

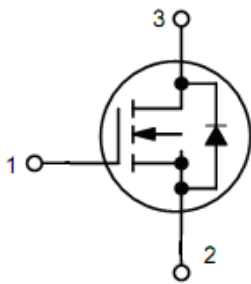
**SE2102M**  
**Small Signal MOSFET**  
**20 V, 600 mA, Single N-Channel MOSFET**

**General Description**  
The MOSFETs from SINO-IC provide the best combination of fast switching, low on-resistance and cost-effectiveness.

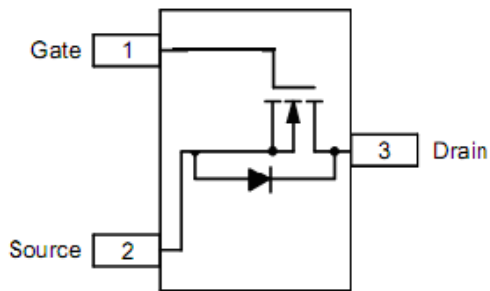
- Features**
- $V_{DS(V)} = 20V$
  - $I_D = 600mA$
  - $R_{DS(ON)} < 350m\Omega$  ( $V_{GS} = 4.5V$ )
  - $R_{DS(ON)} < 470m\Omega$  ( $V_{GS} = 2.5V$ )

**Pin configurations**

See Diagram below



N-Channel MOSFET



SOT-723

**MAXIMUM RATINGS ( $T_J=25^\circ C$  unless otherwise noted)**

Parameter			Symbol	Value	Units
Drain-to-Source Voltage			$V_{DSS}$	20	V
Gate-to-Source Voltage			$V_{GS}$	$\pm 6.0$	V
Continuous Drain Current (Note 1)	Steady State	$T_A = 25^\circ C$	$I_D$	600	mA
		$T_A = 85^\circ C$		400	
Power Dissipation (Note 1)	Steady State		$P_D$	170	mW
Pulsed Drain Current	$t_p = 10 \mu s$		$I_{DM}$	1	A
Operating Junction and Storage Temperature			$T_J$	-55 to	$^\circ C$
			$T_{STG}$	150	
Continuous Source Current (Body Diode)			$I_S$	250	mA
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)			$T_L$	260	$^\circ C$

## SE2102M

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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#### OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	20	26		V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}, V_{DS} = 16\text{ V}$			100	nA
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 4.5\text{ V}$			$\pm 1.0$	$\mu\text{A}$

#### ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\ \mu\text{A}$	0.45		0.9	V
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 4.5\text{ V}, I_D = 600\text{ mA}$		280	350	$\text{m}\Omega$
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = 2.5\text{ V}, I_D = 500\text{ mA}$		370	470	$\text{m}\Omega$
		$V_{GS} = 1.8\text{ V}, I_D = 350\text{ mA}$		650	900	
Forward Transconductance	$g_{FS}$	$V_{DS} = 10\text{ V}, I_D = 400\text{ mA}$		1.2		S

#### CHARGES AND CAPACITANCES

Input Capacitance	$C_{ISS}$	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz},$ $V_{DS} = 16\text{ V}$		130		pF
Output Capacitance	$C_{OSS}$			21		
Reverse Transfer Capacitance	$C_{RSS}$			15		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = 4.5\text{ V}, V_{DS} = 10\text{ V},$ $I_D = 0.25\text{ A}$		1.4		nC
Gate-to-Source Charge	$Q_{GS}$			0.35		
Gate-to-Drain Charge	$Q_{GD}$			0.55		

#### SWITCHING CHARACTERISTICS (Note 3)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = 4.5\text{ V}, V_{DD} = 10\text{ V},$ $I_D = 0.2\text{ A}, R_G = 10\ \Omega$		6		ns
Rise Time	$t_r$			6		
Turn-Off Delay Time	$t_{d(OFF)}$			25		
Fall Time	$t_f$			13		

#### DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	$V_{SD}$	$V_{GS} = 0\text{ V},$ $I_S = 200\text{ mA}$	$T_J = 25^\circ\text{C}$		0.69	1.1	V
			$T_J = 125^\circ\text{C}$		0.58		

