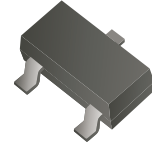


2N7002H-HF

RoHS Device
Halogen Free
N-Channel



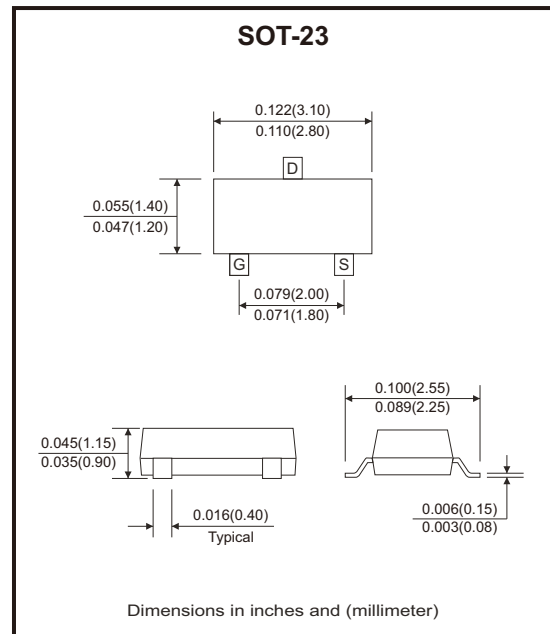
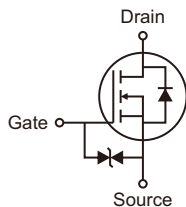
Features

- N-Channel enhancement mode field effect transistor, Designed for high speed pulse amplifier and drive application, which is manufactured by the N-Channel Dmos process.
- ESD MIL-STD 883C, ±2.5KV contact discharge compliant protection.

Mechanical data

- Case: SOT-23, molded plastic.
- Solderability: MIL-STD-202, Method 208.

Circuit Diagram



Maximum Rating (at $T_A=25^{\circ}\text{C}$ unless otherwise noted) (Note 2)

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	±20	V
Drain current (pulsed) (Note 3)	I_{DM}	800	mA
Drain current (continuous)	I_D	300	
Maximum power dissipation	P_D	350	mW
Operating junction temperature range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$
Thermal resistance, junction to ambient (Note 1)	$R_{\theta JA}$	357	$^{\circ}\text{C/W}$
Thermal resistance, junction to case (Note 1)	$R_{\theta JC}$	90	$^{\circ}\text{C/W}$

Notes: 1. $R_{\theta JA}$ is the sum of junction to case and case to ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta CA}$ is determined by the user's board design. The value of $R_{\theta JA}$ is measured with device mounted on 1 in² FR-4 board with 2 oz copper.

2. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

3. Pulse width limited by maximum junction temperature.

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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-source breakdown voltage	B _V DSS	V _{GS} =0V, I _D =10μA	60			V
Drain-source leakage current	I _{DSS}	V _{GS} =0V, V _{DS} =60V, T _J =25°C			1	μA
Gate-source leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±10	μA
On Characteristics (Note 1)						
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.7	2.5	V
Static drain-source on resistance	R _{DS(ON)}	V _{GS} =10V, I _D =300mA		2.0	3.0	Ω
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1MHz			50	pF
Output capacitance	C _{oss}				25	
Reverse transfer capacitance	C _{rss}				5	
Switching Characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =30V, I _D =200mA, R _L =150Ω, V _{GEN} =10V R _{GEN} =25Ω		6		nS
Turn-on rise time	t _r			5		
Turn-off delay time	t _{d(off)}			25		
Turn-off fall time	t _f			15		
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-source diode forward voltage	V _{SD}	V _{GS} =0V, I _S =300mA		0.85	1.5	V

Notes: 1. Pulse test : Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$

Rating and Characteristic Curves (2N7002H-HF)

