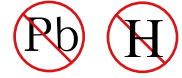


**N-Channel Enhancement MOSFET****V_{DS} = 60V, I_D = 115mA****FEATURES**

- We declare that the material of product compliance with RoHS requirements and Halogen Free.

MARKING

6C

PACKAGE INFORMATION

Package	Shipping
SOT-323	3000/Tape&Reel

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V _{dc}
Drain-Gate Voltage (R _{GS} = 1.0 MΩ)	V _{DGR}	60	V _{dc}
Drain Current - Continuous T _C = 25°C (Note 1.) T _C = 100°C (Note 1.) - Pulsed (Note 2.)	I _D I _D I _{DM}	±115 ±75 ±800	mAdc
Gate-Source Voltage - Continuous - Non-repetitive (t _p ≤ 50 μs)	V _{GS} V _{GSM}	±20 ±40	V _{dc} V _{pk}

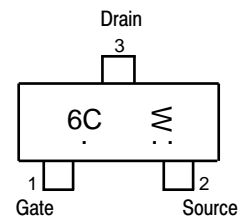
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (Note 3.) T _A = 25°C Derate above 25°C	P _D	225 1.8	mW mW/°C
Thermal Resistance, Junction to Ambient	R _{θJA}	556	°C/W
Total Device Dissipation Alumina Substrate, (Note 4.) T _A = 25°C Derate above 25°C	P _D	300 2.4	mW mW/°C
Thermal Resistance, Junction to Ambient	R _{θJA}	417	°C/W
Junction and Storage Temperature	T _J , T _{stg}	-55 to +150	°C

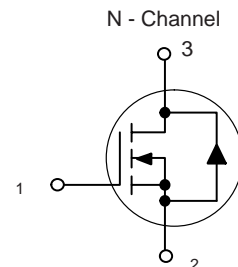
1. The Power Dissipation of the package may result in a lower continuous drain current.
2. Pulse Test: Pulse Width ≤ 300 μs, Duty Cycle ≤ 2.0%.
3. FR-5 = 1.0 x 0.75 x 0.062 in.
4. Alumina = 0.4 x 0.3 x 0.025 in 99.5% alumina.

MARKING DIAGRAM & PIN ASSIGNMENT

SOT-323 (SC-70)



6C = Device Code
M = Work Week

115 mAmps**60 VOLTS****R_{DS(on)} = 7.5 Ω**

2N7002W

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

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain–Source Breakdown Voltage ($V_{GS} = 0, I_D = 10 \mu\text{Adc}$)	$V_{(BR)DSS}$	60	–	–	Vdc
Zero Gate Voltage Drain Current ($V_{GS} = 0, V_{DS} = 60 \text{ Vdc}$)	I_{DSS}	– –	– –	1.0 500	μAdc
Gate–Body Leakage Current, Forward ($V_{GS} = 20 \text{ Vdc}$)	I_{GSSF}	–	–	100	nAdc
Gate–Body Leakage Current, Reverse ($V_{GS} = -20 \text{ Vdc}$)	I_{GSSR}	–	–	-100	nAdc

ON CHARACTERISTICS (Note 2.)

Gate Threshold Voltage ($V_{DS} = V_{GS}, I_D = 250 \mu\text{Adc}$)	$V_{GS(th)}$	1.0	1.6	2.5	Vdc
On–State Drain Current ($V_{DS} \geq 2.0 V_{DS(on)}, V_{GS} = 10 \text{ Vdc}$)	$I_{D(on)}$	500	–	–	mA
Static Drain–Source On–State Voltage ($V_{GS} = 10 \text{ Vdc}, I_D = 500 \text{ mAdc}$) ($V_{GS} = 5.0 \text{ Vdc}, I_D = 50 \text{ mAdc}$)	$V_{DS(on)}$	– –	– –	3.75 0.375	Vdc
Static Drain–Source On–State Resistance ($V_{GS} = 10 \text{ V}, I_D = 500 \text{ mAdc}$) $T_C = 25^\circ\text{C}$ ($V_{GS} = 10 \text{ V}, I_D = 500 \text{ mAdc}$) $T_C = 125^\circ\text{C}$ ($V_{GS} = 5.0 \text{ Vdc}, I_D = 50 \text{ mAdc}$) $T_C = 25^\circ\text{C}$ ($V_{GS} = 5.0 \text{ Vdc}, I_D = 50 \text{ mAdc}$) $T_C = 125^\circ\text{C}$	$r_{DS(on)}$	– – – –	1.4 – 1.8 –	7.5 13.5 7.5 13.5	Ohms
Forward Transconductance ($V_{DS} \geq 2.0 V_{DS(on)}, I_D = 200 \text{ mAdc}$)	g_{FS}	80	–	–	mmhos

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$)	C_{iss}	–	17	50	pF
Output Capacitance ($V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$)	C_{oss}	–	10	25	pF
Reverse Transfer Capacitance ($V_{DS} = 25 \text{ Vdc}, V_{GS} = 0, f = 1.0 \text{ MHz}$)	C_{rss}	–	2.5	5.0	pF

SWITCHING CHARACTERISTICS (Note 2.)

