

Small Signal MOSFET

115 mAmps, 60 Volts N-Channel SOT-323

FEATURES

- 1) We declare that the material of product compliant with RoHS requirements and Halogen Free.
- 2) ESD Protected: 1000V
- 3) S- Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

ORDERING INFORMATION

Device	Marking	Shipping
2N7002WT1	6C	3000/Tape&Reel
2N7002WT3	6C	10000/Tape&Reel

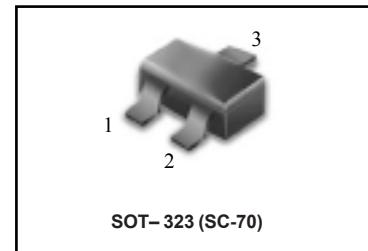
MAXIMUM RATINGS($T_a = 25^\circ\text{C}$)

Rating	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	Vdc
Drain-Gate Voltage ($R_{GS} = 1.0 \text{ M}\Omega$)	V_{DGR}	60	Vdc
Drain Current			mAdc
– Continuous $T_c = 25^\circ\text{C}$ (Note 1.)	I_D	± 115	
$T_c = 100^\circ\text{C}$ (Note 1.)	I_D	± 75	
– Pulsed (Note 2.)	I_{DM}	± 800	
Gate-Source Voltage	V_{GS}	± 20	Vdc
– Continuous	V_{GSM}	± 40	Vpk
– Non-repetitive ($t_p \leq 50 \mu\text{s}$)			

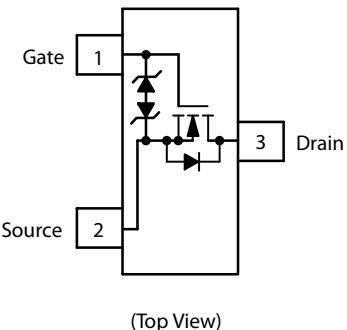
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 3.) $T_A = 25^\circ\text{C}$	P_D	225	mW
Derate above 25°C		1.8	$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	556	$^\circ\text{C}/\text{W}$
Total Device Dissipation Alumina Substrate, (Note 4.) $T_A = 25^\circ\text{C}$	P_D	300	mW
Derate above 25°C		2.4	$\text{mW}/^\circ\text{C}$
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	417	$^\circ\text{C}/\text{W}$
Junction and Storage Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

2N7002WT1
S-2N7002WT1



Simplified Schematic



1. The Power Dissipation of the package may result in a lower continuous drain current.

2. Pulse Test: Pulse Width $\leq 300 \mu\text{s}$, Duty Cycle $\leq 2.0\%$.

3. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

4. Alumina = $0.4 \times 0.3 \times 0.025$ in 99.5% alumina.

2N7002WT1,S-2N7002WT1

ELECTRICAL CHARACTERISTICS (Ta= 25°C)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
OFF CHARACTERISTICS					
Drain–Source Breakdown Voltage (V _{GS} = 0, I _D = 10 µAdc)	V _{(BR)DSS}	60	–	–	Vdc
Zero Gate Voltage Drain Current T _J = 25°C (V _{GS} = 0, V _{DS} = 60 Vdc) T _J = 125°C	I _{DSS}	–	–	1.0 500	µAdc
Gate–Body Leakage Current, Forward (V _{GS} = 20 Vdc)	I _{GSSF}	–	–	1	µAdc
Gate–Body Leakage Current, Reverse (V _{GS} = – 20 Vdc)	I _{GSSR}	–	–	-1	µAdc

ON CHARACTERISTICS (Note 2.)

Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 250uAdc)	V _{GS(th)}	1.0	1.6	2.5	Vdc
On–State Drain Current (V _{DS} ≥ 2.0 V _{DS(on)} , V _{GS} = 10 Vdc)	I _{D(on)}	500	–	–	mA
Static Drain–Source On–State Voltage (V _{GS} = 10 Vdc, ID = 500 mA) (V _{GS} = 5.0 Vdc, I _D = 50 mA)	V _{DS(on)}	–	–	3.75 0.375	Vdc
Static Drain–Source On–State Resistance (V _{GS} = 10 V, I _D = 500 mA) T _C = 25°C T _C = 125°C (V _{GS} = 5.0 Vdc, I _D = 50 mA) T _C = 25°C T _C = 125°C	r _{DS(on)}	–	1.4 – – –	7.5 13.5 7.5 13.5	Ohms
Forward Transconductance (V _{DS} ≥ 2.0 V _{DS(on)} , I _D = 200 mA)	g _{FS}	80	–	–	mmhos

