

FMJN2N7002E-H

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300mA 60V N-Channel Enhancement Mode MOSFET ESD Protection

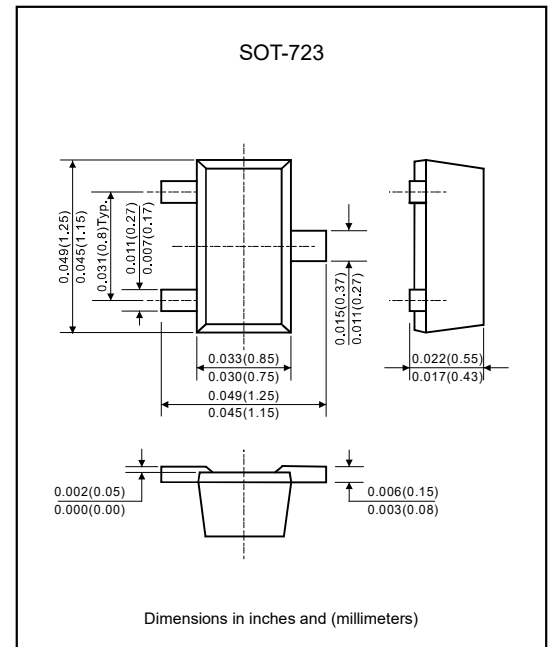
Features

- $V_{DS}=60V$, $I_D=300mA$.
- $R_{DS(ON)} < 3.0\Omega$, @ $V_{GS}=10V$, $I_D=500mA$.
- $R_{DS(ON)} < 4.0\Omega$, @ $V_{GS}=4.5V$, $I_D=200mA$.
- Low on-resistance and low gate threshold voltage.
- Low input capacitance.
- ESD protected up to 2kV.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-723.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Mounting Position : Any.

Package outline



Maximum ratings (At $T_A=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	60	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current	I_D	300	mA
Pulsed drain current (Pulse width $\leq 10\mu s$)	I_{DM}	800	mA
Total power dissipation	P_D	150	mW
Junction temperature	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

