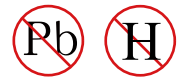


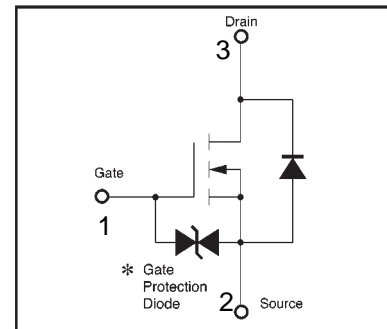
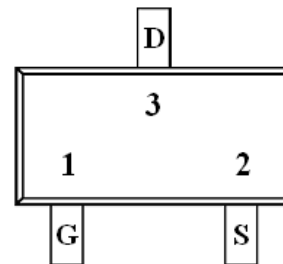


N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR



- Low On-Resistance
- Fast Switching Speed
- Low-voltage drive
- Easily designed drive circuits
- Can protect against static electricity 1KV when the product is in use.

SOT-323 (SC-70)



* A protection diode has been built in between the gate and the source to protect against static electricity when the product is in use. Use the protection circuit when fixed voltages are exceeded.

Maximum Ratings @ TA=25°C unless otherwise specified

Characteristic		Symbol	Value	Unit
Drain-Source Voltage		VDSS	60	V
Gate-Source Voltage		VGSS	±20	V
Drain Current	Continuous	ID	115	mA
	Pulsed	IDP *1	800	mA
Reverse drain current	Continuous	IDR	115	mA
	Pulsed	IDRP *1	800	mA
Total Power Dissipation		Pd *2	225	mW
Channel temperature		Tch	150	°C
Storage Temperature Range		Tstg	-55 to +150	°C

* 1 PW 10uS, Duty cycle 1%.

* 2 When mounted on a 1*0.75*0.062 inch glass epoxy board.

DEVICE CHARACTERISTICS

2N7002EW

Electrical Characteristics @ $T_A=25^{\circ}\text{C}$ unless otherwise specified, per element

Characteristic	Symbol	Min	Typ	MAX	Unit	Test Condition
OFF CHARACTERISTICS(Note 2)						
Drain-Source Breakdown Voltage	V(BR)DSS	60			V	VGS=0V, ID=10μA
Zero Gate Voltage Drain Current	IDSS			1.0	μA	VDS=60V, VGS=0V
Gate-source Leakage	IGSS			±10	μA	VGS=±20V, VDS=0V
ON CHARACTERISTICS(Note 2)						
Gate Threshold Voltage	VGS(th)	1.0	1.85	2.5	V	VDS=10V, ID=1mA
Static Drain-Source On-Resistance	RDS(ON)			7.5	Ω	VGS=10V, ID =0.5A
				7.5		VGS=10V, ID=0.05A
Forward transfer admittance	gfs *	80			mS	VDS=10V, ID=0.2A
DYNAMIC CHARACTERISTICS						
Input Capacitance	CiSS		25	50	pF	VDS=25V
Output Capacitance	COSS		10	25	pF	VGS=0V
Reverse Transfer Capacitance	CrSS		3.0	5.0	pF	f=1.0MHz
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	TD(ON) *		12	20	nS	ID=0.2A, VDD=30V,
Turn-Off Delay Time	TD(OFF)*		20	30	nS	VGS=10v, RL=150Ω, RG=10Ω

* $P_w \leq 300 \mu s$, Duty cycle $\leq 1\%$

DEVICE CHARACTERISTICS

2N7002EW

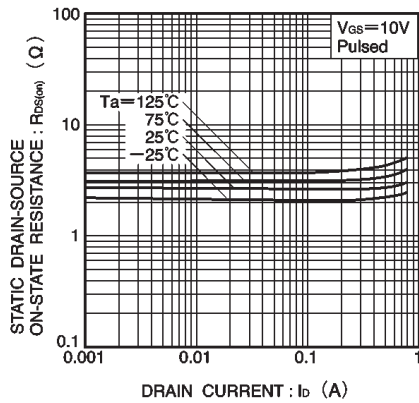


Fig.4 Static drain-source on-state resistance vs. drain current (I)

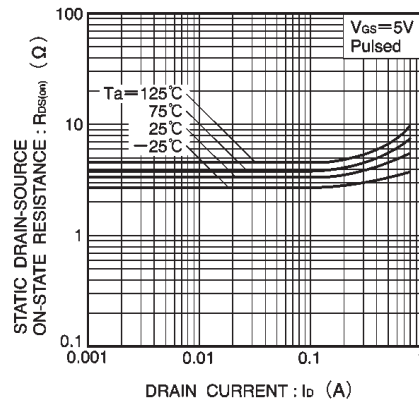


Fig.5 Static drain-source on-state resistance vs. drain current (II)

