

2N7002-HF (N-Channel)

RoHS Device

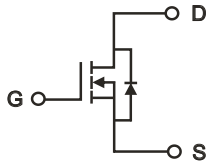


Features

Halogen free.

Power dissipation : 0.35W

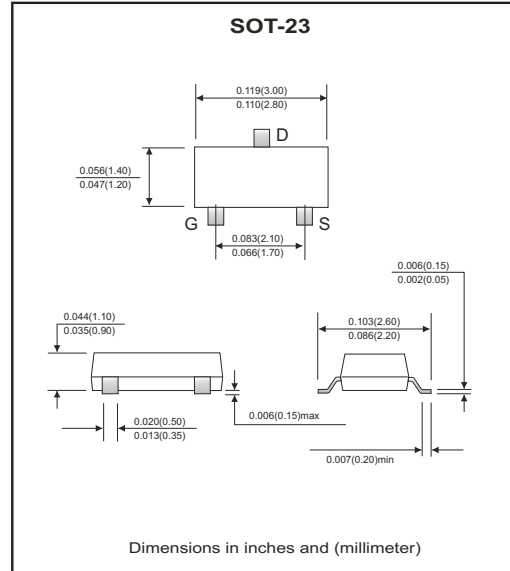
Equivalent Circuit



G : Gate
S : Source
D : Drain

Maximum Ratings (at TA=25°C)

Parameter	Symbol	Value	Unit
Drain-Source voltage	V _{DS}	60	V
Drain current	I _D	250	mA
Power dissipation	P _D	350	mW
Junction and storage temperature	T _J , T _{STG}	-55 ~ +150	°C



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

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Drain-Source breakdown voltage	V _{GS} =0V, I _D =10μA	V _{(BR)DSS}	60	70		V
Gate-Threshold voltage	V _{DS} =V _{GS} , I _D =250 μA	V _{th(GS)}	1	1.5	2.5	
Gate-body leakage	V _{DS} =0V, V _{GS} =15V	I _{GSS}			10	nA
Zero gate voltage drain current	V _{DS} =60V, V _{GS} =0V	I _{DSS}			1	μA
	V _{DS} =60V, V _{GS} =0V, T _J =125°C				500	
On-state drain current	V _{GS} =10V, V _{DS} =7.5V	I _{D(ON)}	800	1300		mA
	V _{GS} =4.5V, V _{DS} =10V		500	700		
Drain-Source on resistance	V _{GS} =10V, I _D =250mA	r _{DS(ON)}		1.5	3	Ω
	V _{GS} =4.5V, I _D =200mA			2.0	4	
Forward tran conductance	V _{DS} =15V, I _D =200mA	g _{fs}		300		mS
Diode forward voltage	I _S =200mA, V _{GS} =0V	V _{SD}		0.85	1.2	V
Total gate charge	V _{DS} =30V, V _{GS} =10V, I _D =250mA	Q _g		0.6	1.0	nC
Gate-Source charge		Q _{gs}		0.06		
Gate-Drain charge		Q _{gd}		0.06		
Input capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	C _{iss}		25		pF
Output capacitance		C _{oss}		6		
Reverse transfer capacitance		C _{rss}		1.2		
Turn-on time	V _{DD} =30V, R _L =200Ω I _D =100mA, V _{GEN} =10V R _G =10Ω	t _{d(ON)}		7.5	20	nS
		t _r		6		
Turn-off time		t _{d(off)}		7.5	20	

RATING AND CHARACTERISTIC CURVES (2N7002-HF)

