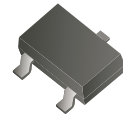


2N7002KA-HF

N-Channel
RoHS Device
Halogen Free



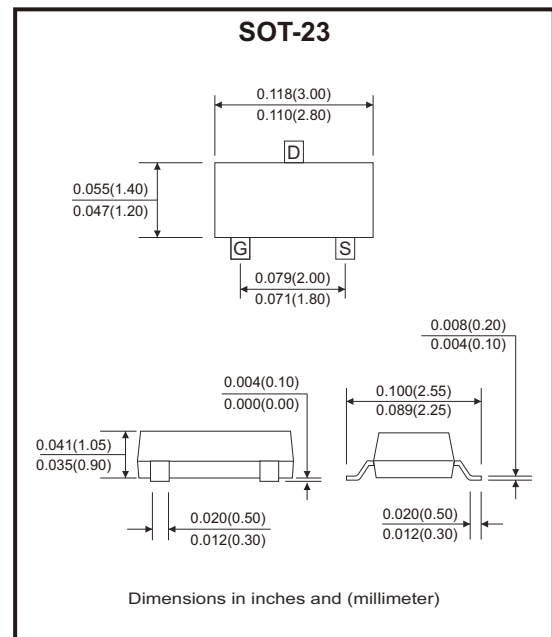
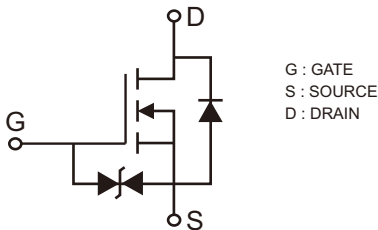
Features

- Trench power MV MOSFET technology.
- Voltage controlled small signal switch.
- Low input capacitance.
- Fast switching speed.
- Low input/output leakage.

Mechanical data

- Case: SOT-23, molded plastic.

Circuit Diagram



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

Parameter	Symbol	Value	Unit
Drain-source voltage	V _{DS}	60	V
Gate-source voltage	V _{GS}	±20	V
Drain current	I _D	T _A =25°C @ steady state	340
		T _A =70°C @ steady state	272
Pulsed drain current (Note 1)	I _{DM}	1.5	A
Total power dissipation @ T _A =25°C	P _D	350	mW
Thermal resistance junction to ambient @ steady state (Note 2)	R _{θJA}	357	°C/W
Junction and storage temperature range	T _J , T _{STG}	-55 to +150	°C

Notes: 1. Pulse width ≤ 300μs, duty cycle ≤ 2%.

2. Device mounted on FR-4 PCB, 1 inch x 0.85 inch x 0.062 inch.

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REV:A

Electrical Characteristics (at $T_J=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Parameters						
Drain-source breakdown voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = 60V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±9	μA
		V _{GS} = ±10V, V _{DS} = 0V			±200	nA
		V _{GS} = ±5V, V _{DS} = 0V			±100	
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.4	2.5	V
Static drain-source on-resistance	R _{DS(ON)}	V _{GS} = 10V, I _D = 300mA		1.3	2.5	Ω
		V _{GS} = 4.5V, I _D = 200mA		1.4	3.0	
Diode forward voltage	V _{SD}	I _S = 300mA, V _{GS} = 0V			1.2	V
Max. body-diode continuous current	I _S				340	mA
Dynamic Parameters						
Input capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz		18		pF
Output capacitance	C _{oss}			12		
Reverse transfer capacitance	C _{rss}			7		
Switching Parameters						
Total gate charge	Q _g	V _{GS} = 10V, V _{DS} = 30V, I _D = 0.3A		1.7	2.4	nC
Turn-on delay time	t _{d(on)}	V _{GS} = 10V, V _{DD} = 30V		5		ns
Turn-off delay time	t _{d(off)}	I _D = 300mA, R _{GEN} = 6Ω		17		
Reverse recovery time	t _{rr}	V _{GS} = 0V, I _S = 300mA, V _R = 25V dI _S /dI = -100A/μs		30		ns