Turn–On Delay Time	$(V_{DD} = 25 \text{ Vdc}, I_D \cong 500 \text{ mAdc}, R_G = 25 \Omega, R_L = 50 \Omega, V_{gen} = 10 \text{ V})$	$t_{d(on)}$	–	7	20	ns
Turn–Off Delay Time		$t_{d(off)}$	–	11	40	ns

BODY–DRAIN DIODE RATINGS

Diode Forward On–Voltage ($I_S = 11.5 \text{ mAdc}, V_{GS} = 0 \text{ V}$)	V_{SD}	–	–	-1.5	Vdc
Source Current Continuous (Body Diode)	I_S	–	–	-115	mAdc
Source Current Pulsed	I_{SM}	–	–	-800	mAdc

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

DEVICE CHARACTERISTICS

2N7002W

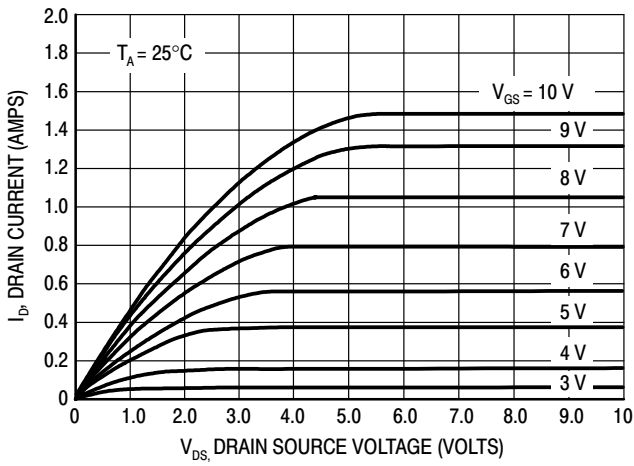


Figure 1. Ohmic Region

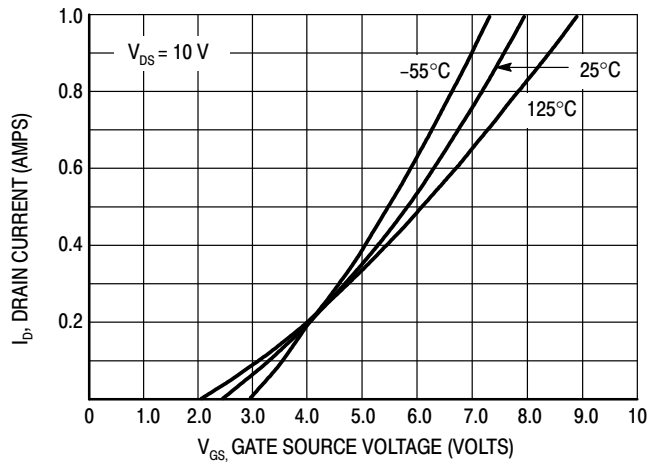


Figure 2. Transfer Characteristics

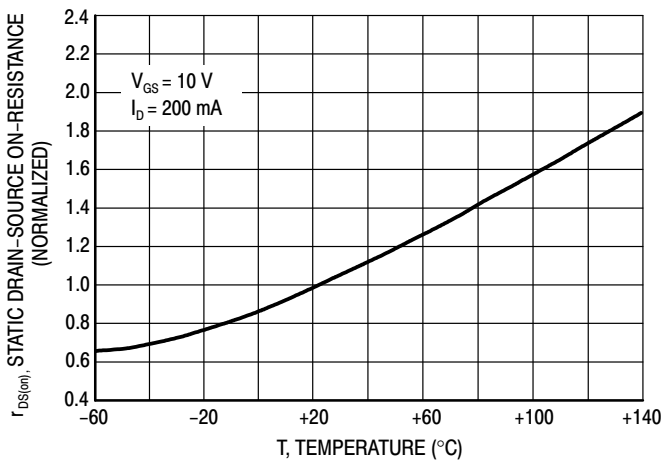


Figure 3. Temperature versus Static Drain-Source On-Resistance

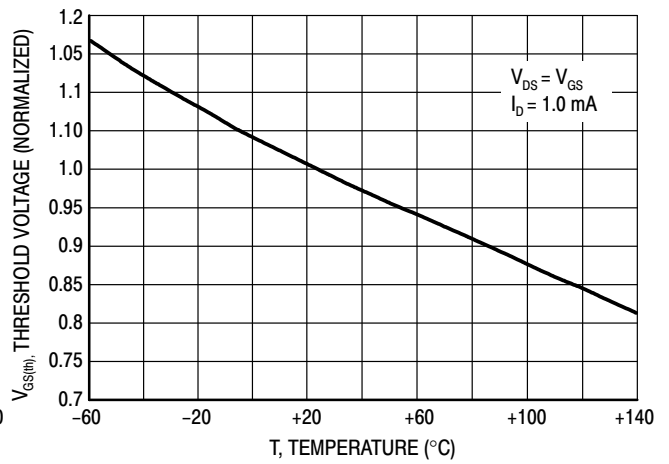