Fig.1 On-Region Characteristics

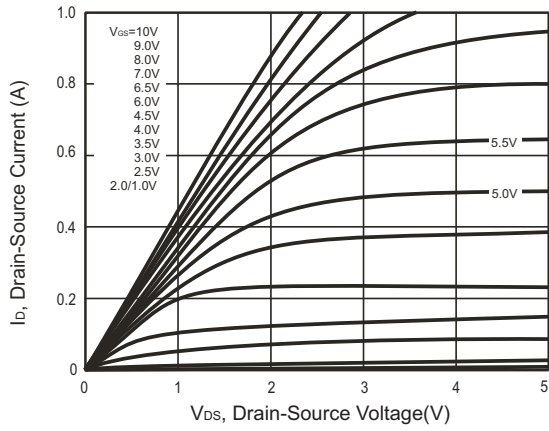


Fig.2 On-Resistance vs Drain Current

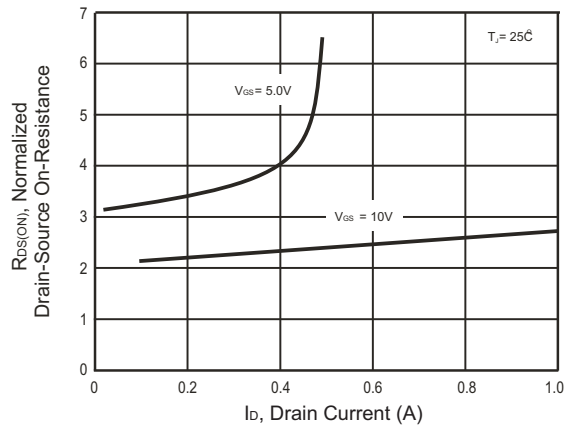


Fig.3 On-Resistance vs Junction Temperature

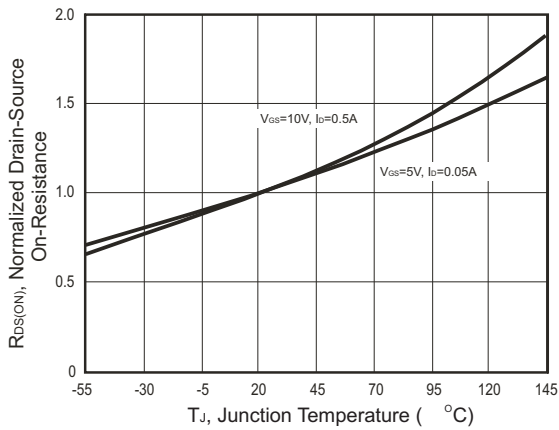
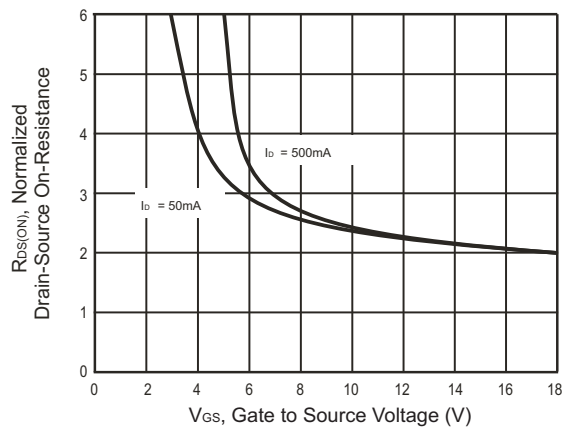
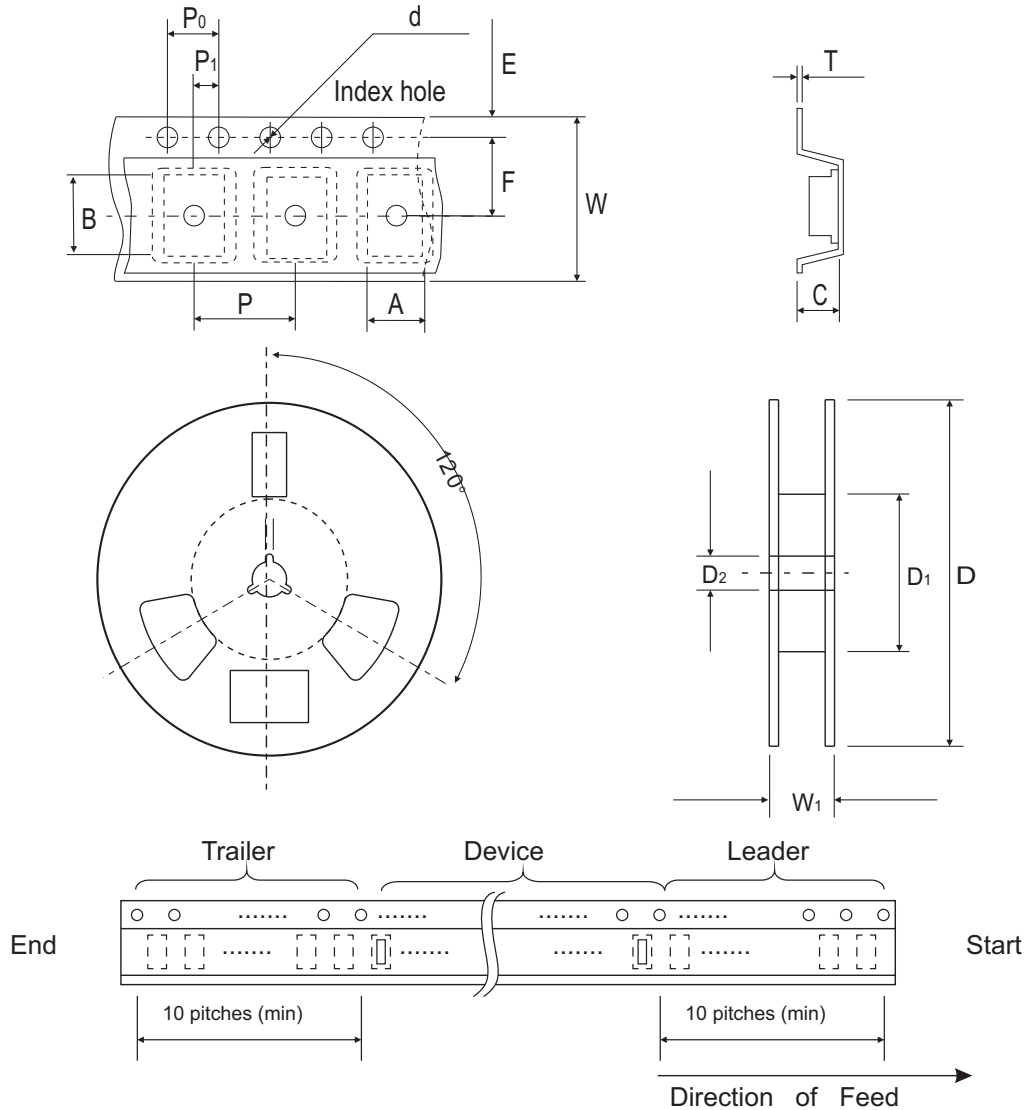


