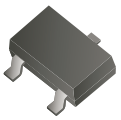
2N7002W-HF

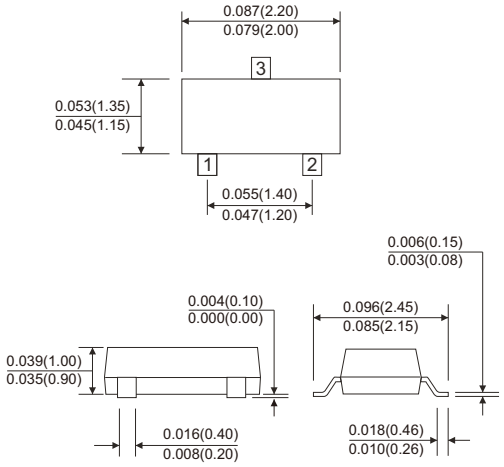
N-Channel
RoHS Device
Halogen Free



Features

- High density cell design for low $R_{DS(ON)}$.
- Voltage controlled small signal switch.
- Rugged and reliable.
- High saturation current capability.

SOT-323



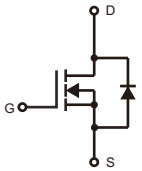
Dimensions in inches and (millimeter)

Mechanical data

- Case: SOT-323, molded plastic.
- Mounting position: Any.

Circuit Diagram

1. G: Gate
2. S: Source
3. D: Drain



Maximum Ratings (at T_A=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	±20	V
Continuous drain current	I_D	115	mA
Power dissipation	P_D	200	mW
Thermal resistance from junction to ambient	$R_{\theta JA}$	625	°C/W
Junction temperature	T_J	150	°C
Storage temperature range	T_{STG}	-55 to +150	°C

Electrical Characteristics (at T_A=25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Drain-source breakdown voltage	V_{GS} = 0V, I_D = 250μA	$V_{(BR)DSS}$	60			V
Gate-threshold voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{(GS)th}$	1	1.6	2.5	V
Gate-body leakage	V_{DS} = 0V, V_{GS} = ±20V	I_{GSS}			±80	nA
Zero gate voltage drain current	V_{DS} = 60V, V_{GS} = 0V	I_{DSS}			80	nA
On-state drain current	V_{GS} = 10V, V_{DS} = 7V	$I_{D(ON)}$	500			mA
Drain-source on-resistance	V_{GS} = 10V, I_D = 500mA	$R_{DS(ON)}$		0.9	5	Ω
	V_{GS} = 5V, I_D = 50mA			1.1	7	
Forward transconductance	V_{DS} = 10V, I_D = 200mA	g_{fs}	80			mS
Drain-source on-voltage	V_{GS} = 10V, I_D = 500mA	$V_{DS(ON)}$			3.75	V
	V_{GS} = 5V, I_D = 50mA				0.375	
Diode forward voltage	I_S = 115mA, V_{GS} = 0V	V_{SD}	0.55		1.2	V
Input capacitance (Note 1)	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz	C_{iss}			50	pF
Output capacitance (Note 1)		C_{oss}			25	
Reverse transfer capacitance (Note 1)		C_{rss}			5	
Switching Time						
Turn-on time (Note 1)	V_{DD} = 25V, R_L = 50Ω, I_D = 500mA, V_{GEN} = 10V, R_G = 25Ω	$t_{d(on)}$			20	nS
Turn-off time (Note 1)		$t_{d(off)}$			40	

Note: 1. These parameters have no way to verify.

Rating and Characteristic Curves (2N7002W-HF)