Rating and Characteristic Curves (2N7002KA-HF)

Fig.1 - Output Characteristics

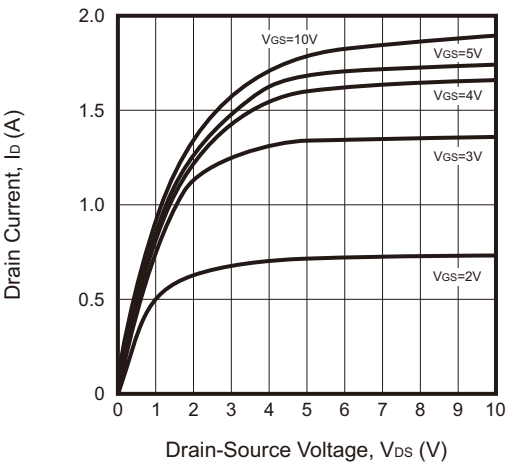


Fig.2 - Transfer Characteristics

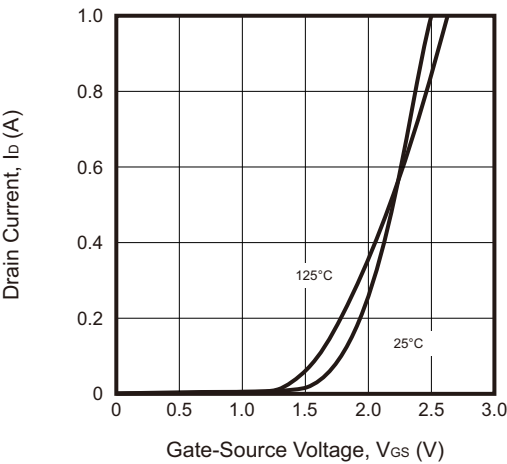


Fig.3 - Capacitance Characteristics

