

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

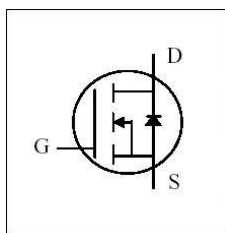
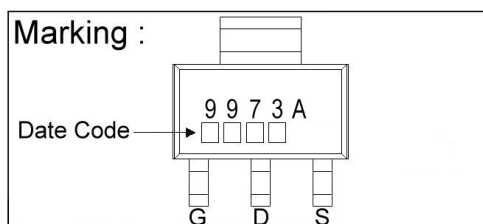
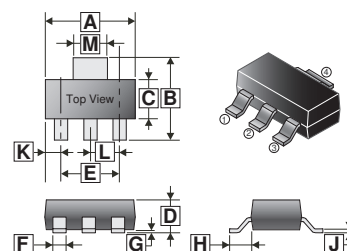
SOT-223

DESCRIPTION

The SSM9973A provide the designer with the best combination of fast switching, ruggedized design, low on-resistance and cost effectiveness. The SOT-223 package is universally preferred for all commercial-industrial surface mount applications and suited for low voltage applications such as DC/DC converters.

FEATURES

- Simply drive requirement
- Super high density cell design for extremely low $R_{DS(ON)}$



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.20	6.70	G	-	0.10
B	6.70	7.30	H	-	-
C	3.30	3.70	J	0.25	0.35
D	1.42	1.90	K	-	-
E	4.50	4.70	L	2.30 REF.	
F	0.60	0.82	M	2.90	3.10

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

PARAMETER	SYMBOL	RATING	UNIT
Drain – Source Voltage	V_{DS}	60	V
Gate – Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ³ , $V_{GS}@10V$	I_D	$T_A = 25^\circ\text{C}$	5.0
		$T_A = 70^\circ\text{C}$	4.0
Pulsed Drain Current ^{1,2}	I_{DM}	10	A
Total Power Dissipation, $T_A = 25^\circ\text{C}$	P_D	2.7	W
Maximum Junction – Ambient ³	$R_{\theta JA}$	45	$^\circ\text{C/W}$
Linear Derating Factor		0.02	$\text{W}/^\circ\text{C}$
Operating Junction & Storage Temperature Range	T_J, T_{STG}	150, -55~150	$^\circ\text{C}$

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITION
Drain-Source Breakdown Voltage	BV_{DSS}	60	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Gate Threshold Voltage	$V_{GS(TH)}$	0.5	-	1.5	V	$V_{DS}=V_{GS}, I_D=250\mu A$
Forward Transconductance	g_{FS}	-	12	-	S	$V_{DS}=15V, I_D=4A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS}=\pm 20V$
Drain-Source Leakage Current	I_{DSS}	$T_A = 25^\circ\text{C}$	-	1	μA	$V_{DS}=60V, V_{GS}=0V$
		$T_A = 70^\circ\text{C}$	-	10	μA	$V_{DS}=60V, V_{GS}=0V$
Drain-Source On Resistance	$R_{DS(ON)}$	-	-	115	m Ω	$V_{GS}=10V, I_D=5A$
		-	-	125		$V_{GS}=4.5V, I_D=4.5A$
Total Gate Charge ²	Q_g	-	4.0	-	nC	$V_{GS}=4.5V$
Gate-Source Charge	Q_{gs}	-	1.2	-		$V_{DS}=30V$
Gate-Drain Charge	Q_{gd}	-	1.0	-		$I_D=4A$
Turn-on Delay Time ²	$T_{d(ON)}$	-	6	-	nS	$V_{DD}=30V$
Rise Time	T_r	-	12	-		$V_{GS}=10V$
Turn-off Delay Time	$T_{d(OFF)}$	-	18	-		$I_D=2.5A$
Fall Time	T_f	-	10	-		$R_G=6\Omega, R_L=12\Omega$
Input Capacitance	C_{ISS}	-	320	-	pF	$V_{DS}=30V$
Output Capacitance	C_{OSS}	-	42	-		$V_{GS}=0V$
Reverse Transfer Capacitance	C_{RSS}	-	20	-		$f=1\text{MHz}$
SOURCE-DRAIN DIODE CHARACTERISTICS						
Forward On Voltage ²	V_{SD}	-	-	1.2	V	$V_{GS}=0V, I_S=2.5A$