Fig.1 - Output Characteristics

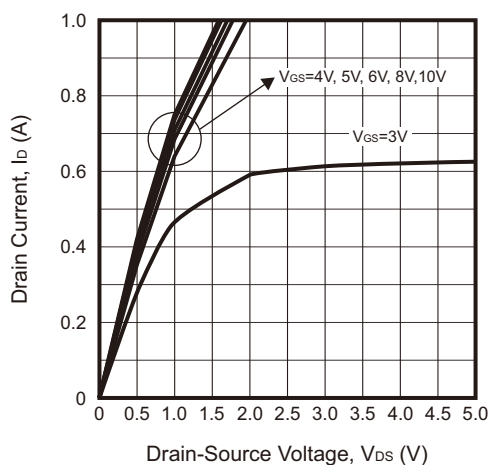
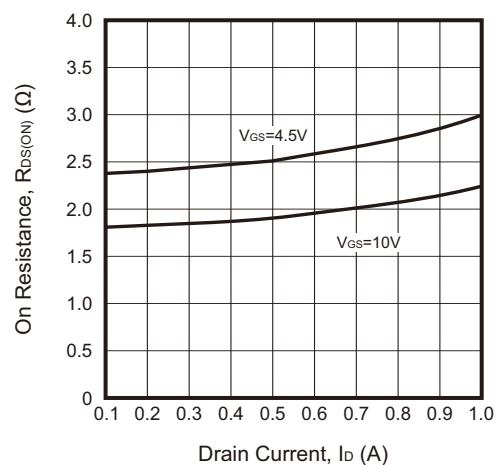


Fig.2 - Drain-Source On Resistance



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REV:A

Rating and Characteristic Curves (2N7002H-HF)