Fig.1 - Output Characteristics

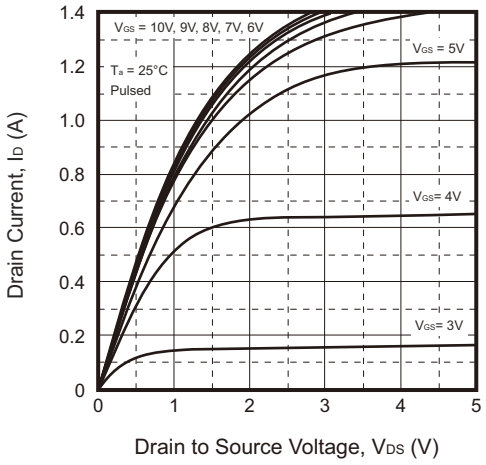


Fig.2 - Transfer Characteristics

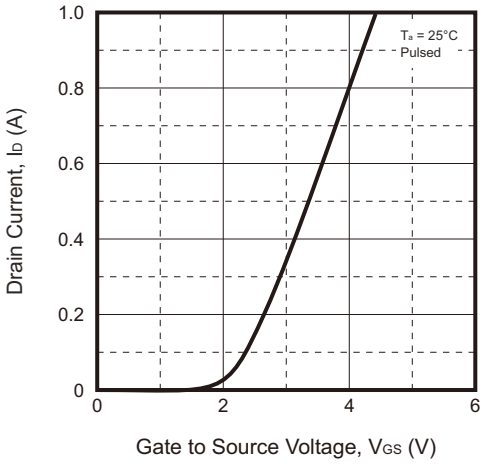


Fig.3 - $R_{DS(ON)}$ — I_D

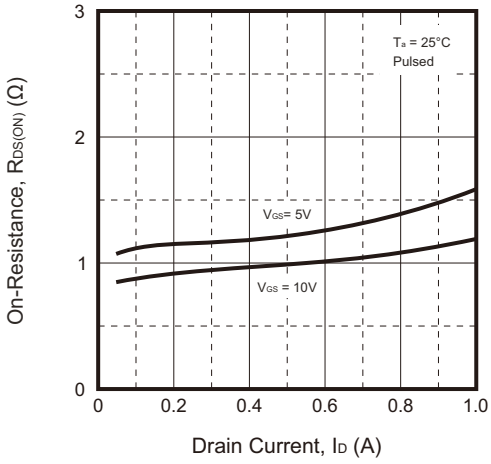


Fig.4 - $R_{DS(ON)}$ — V_{GS}

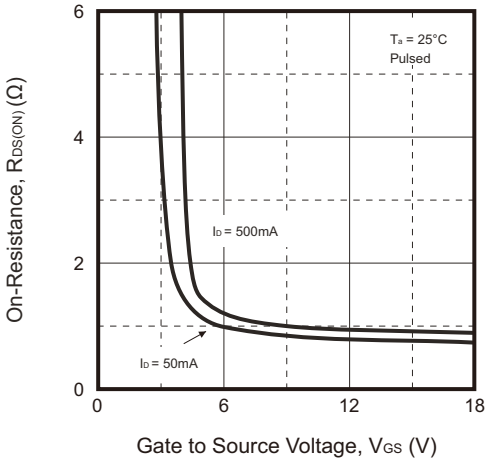
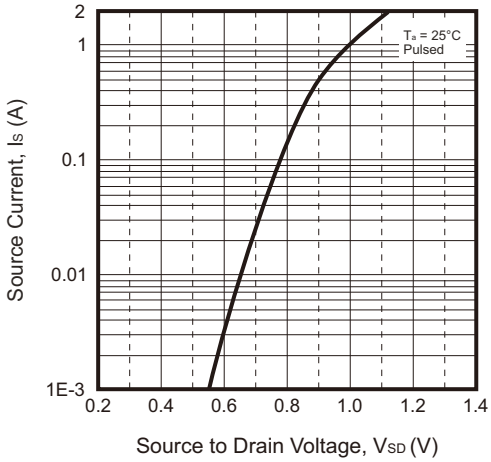
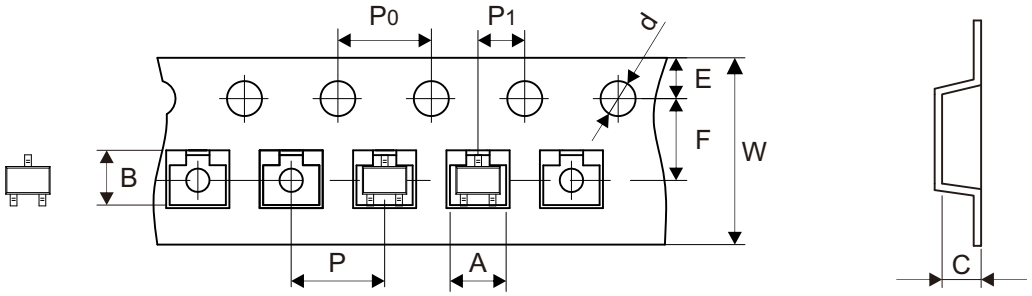
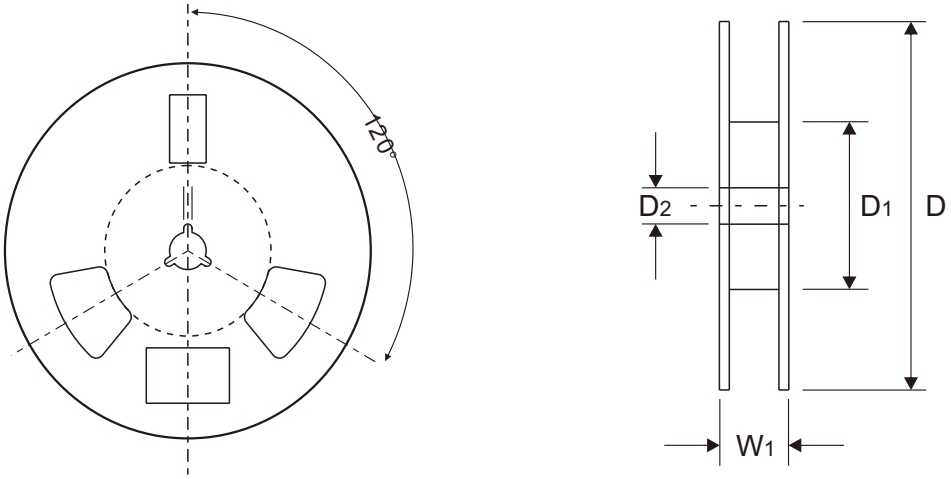


