

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

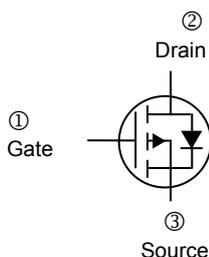
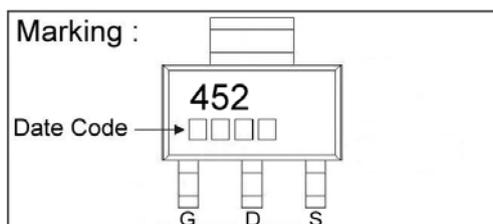
DESCRIPTION

The SSM452 provide the designer with the best combination of fast switching, low on-resistance and cost-effectiveness.

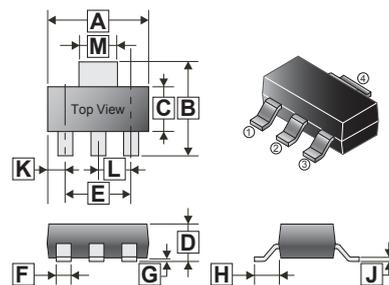
FEATURES

- Simple Drive Requirement
- Lower On-resistance
- Fast Switching

MARKING



SOT-223



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}	-30	V
Gate – Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ³	I_D	$T_A = 25^\circ\text{C}$	-6.0
		$T_A = 70^\circ\text{C}$	-4.8
Pulsed Drain Current ¹	I_{DM}	-20	A
Total Power Dissipation	P_D	2.7	W
Linear Derating Factor		0.02	W / $^\circ\text{C}$
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ\text{C}$
THERMAL DATA			
Maximum Junction–Ambient ³	$R_{\theta JA}$	45	$^\circ\text{C} / \text{W}$

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

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT	TEST CONDITION
Drain-Source Breakdown Voltage	BV_{DSS}	-30	-	-	V	$V_{GS} = 0V, I_D = -250\mu A$
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS} / \Delta T_J$	-	-0.02	-	V / $^\circ\text{C}$	Reference to 25°C , $I_D = -1mA$
Gate Threshold Voltage	$V_{GS(TH)}$	-1.0	-	-3.0	V	$V_{DS} = V_{GS}, I_D = -250\mu A$
Forward Transconductance	g_{FS}	-	10	-	S	$V_{DS} = -10V, I_D = -5.3A$
Gate-Source Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 20V$
Drain-Source Leakage Current ($T_J = 25^\circ\text{C}$)	I_{DSS}	-	-	-1	μA	$V_{DS} = -30V, V_{GS} = 0V$
Drain-Source Leakage Current ($T_J = 70^\circ\text{C}$)		-	-	-25		$V_{DS} = -24V, V_{GS} = 0V$
Drain-Source On Resistance	$R_{DS(ON)}$	-	45	55	m Ω	$V_{GS} = -10V, I_D = -5.3A$
		-	75	100		$V_{GS} = -4.5V, I_D = -4.2A$
Total Gate Charge ²	Q_g	-	9.2	16	nC	$V_{GS} = -4.5V$
Gate-Source Charge	Q_{gs}	-	2.8	-		$V_{DS} = -24V$
Gate-Drain ("Miller") Charge	Q_{gd}	-	5.2	-		$I_D = -5.3A$
Turn-on Delay Time ²	$T_{d(ON)}$	-	11	-	nS	$V_{DS} = -15V$
Rise Time	T_r	-	8	-		$V_{GS} = -10V$
Turn-off Delay Time	$T_{d(OFF)}$	-	25	-		$I_D = -1A$
Fall Time	T_f	-	17	-		$R_G = 6\Omega, R_D = 15\Omega$
Input Capacitance	C_{ISS}	-	507	912	pF	$V_{DS} = -15V$
Output Capacitance	C_{OSS}	-	222	-		$V_{GS} = 0V$
Reverse Transfer Capacitance	C_{RSS}	-	158	-		$f = 1MHz$
SOURCE-DRAIN DIODE						
Forward On Voltage ²	V_{SD}	-	-	-1.2	V	$V_{GS} = 0V, I_S = -2.3A$
Reverse Recovery Time	T_{rr}	-	29	-	nS	$V_{GS} = 0V, I_S = -5.3A,$
Reverse Recovery Charge	Q_{rr}	-	20	-	nC	$di/dt = 100A/\mu s$

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 Min. copper pad.