Fig.3 - Transfer Characteristics

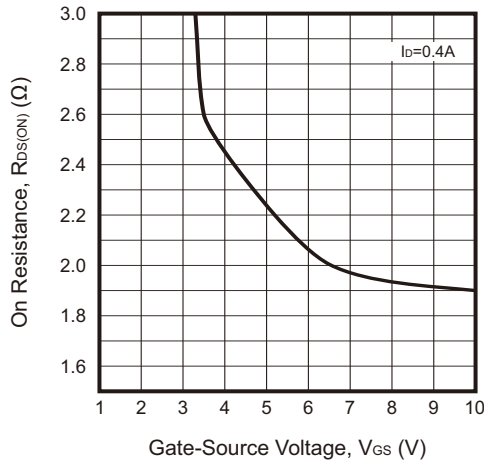


Fig.4 - Gate Threshold Voltage

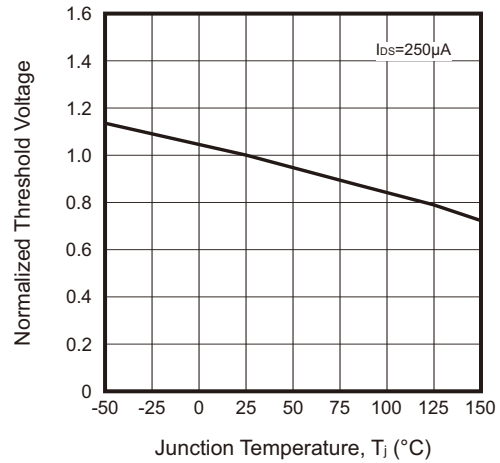


Fig.5 - Drain-Source On Resistance

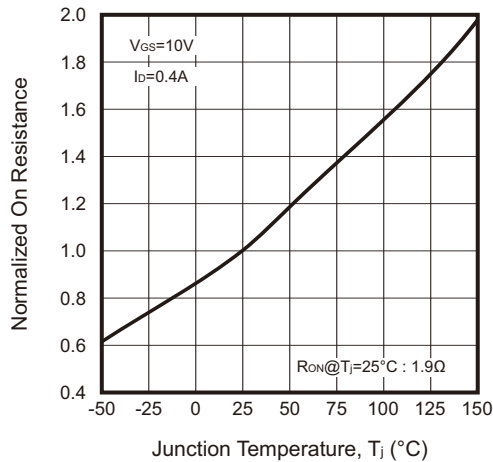


Fig.6 - Source-Drain Diode Forward

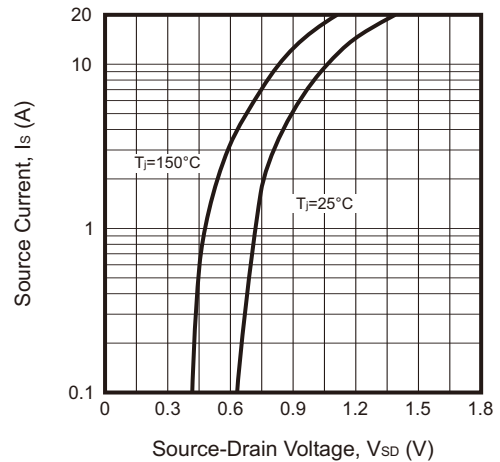


Fig.7 - Capacitance

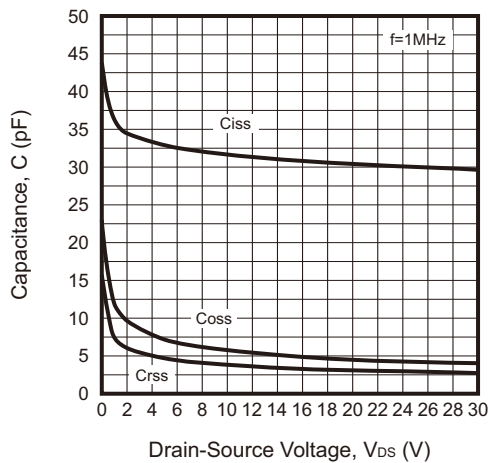
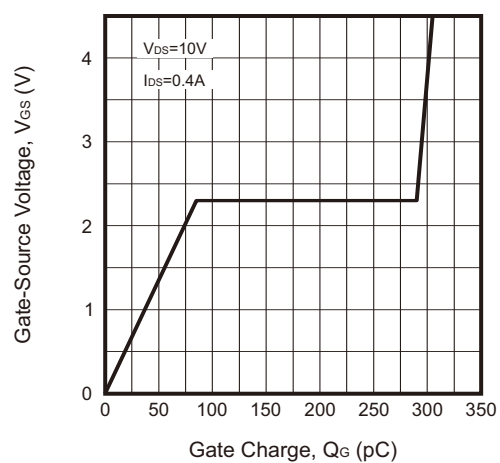
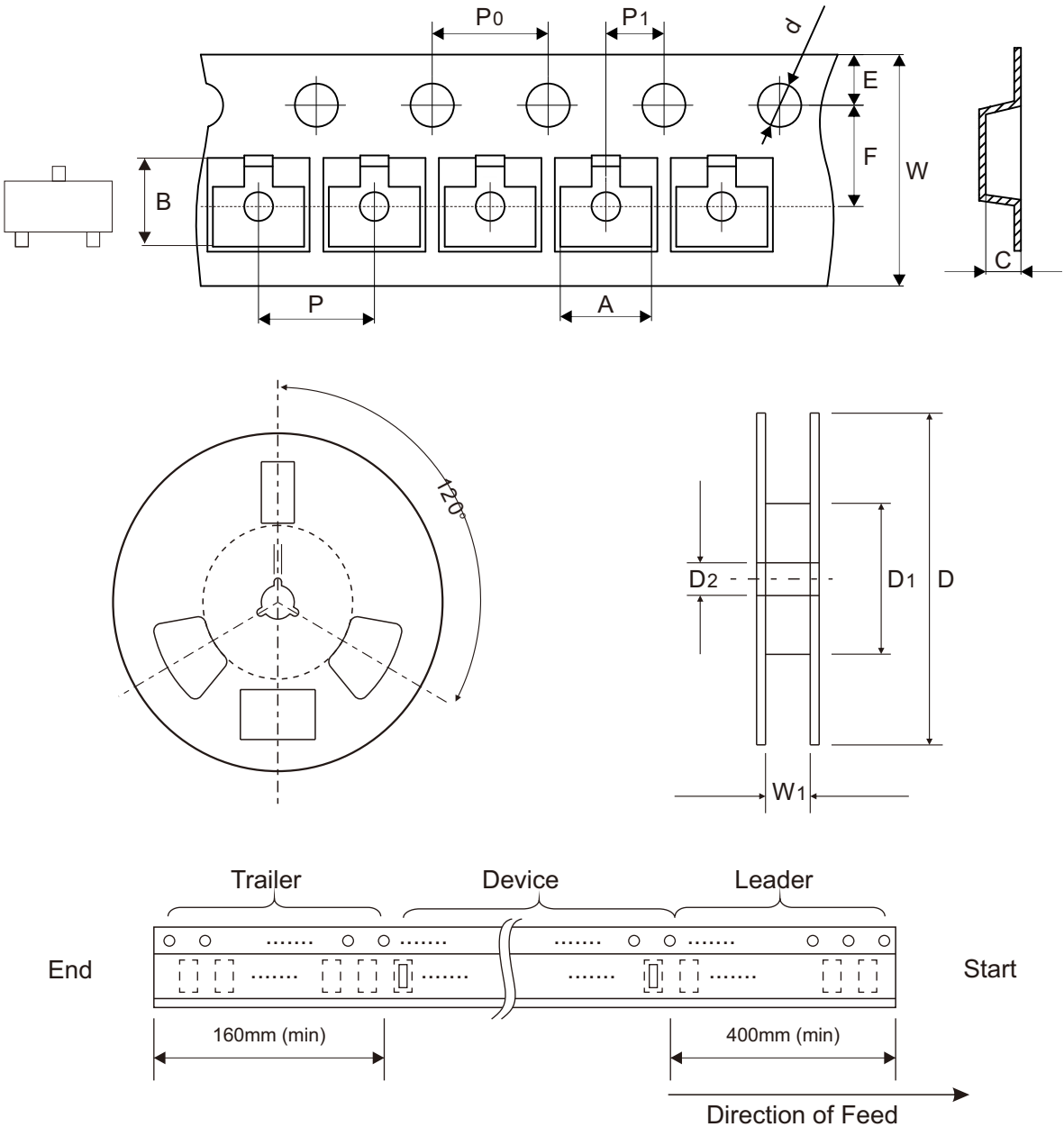