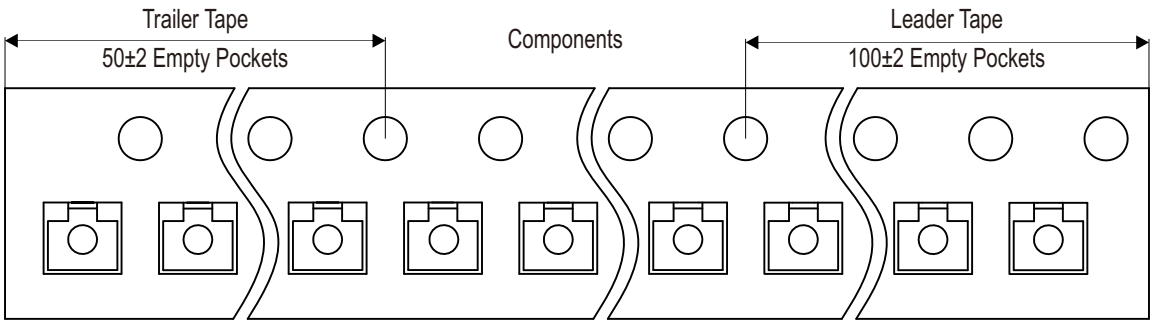
Fig.5 - I_S — V_{SD}



Reel Taping Specification





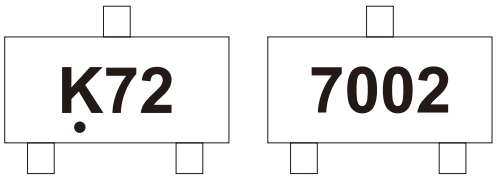


	SYMBOL	A	B	C	d	D	D1	D2
SOT-323	(mm)	2.25 ± 0.05	2.55 ± 0.05	1.19 ± 0.05	1.55 ± 0.10	178.00 ± 2.00	54.40 ± 1.00	13.00 ± 1.00
	(inch)	0.089 ± 0.002	0.100 ± 0.002	0.047 ± 0.002	0.061 ± 0.004	7.008 ± 0.079	2.142 ± 0.039	0.512 ± 0.039

	SYMBOL	E	F	P	P0	P1	W	W1
SOT-323	(mm)	1.75 ± 0.10	3.50 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.10	8.00 + 0.30 − 0.10	12.30 ± 1.00
	(inch)	0.069 ± 0.004	0.138 ± 0.004	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.004	0.315 + 0.012 − 0.004	0.484 ± 0.039

Marking Code

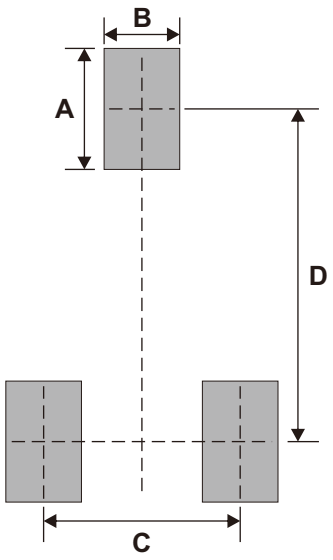
Part Number	Marking Code	
2N7002W-HF	K72	7002



Solid dot = Control code

Suggested P.C.B. PAD Layout

SIZE	SOT-323	
	(mm)	(inch)
A	0.80	0.031
B	0.50	0.020
C	1.30	0.051
D	2.20	0.087



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-323	3,000	7