# Typical Electrical Characteristics

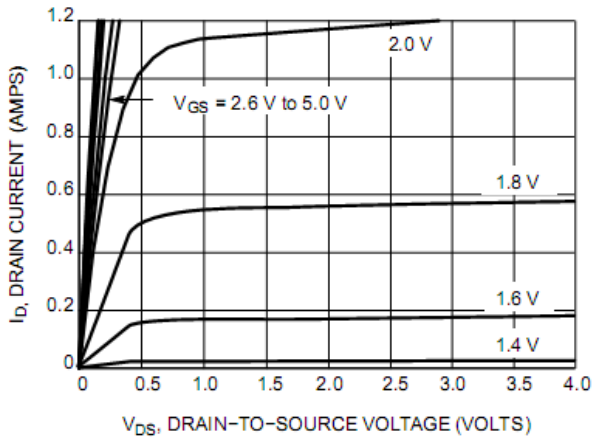


Figure 1. On-Region Characteristics

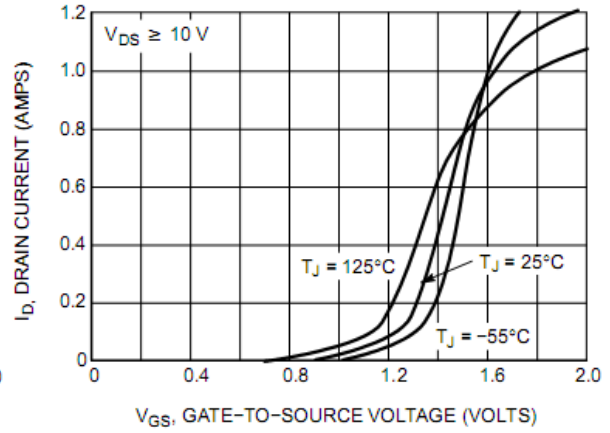


Figure 2. Transfer Characteristics

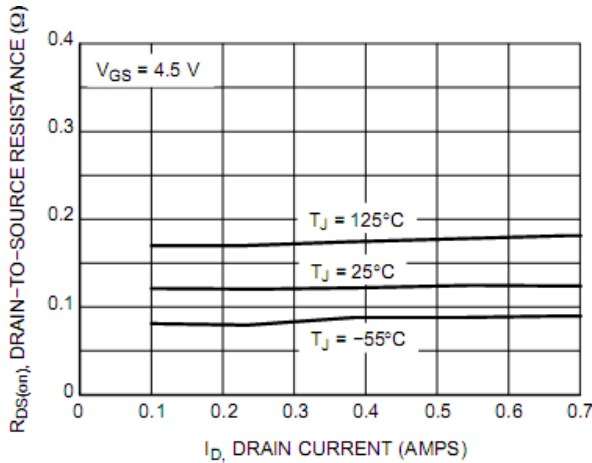


Figure 3. On-Resistance vs. Drain Current and Temperature

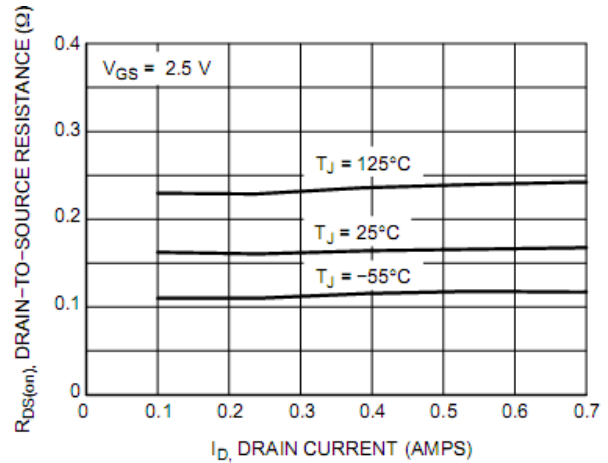


Figure 4. On-Resistance vs. Drain Current and Temperature