Fig.4 On-Resistance vs Gate-Source Voltage



Reel Taping Specification

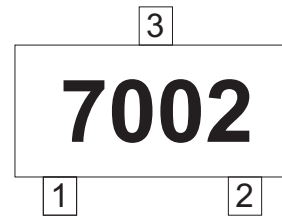


SOT-23	SYMBOL	A	B	C	d	D	D ₁	D ₂
	(mm)	3.10 ± 0.10	2.85 ± 0.10	1.40 ± 0.10	1.55 ± 0.10	178 ± 1	50.0 MIN.	13.0 ± 0.20
	(inch)	0.122 ± 0.004	0.112 ± 0.004	0.055 ± 0.004	0.061 ± 0.004	7.008 ± 0.04	1.969 MIN.	0.512 ± 0.008

SOT-23	SYMBOL	E	F	P	P ₀	P ₁	W	W ₁
	(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	8.00 ± 0.30	14.4 MAX.
	(inch)	0.069 ± 0.004	0.138 ± 0.002	0.157 ± 0.004	0.157 ± 0.004	0.079 ± 0.002	0.315 ± 0.012	0.567 MAX.

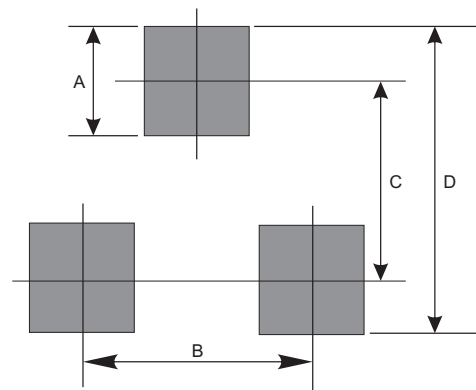
Marking Code

Part Number	Marking Code
2N7002-HF	7002



Suggested PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.80	0.031
B	1.90	0.075
C	2.02	0.080
D	2.82	0.111



Standard Package

Case Type	Qty per Reel	Reel Size
	(Pcs)	(inch)
SOT-23	3000	7