Note: 1. Pulse width limited by Maximum junction temperature. 2. Pulse width $\leq 300\mu S$, Duty cycle $\leq 2\%$

3. Surface mounted on 1 in² copper pad of FR4 board; 120 $^\circ\text{C/W}$ when mounted on m in, copper pad.

CHARACTERISTIC CURVES

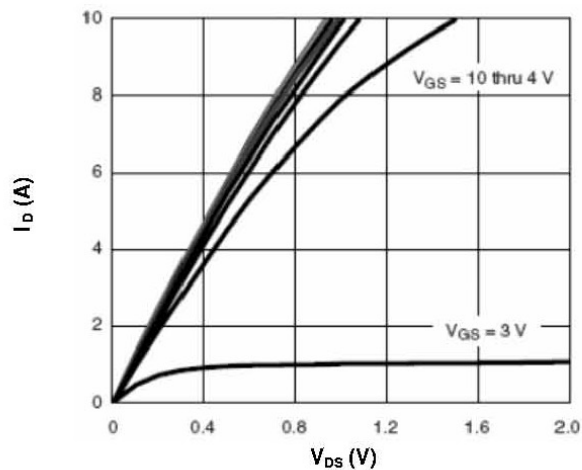


Fig 1. Typical Output Characteristics

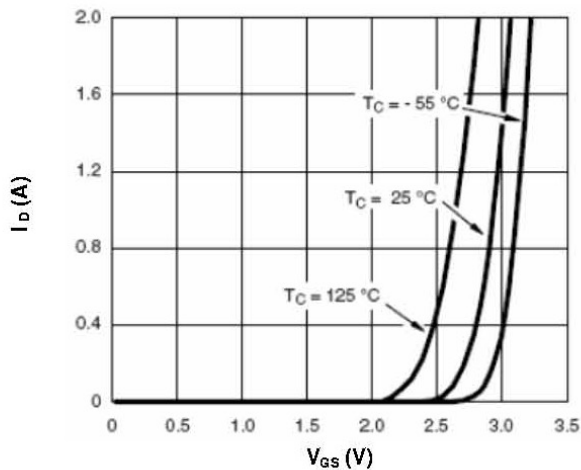


Fig 2. Transfer Characteristics