Figure 4. Temperature versus Gate Threshold Voltage

PACKAGE OUTLINE & DIMENSIONS

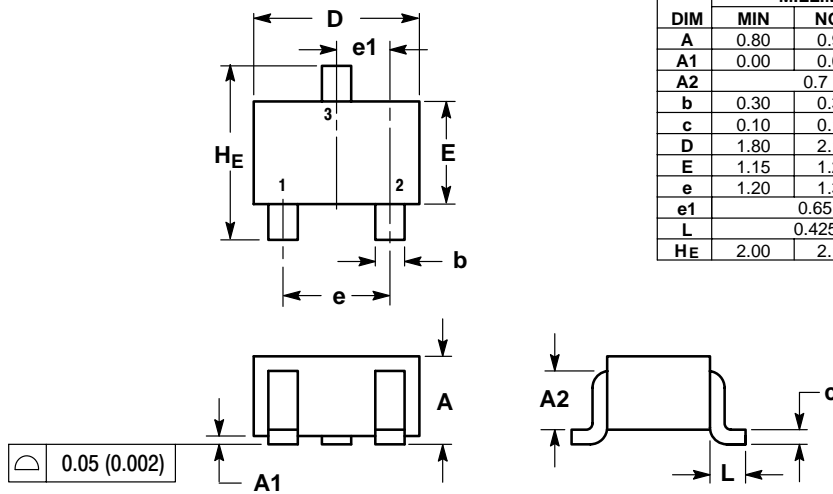
2N7002W

SOT-323 (SC-70)

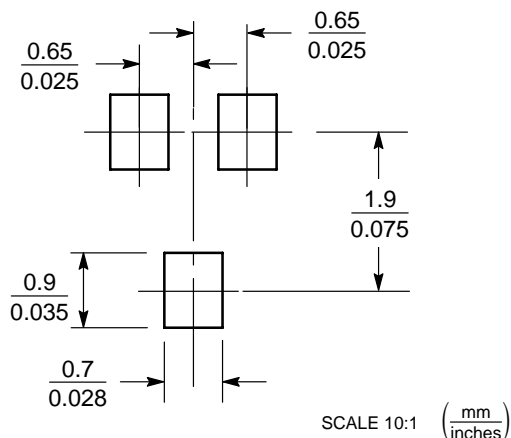
NOTES:

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

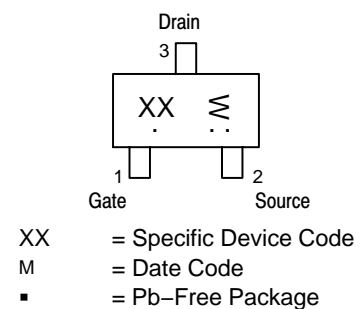
DIM	MILLIMETERS			INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	0.80	0.90	1.00	0.032	0.035	0.040
A1	0.00	0.05	0.10	0.000	0.002	0.004
A2	0.7 REF			0.028 REF		
b	0.30	0.35	0.40	0.012	0.014	0.016
c	0.10	0.18	0.25	0.004	0.007	0.010
D	1.80	2.10	2.20	0.071	0.083	0.087
E	1.15	1.24	1.35	0.045	0.049	0.053
e	1.20	1.30	1.40	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



SOLDERING FOOTPRINT*



GENERIC MARKING DIAGRAM



*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.