DYNAMIC CHARACTERISTICS

Input Capacitance (V _{DS} = 25 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{iss}	–	17	50	pF
Output Capacitance (V _{DS} = 25 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{oss}	–	10	25	pF
Reverse Transfer Capacitance (V _{DS} = 25 Vdc, V _{GS} = 0, f = 1.0 MHz)	C _{rss}	–	2.5	5.0	pF

SWITCHING CHARACTERISTICS (Note 2.)

Turn–On Delay Time	(V _{DD} = 25 Vdc , I _D =500 mA, R _G = 25 Ω, , R _L = 50 Ω, , V _{gen} = 10 V)	td(on)	–	7	20	ns
Turn–Off Delay Time		td(off)	–	11	40	ns

BODY–DRAIN DIODE RATINGS

Diode Forward On–Voltage (I _s = 115 mA, V _{GS} = 0 V)	V _{SD}	–	–	-1.5	Vdc
Source Current Continuous (Body Diode)	I _S	–	–	-115	mA
Source Current Pulsed	I _{SM}	–	–	-800	mA

2. Pulse Test: Pulse Width ≤ 300 µs, Duty Cycle ≤ 2.0%.

2N7002WT1, S-2N7002WT1

ELECTRICAL CHARACTERISTIC CURVES

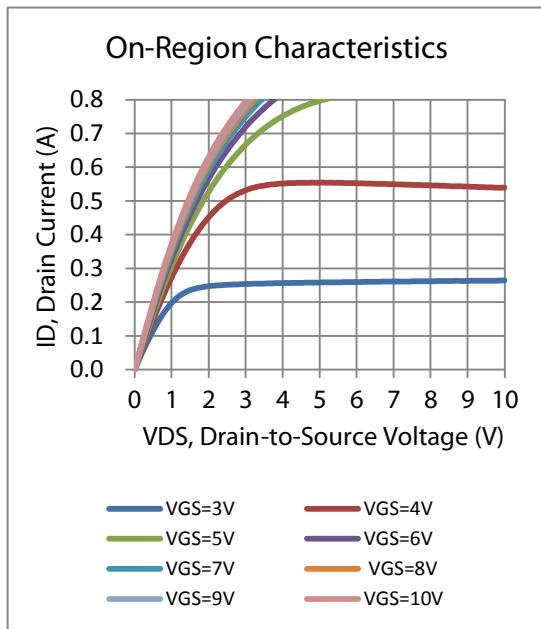


FIG1

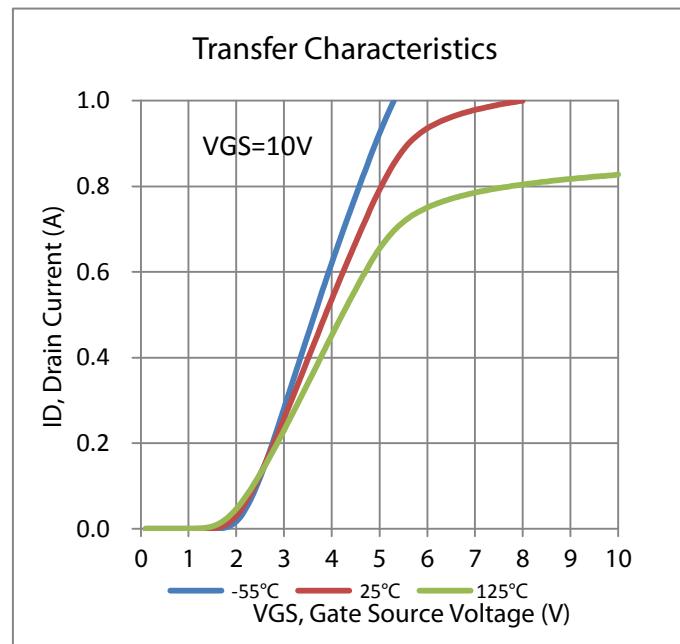


FIG2

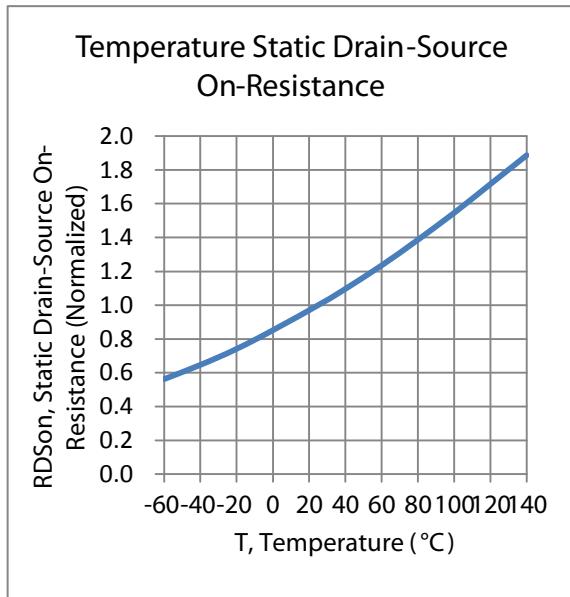


FIG3

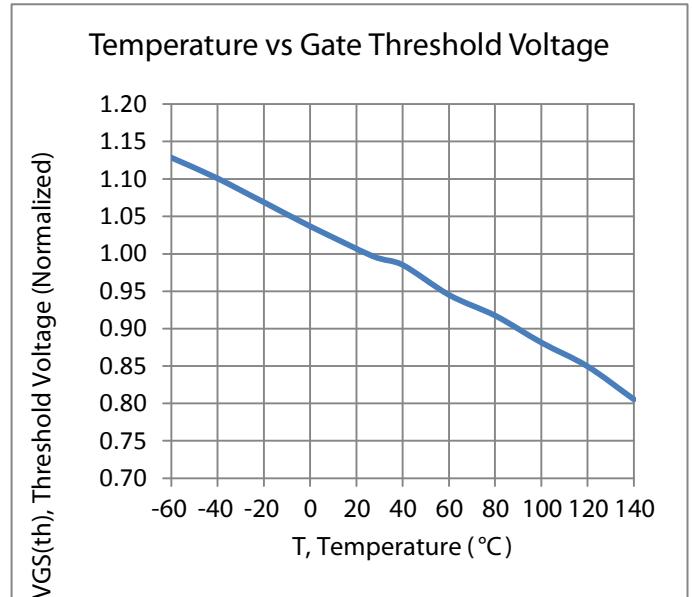
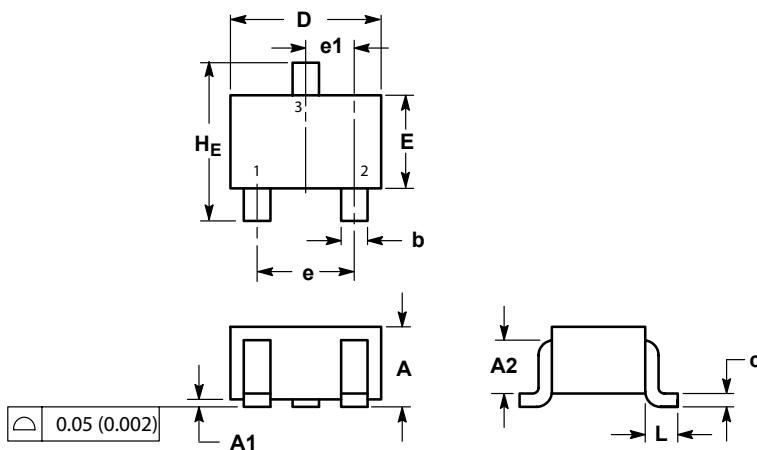


FIG4

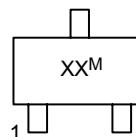
2N7002WT1,S-2N7002WT1

SC-70 (SOT-323)



NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.7	REF		0.028	REF	
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	0.047	0.051	0.055
e1	0.65	BSC		0.026	BSC	
L	0.425	REF		0.017	REF	
HE	2.00	2.10	2.40	0.079	0.083	0.095

GENERIC
MARKING DIAGRAM

XX = Specific Device Code
 M = Date Code
 ■ = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking.
 Pb-Free indicator, "G" or microdot "■", may or may not be present.