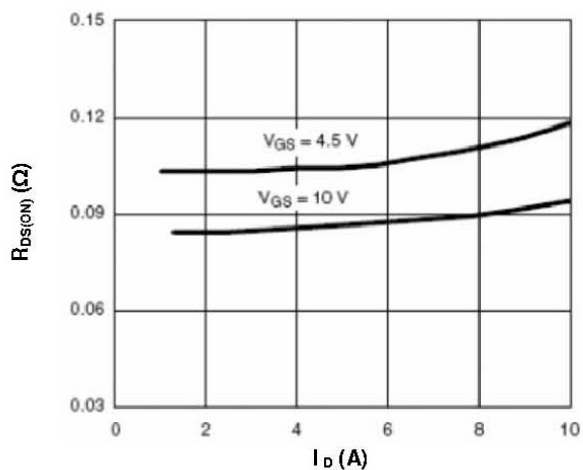


Fig 3. On-Resistance vs. Drain Current and Gate Voltage

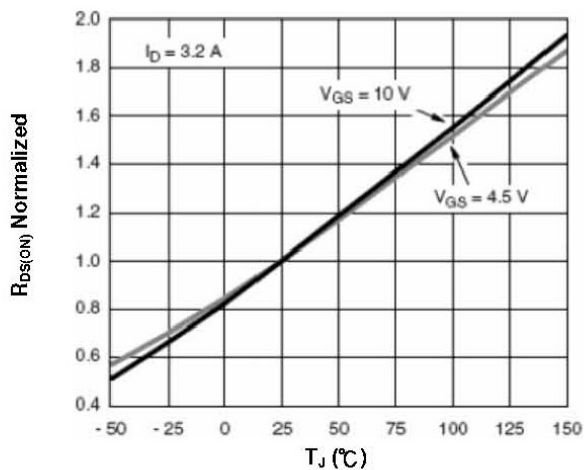


Fig 4. On-Resistance vs. Junction Temperature

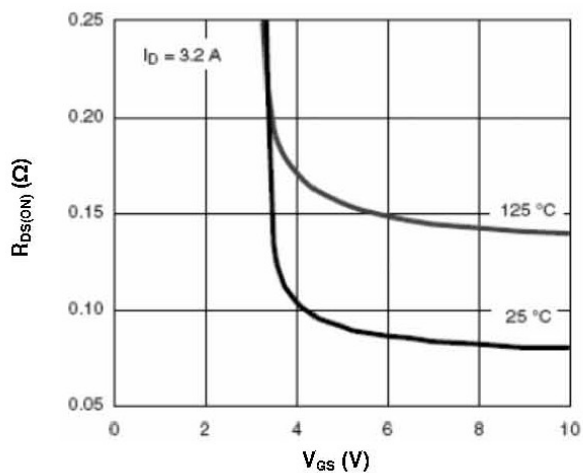


Fig 5. On-Resistance vs. Gate-Source Voltage

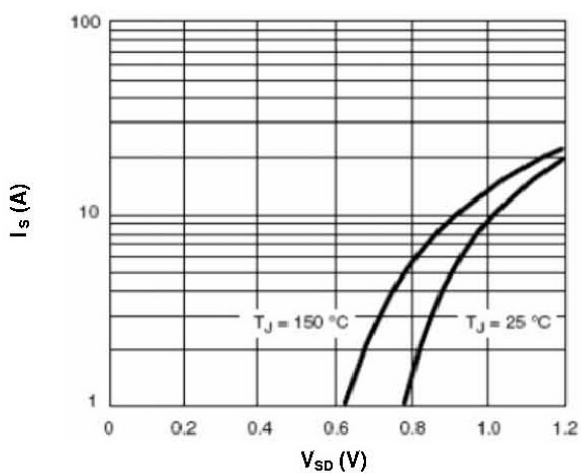


Fig 6. Body Diode Characteristics

CHARACTERISTIC CURVES

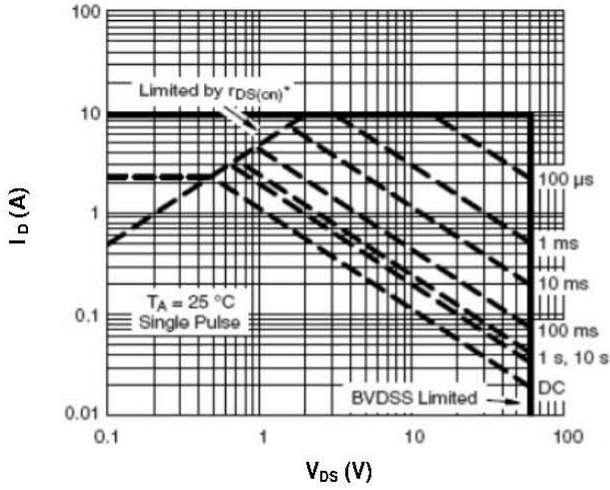