Fig.8 - Gate Charge



Reel Taping Specification



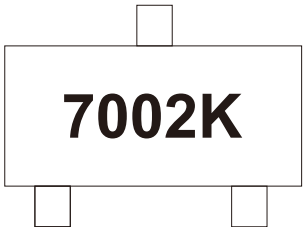
SOT-23	SYMBOL	A	B	C	d	D	D1	D2
	(mm)	3.15 ± 0.10	2.77 ± 0.10	1.22 ± 0.10	1.50 ± 0.10	178.00 ± 1.00	54.00 ± 0.50	13.00 ± 0.50
	(inch)	0.124 ± 0.004	0.109 ± 0.004	0.048 ± 0.004	0.059 ± 0.004	7.008 ± 0.039	2.126 ± 0.020	0.512 ± 0.020

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	9.50 ± 1.00
	(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	0.374 ± 0.039

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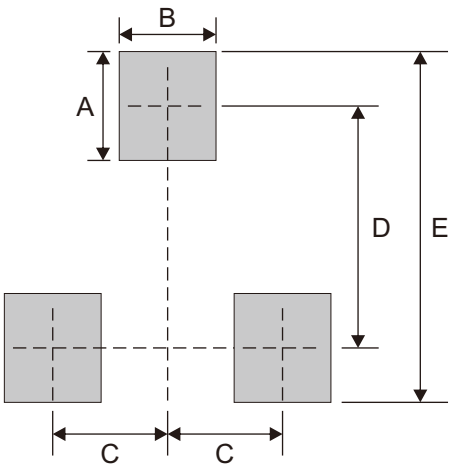
Marking Code

Part Number	Marking Code
2N7002H-HF	7002K



Suggested 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



Standard Packaging

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