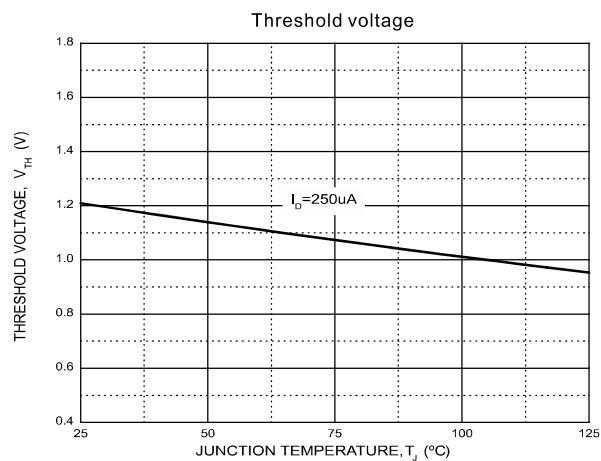
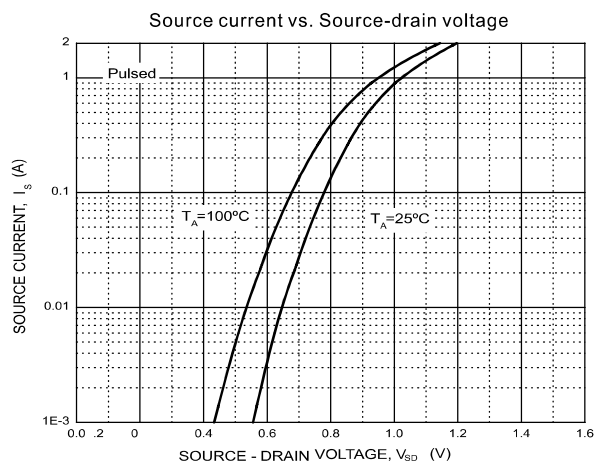
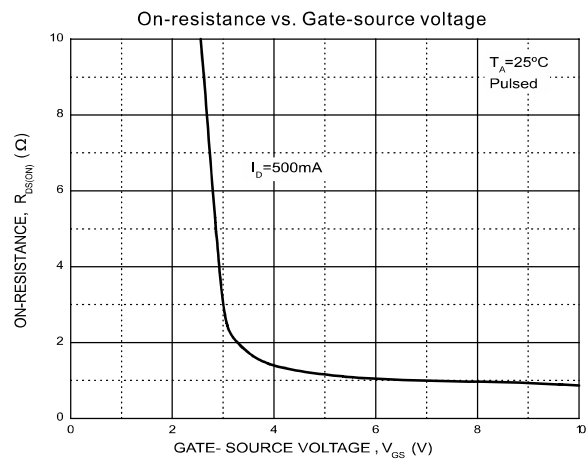
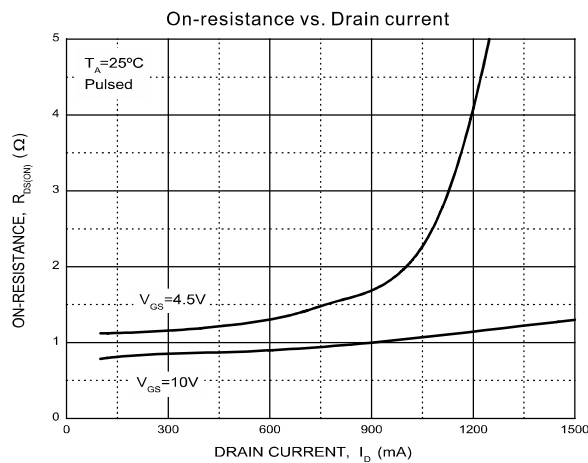
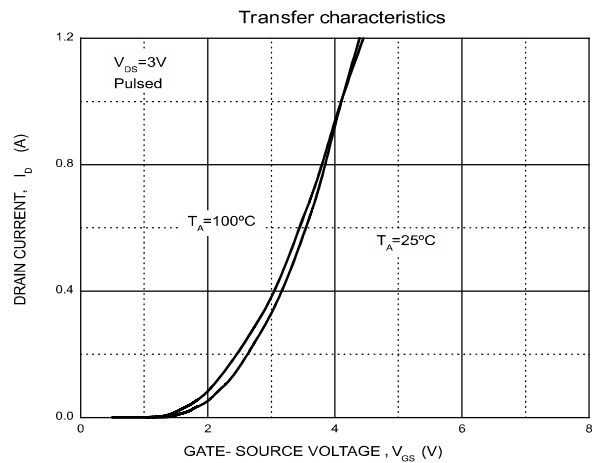
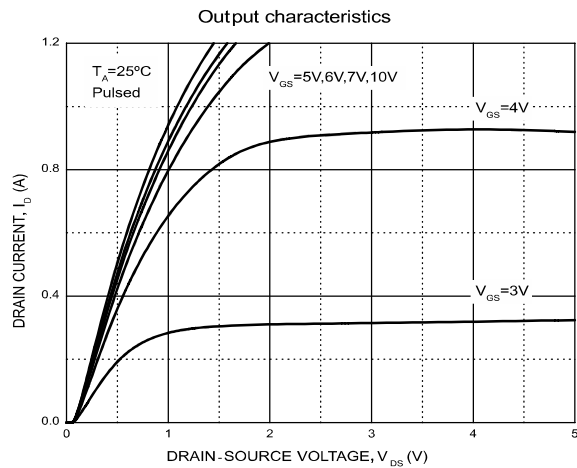
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Electrical characteristics (At $T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV_{DSS}	$I_D=10\mu A, V_{GS}=0V$	60			V
Drain-source leakage current	I_{DSS}	$V_{DS}=60V, V_{GS}=0V$			1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$			± 10	μA
On characteristics						
Gate threshold voltage	$V_{GS(TH)}$	$V_{DS}=10V, I_D=250\mu A$	1.0		2.5	V
Static drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=10V, I_D=500mA$			3	Ω
		$V_{GS}=4.5V, I_D=200mA$			4	
Forward trans conductance	g_{FS}	$V_{DS}=10V, I_D=200mA$	80			mS
Dynamic parameters						
Input capacitance	C_{iss}	$V_{DS}=25V, f=1.0MHz$			50	pF
Out capacitance	C_{oss}				25	
Reverse transfer capacitance	C_{rss}				5	
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage	V_{SD}	$I_S=115mA, V_{GS}=0V$		0.55	1.2	V