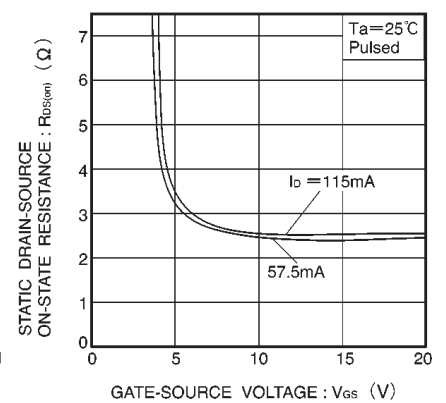


Fig.6 Static drain-source on-state resistance vs. gate-source voltage

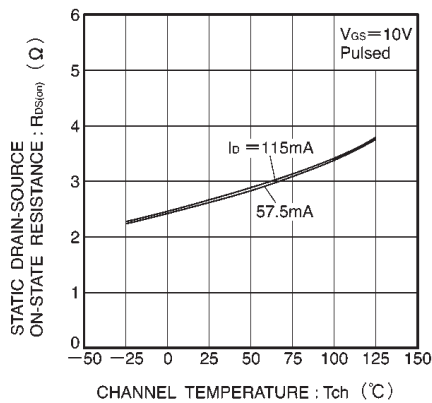


Fig.7 Static drain-source on-state resistance vs. channel temperature

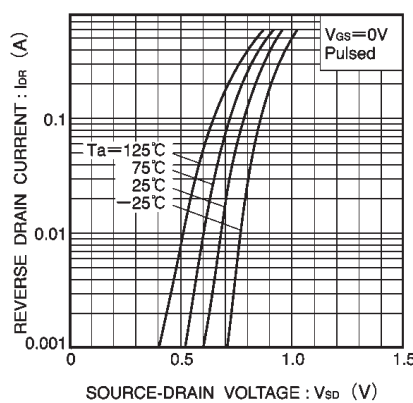


Fig.8 Reverse drain current vs. source-drain voltage (I)

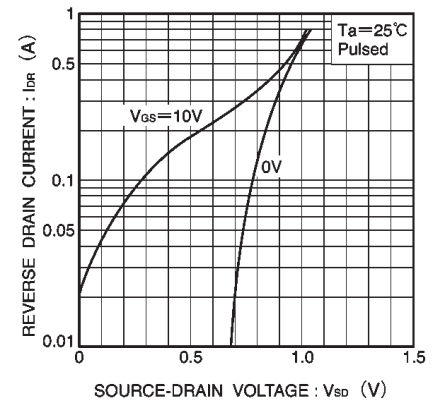


Fig.9 Reverse drain current vs. source-drain voltage (II)

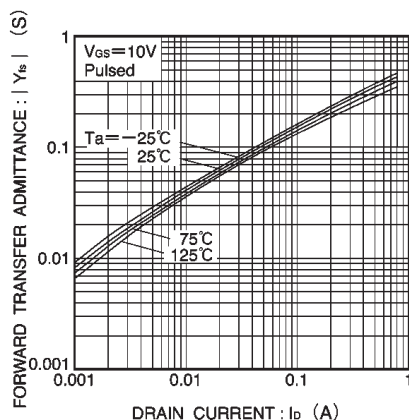


Fig.10 Forward transfer admittance vs. drain current

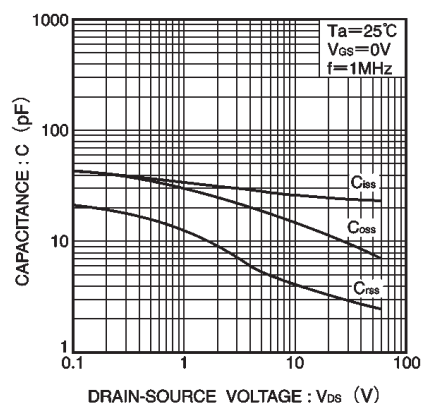


Fig.11 Typical capacitance vs. drain-source voltage

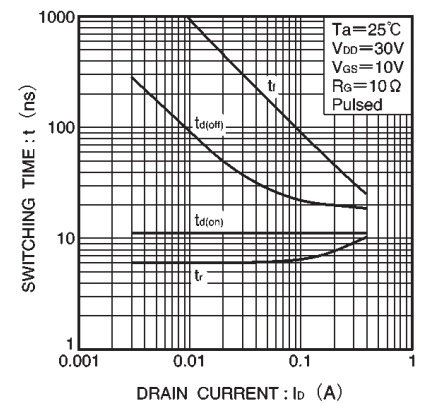
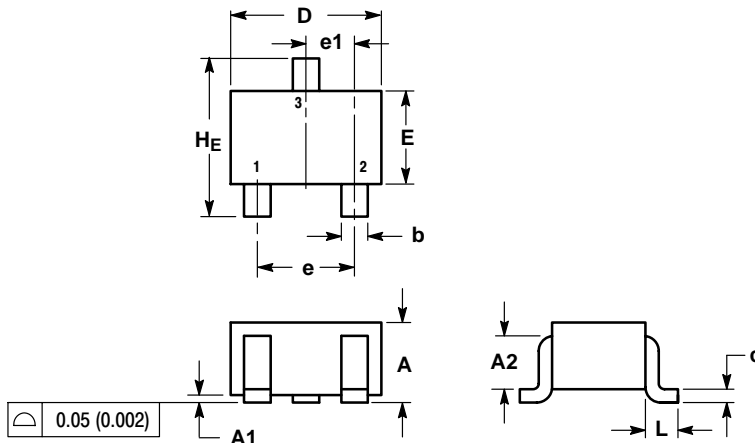


Fig.12 Switching characteristics
(See Figures 13 and 14 for the measurement circuit and resultant waveforms)

PACKAGE OUTLINE & DIMENSIONS

2N7002EW

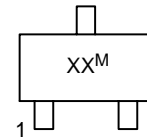
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- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.

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		
H	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.

SOLDERING FOOTPRINT*