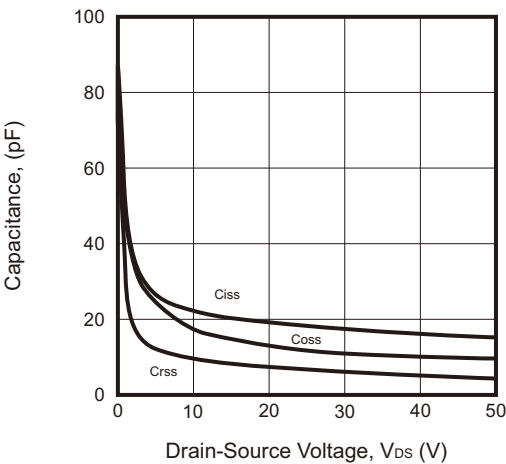


Fig.4 - Gate Charge

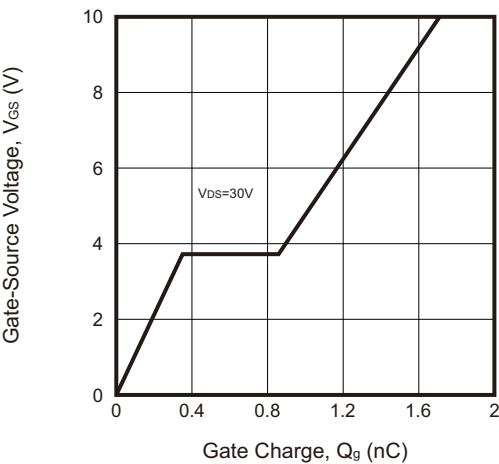


Fig.5 - Drain-Source on Resistance

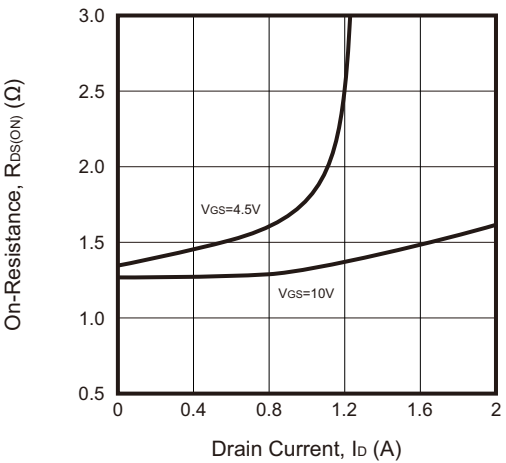
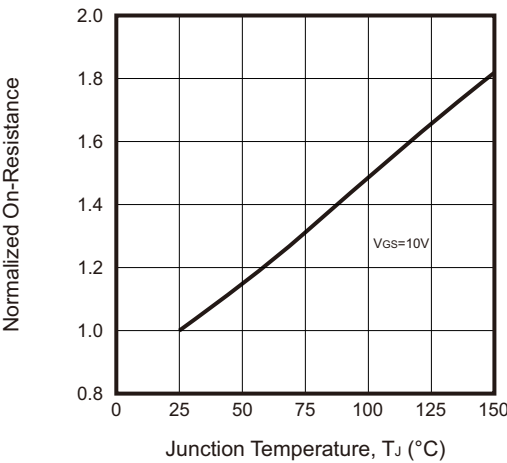
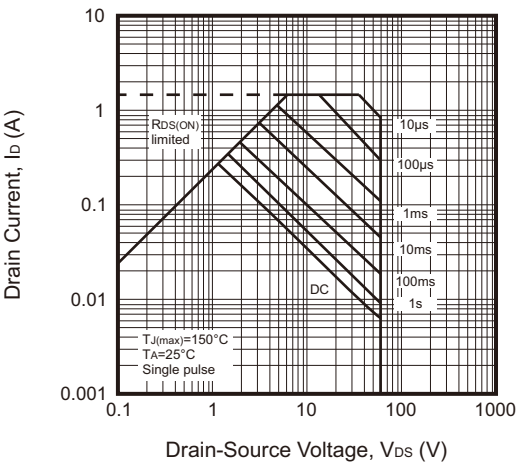


