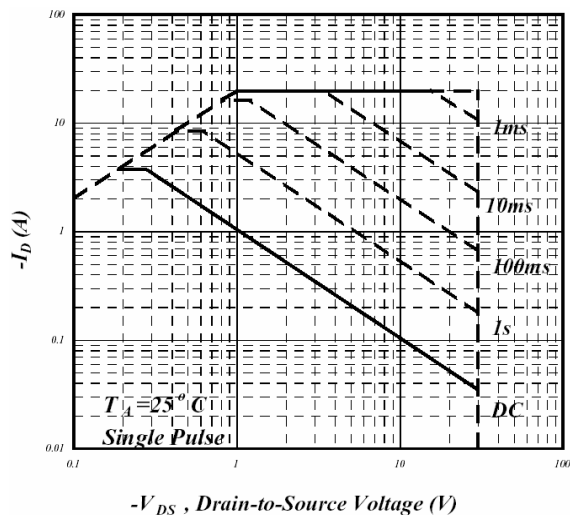


Fig 9. Maximum Safe Operating Area

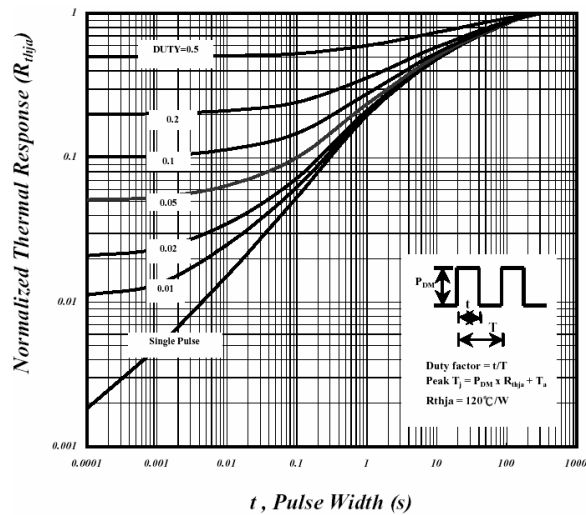


Fig 10. Effective Transient Thermal Impedance

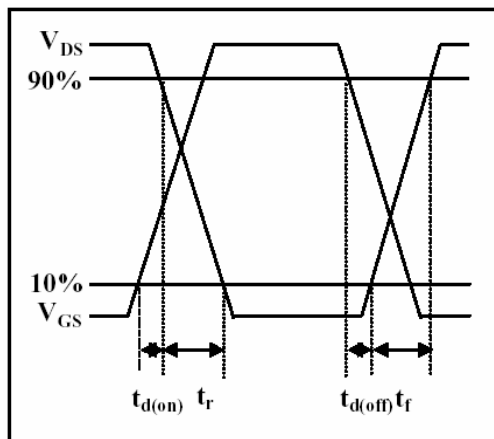


Fig 11. Switching Time Circuit

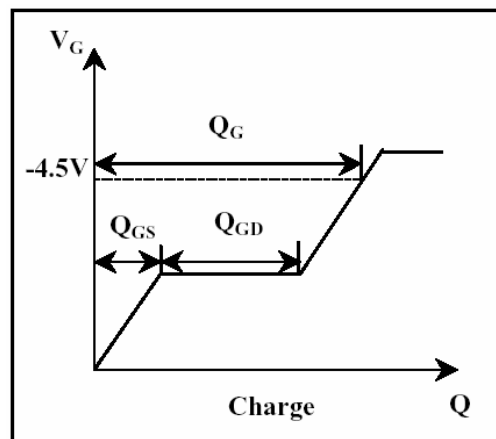


Fig 12. Gate Charge Waveform