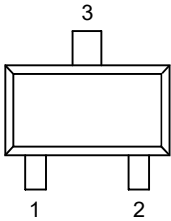
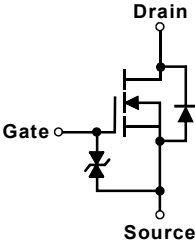
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Rating and characteristic curves



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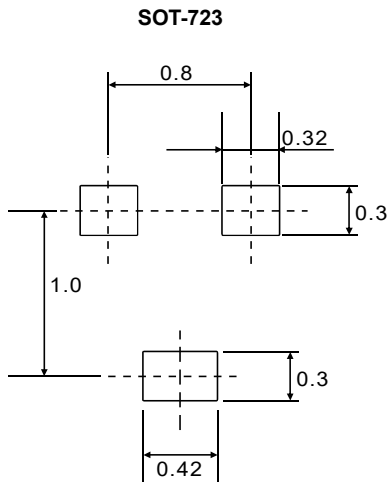
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type number	Marking code
FMJN2N7002E-H	72K

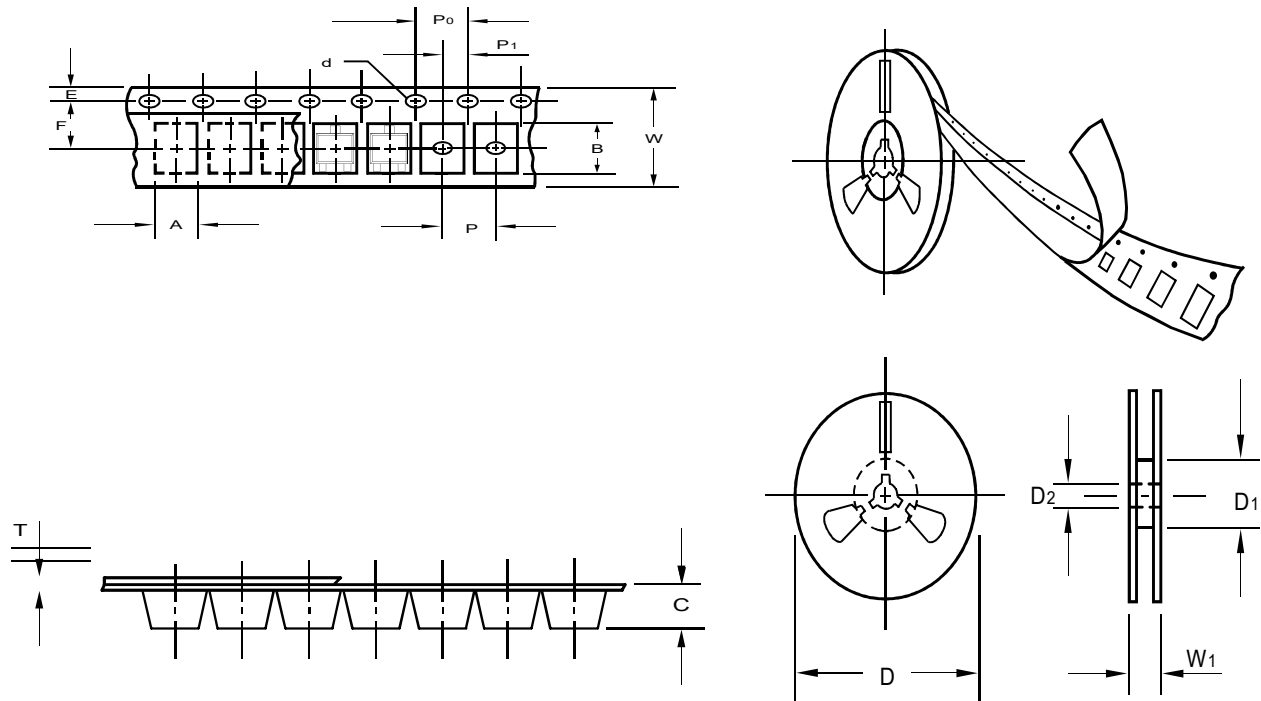
Suggested solder pad layout



DIMENSIONS: MILLIMETERS

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-723
Carrier width	A	0.1	1.33
Carrier length	B	0.1	1.45
Carrier depth	C	0.1	0.61
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	54.40
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	2.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W1	1.0	9.50

Note: Devices are packed in accordance with EIA standard RS-481-A and specifications listed above.

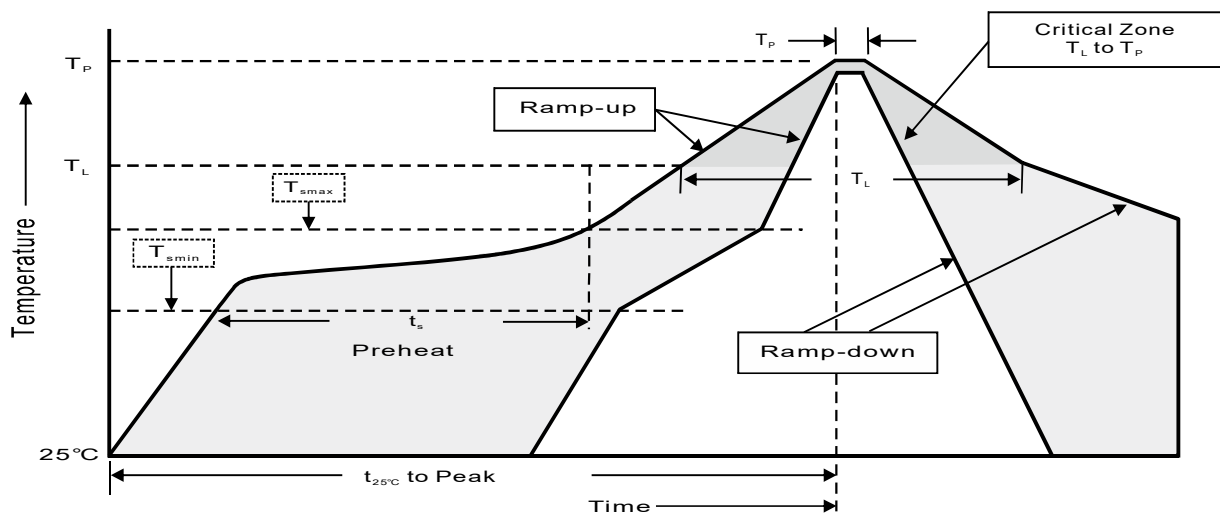
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Reel packing

PACKAGE	REEL SIZE	REEL (pcs)	COMPONENT SPACING (m/m)	BOX (pcs)	INNER BOX (m/m)	REEL DIA, (m/m)	CARTON SIZE (m/m)	CARTON (pcs)
SOT-723	7"	8,000	2.0	80,000	183*183*123	178	382*262*387	640,000

Suggested thermal profiles for soldering processes

- 1.Storage environment: Temperature = 5°C ~ 40°C Humidity = 55%, ±25%
- 2.Reflow soldering of surface-mount devices



3.Reflow soldering

Profile feature	Soldering condition
Average ramp-up rate (T_L to T_p)	< 3 °C/sec
Preheat - Temperature Min (T_{smin}) - Temperature Max (T_{smax}) - Time (Min to Max) (t_s)	150°C 200°C 60 ~ 120 sec
T_{smax} to T_L - Ramp-up rate	< 3 °C/sec
Time maintained above : - Temperature (T_L) - Time (T_L)	217°C 60 ~ 260 sec
Peak temperature (T_p)	255 °C -0/+5°C
Time with 5°C of actual peak temperature (T_p)	10 ~30 sec
Ramp-down rate	< 6 °C/sec
Time 25°C to peak temperature	< 6 minutes