### Typical Electrical Characteristics

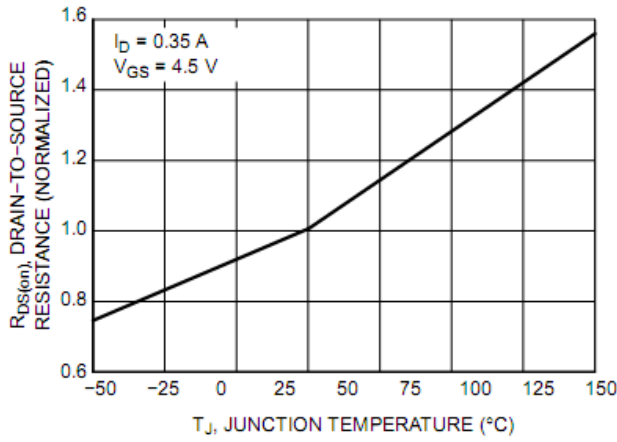


Figure 5. On-Resistance Variation with Temperature

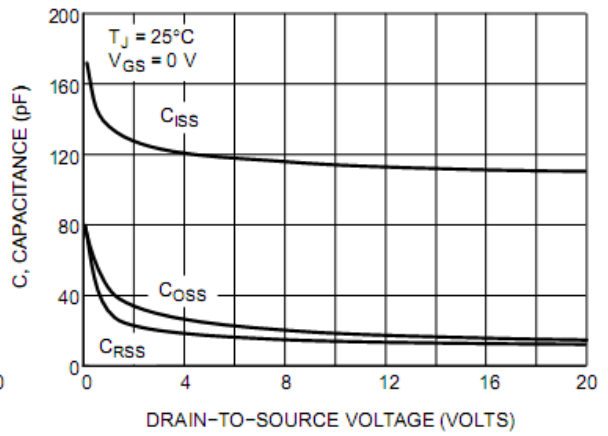


Figure 6. Capacitance Variation

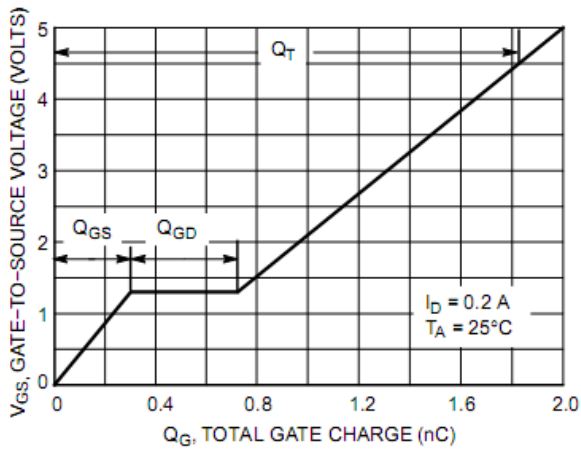


Figure 7. Gate-to-Source Voltage vs. Total Gate Charge

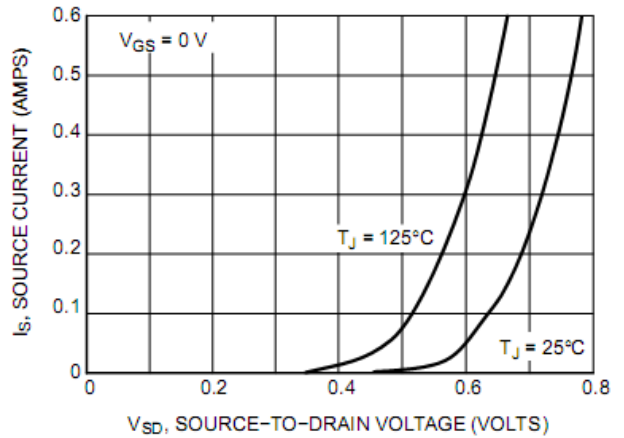


Figure 8. Diode Forward Voltage vs. Current

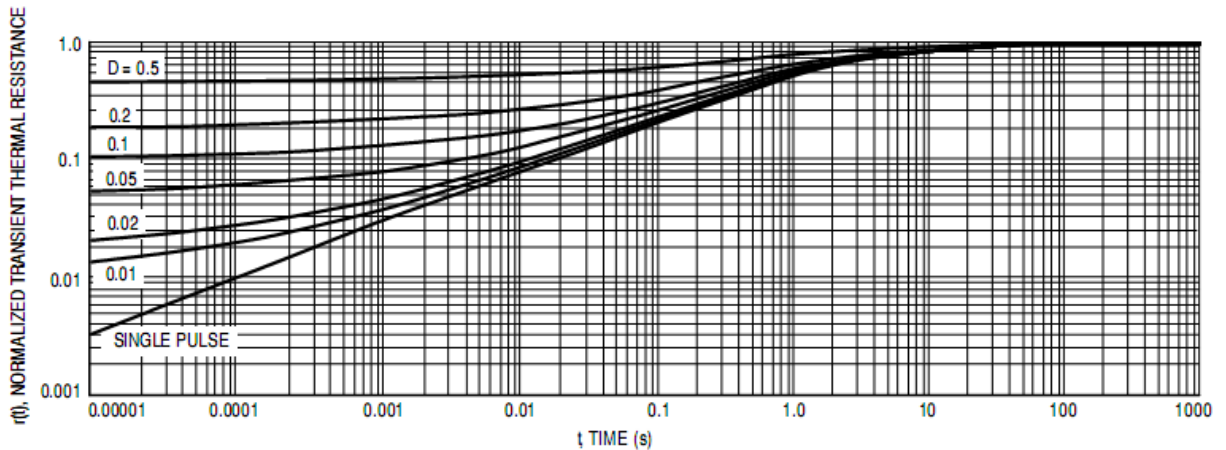
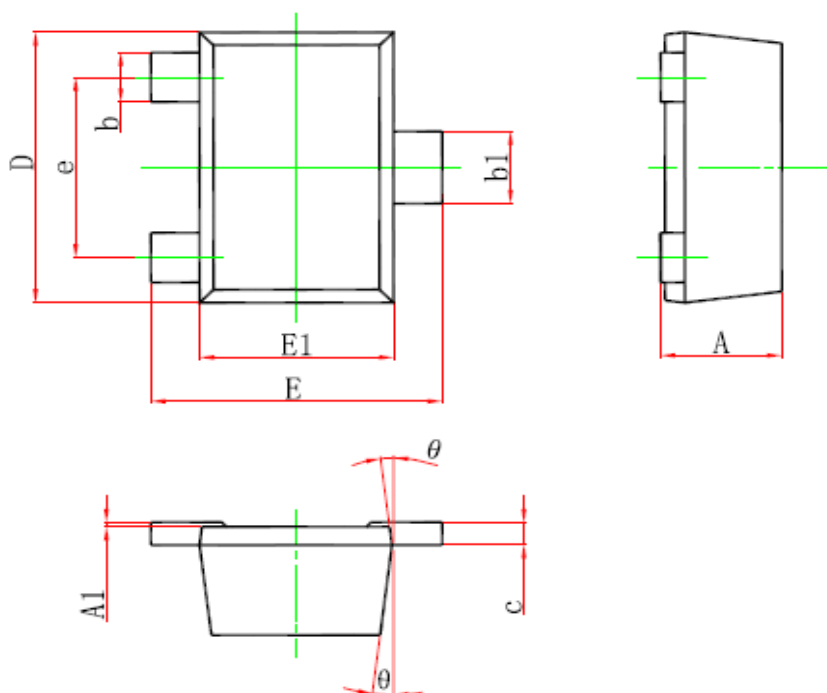


Figure 9. Normalized Thermal Response

## Package Dimensions(SOT-723)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A		0.500		0.020
A1	0.000	0.050	0.000	0.002
b	0.170	0.270	0.007	0.011
b1	0.270	0.370	0.011	0.015
c		0.150		0.006
D	1.150	1.250	0.045	0.049
E	1.150	1.250	0.045	0.049
E1	0.750	0.850	0.030	0.033
e	0.800TYP.		0.031TYP.	
θ	7° REF.		7° REF.	

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