CHARACTERISTIC CURVES

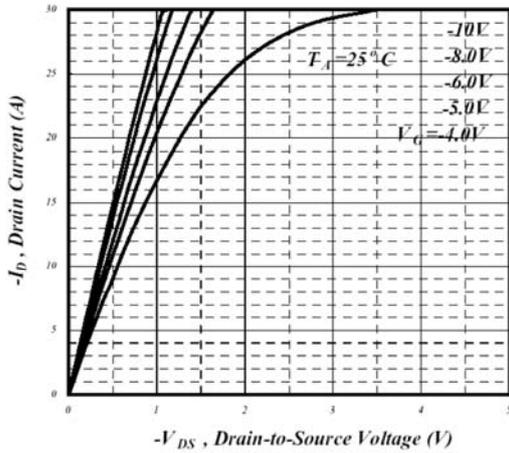


Fig 1. Typical Output Characteristics

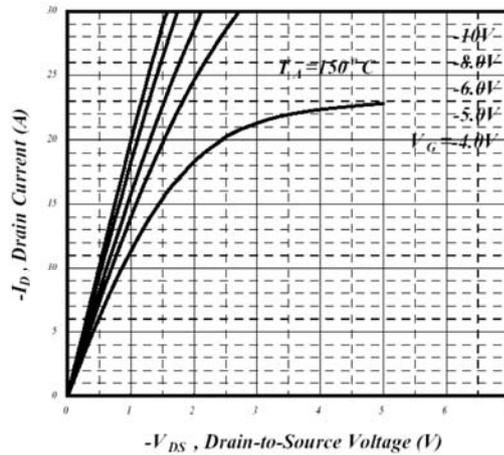


Fig 2. Typical Output Characteristics

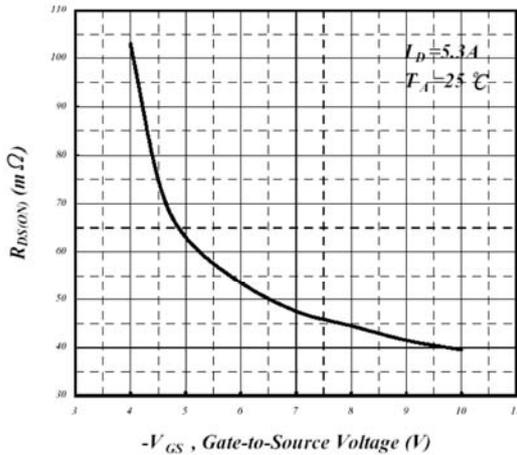


Fig 3. On-Resistance v.s. Gate Voltage

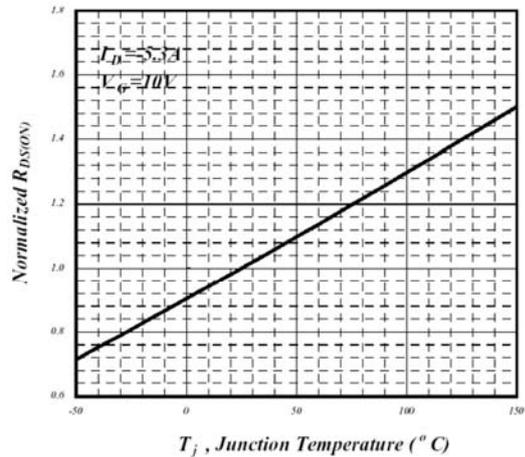


Fig 4. Normalized On-Resistance v.s. Junction Temperature

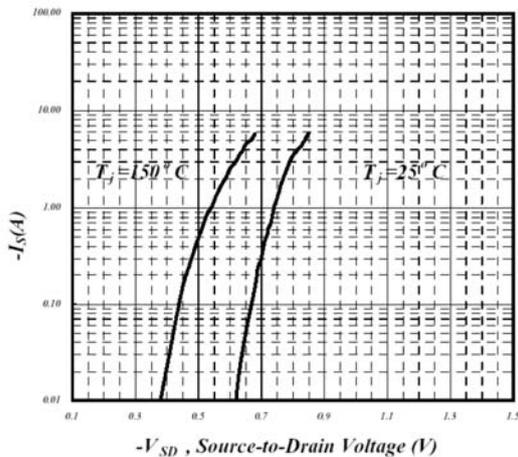


Fig 5. Forward Characteristics of Reverse Diode

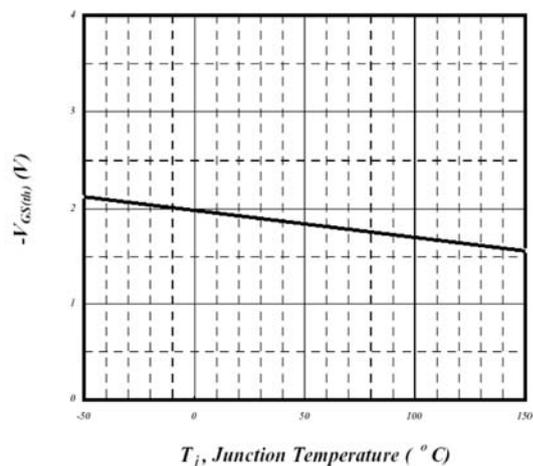