Fig 7. Maximum Safe Operating Area

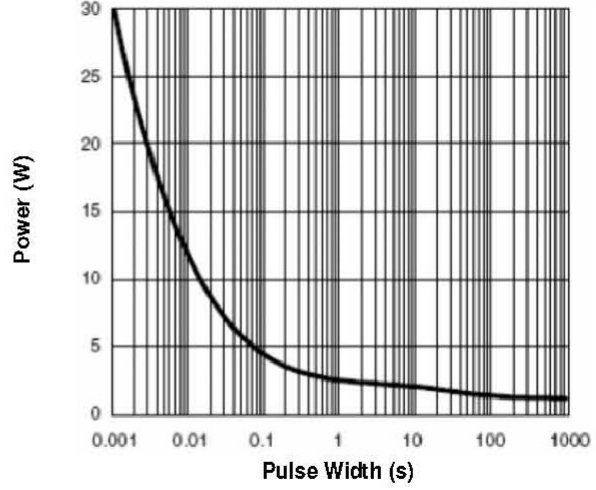


Fig 8. Single Pulse Maximum Power Dissipation

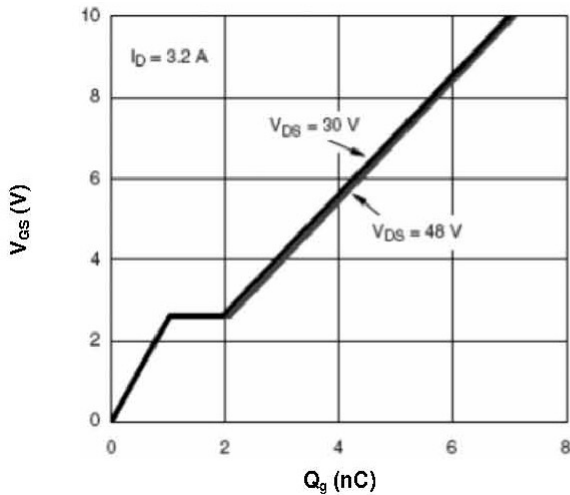


Fig 9. Gate Charge Characteristics

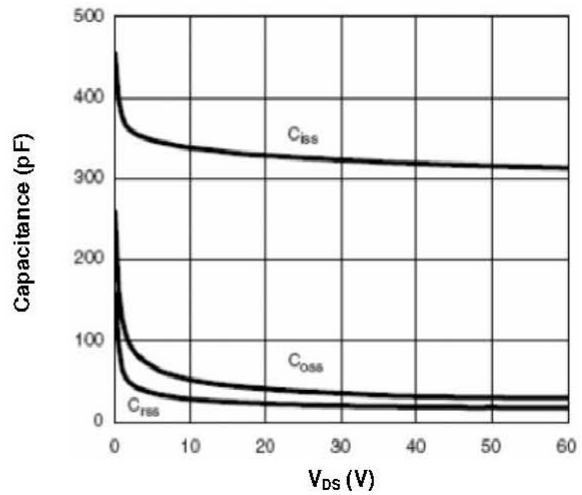


Fig 10. Typical Capacitance Characteristics

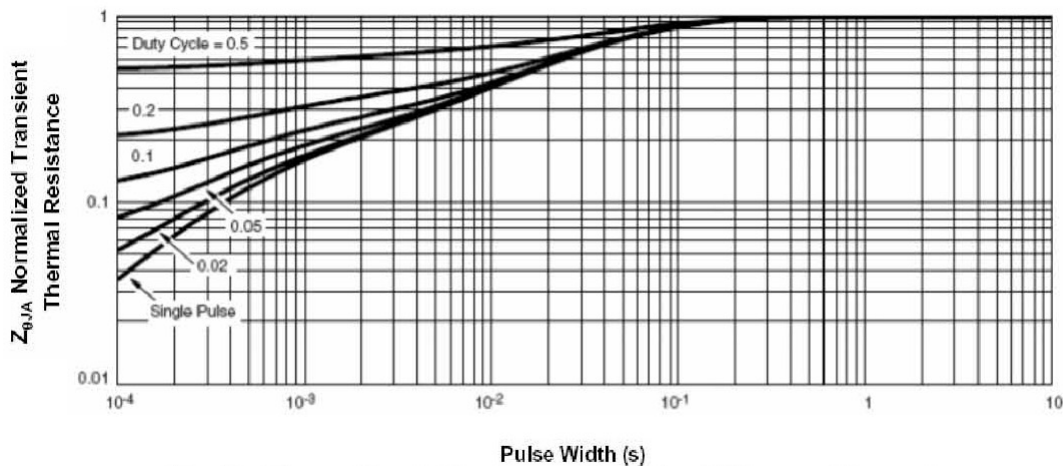


Fig 11. Normalized Maximum Transient Thermal Impedance