Fig.6 - Drain-Source on Resistance

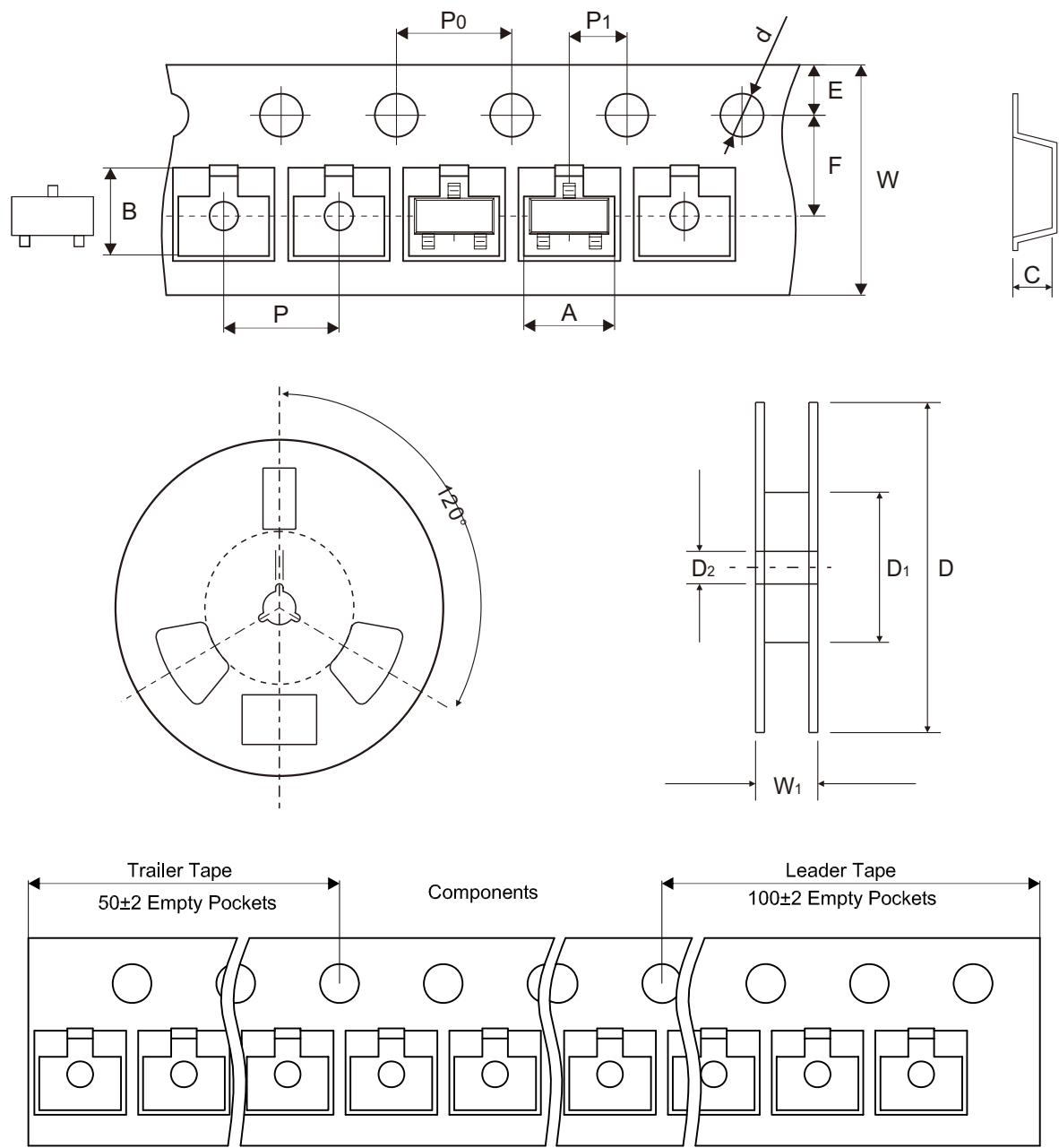


Rating and Characteristic Curves (2N7002KA-HF)

Fig.7 - Safe Operation Area



Reel Taping Specification



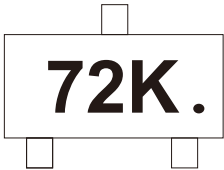
SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 + 0.10 - 0.00	178.00 ± 1.00	54.60 ± 1.00	13.30 ± 1.00
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 + 0.004 - 0.000	7.008 ± 0.039	2.150 ± 0.039	0.524 ± 0.039

SOT-23	SYMBOL	E	F	P	P0	P1	W	W1
	(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 - 0.10	11.10 ± 0.20
	(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 - 0.004	0.437 ± 0.008

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Marking Code

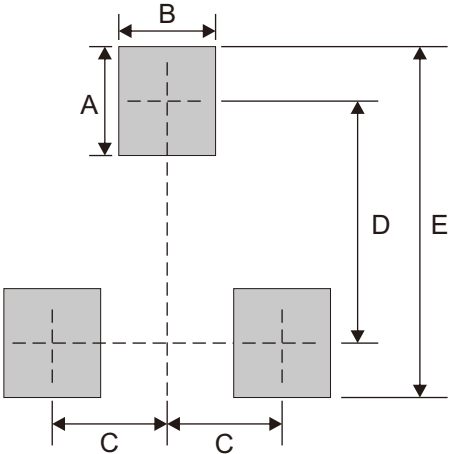
Part Number	Marking Code
2N7002KA-HF	72K.



Suggested P.C.B. PAD Layout

SIZE	SOT-23	
	(mm)	(inch)
A	0.90	0.035
B	0.80	0.031
C	0.95	0.037
D	2.00	0.079
E	2.90	0.114

Note: 1. The pad layout is for reference purposes only.



Standard Packaging

Case Type	REEL PACK	
	REEL (pcs)	Reel Size (inch)
SOT-23	3,000	7