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

CHARACTERISTIC CURVES

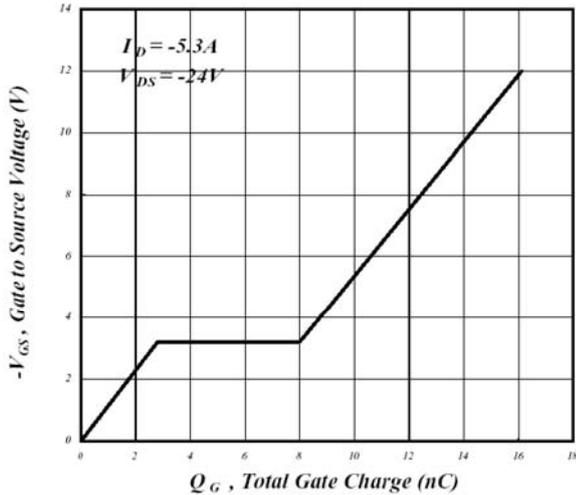


Fig 7. Gate Charge Characteristics

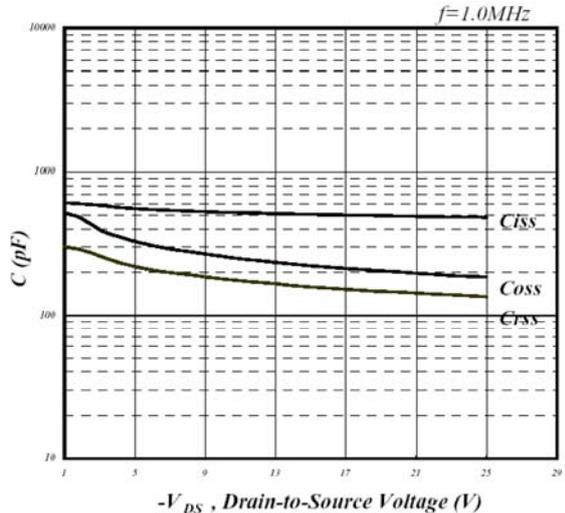


Fig 8. Typical Capacitance Characteristics

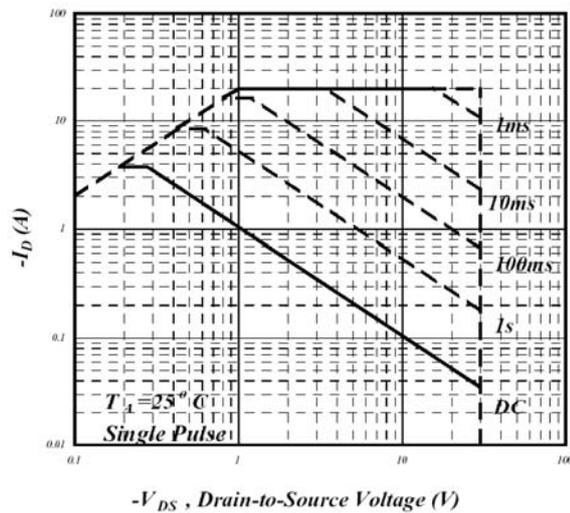


Fig 9. Maximum Safe Operating Area

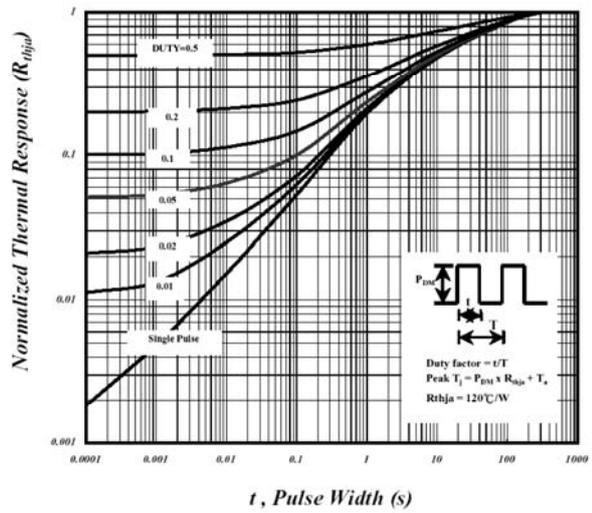


Fig 10. Effective Transient Thermal Impedance

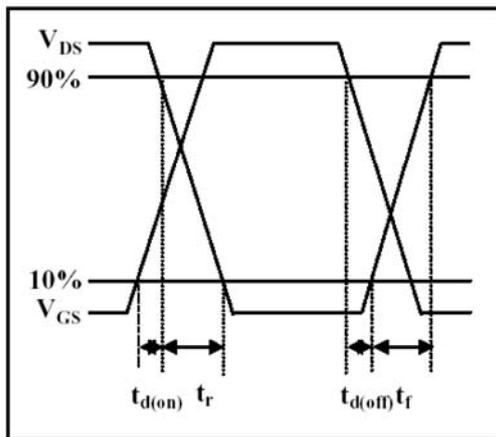


Fig 11. Switching Time Circuit

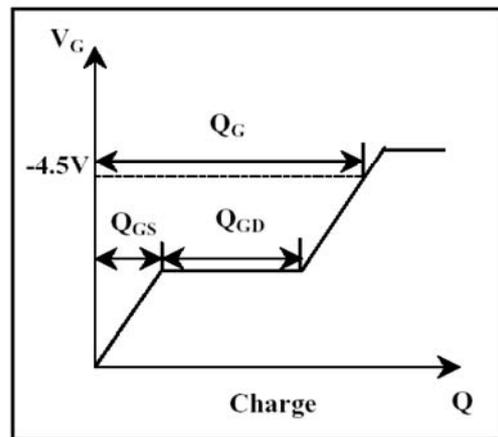


Fig 12. Gate Charge Waveform