

FMVN3134E-H

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FMVN3134E-H

0.65A 20V N-Channel General Small Signal MOSFET ESD Protection

Features

- $V_{DS}=20V$, $I_D=0.87A$.
- $R_{DS(ON)} \leq 330m\Omega$, @ $V_{GS}=4.5V$, $I_D=0.65A$.
- $R_{DS(ON)} \leq 400m\Omega$, @ $V_{GS}=2.5V$, $I_D=0.55A$.
- $R_{DS(ON)} \leq 750m\Omega$, @ $V_{GS}=1.8V$, $I_D=0.45A$.
- ESD protected up to 2.0KV (HBM).
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

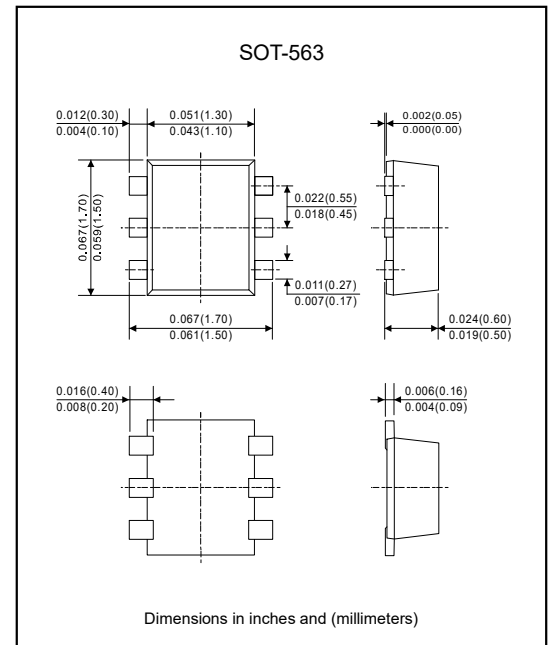
Applications

- Load Switch for Portable Devices.
- Voltage controlled small signal switch.
- DC-DC converters.

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-563.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Weight : Approximated 3.2mg.

Package outline



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

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	20	V
Gate-source voltage	V_{GS}	± 12	V
Continuous drain current	I_D	0.65	A
Pulsed drain current (Note1)	I_{DM}	2.64	A
Total power dissipation	P_D	0.15	W
Thermal resistance, junction to ambient (Note2)	$R_{\theta JA}$	833	$^\circ C/W$
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}	$I_D=250\mu\text{A}$, $V_{GS}=0\text{V}$	20			V
Drain-source leakage current	I_{DSS}	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$			1	μA
Gate-source leakage current	I_{GSS}	$V_{GS}=\pm 10\text{V}$, $V_{DS}=0\text{V}$			± 10	μA

On characteristics

Gate threshold voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	0.35		1.1	V
Static drain-source on-resistance	$R_{DS(ON)}$	$V_{GS}=4.5\text{V}$, $I_D=0.65\text{A}$		170	330	m Ω
		$V_{GS}=2.5\text{V}$, $I_D=0.55\text{A}$		230	400	
		$V_{GS}=1.8\text{V}$, $I_D=0.45\text{A}$		350	750	
Forward transconductance	g_{FS}	$V_{DS}=10\text{V}$, $I_D=800\text{mA}$		1.6		S

Dynamic parameters

Input capacitance	C_{iss}	$V_{DS}=16\text{V}$, $V_{GS}=0\text{V}$, $f=1.0\text{MHz}$		79		pF
Out capacitance	C_{oss}			13		
Reverse transfer capacitance	C_{rss}			9		
Total gate charge	Q_g	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $I_D=0.9\text{A}$		1		nC
Gate-source charge	Q_{gs}			0.28		
Gate-drain charge	Q_{gd}			0.22		

Switching parameters

Turn-on delay time	$t_{d(on)}$	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $R_G=10\Omega$, $I_D=0.5\text{A}$		6.7		ns
Rise time	t_r			4.8		
Turn-off delay time	$t_{d(off)}$			17.3		
Fall time	t_f			7.4		

Source-drain diode ratings and characteristics

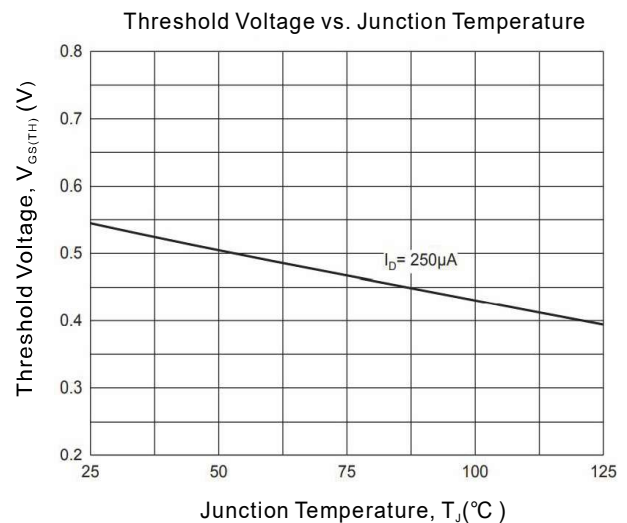
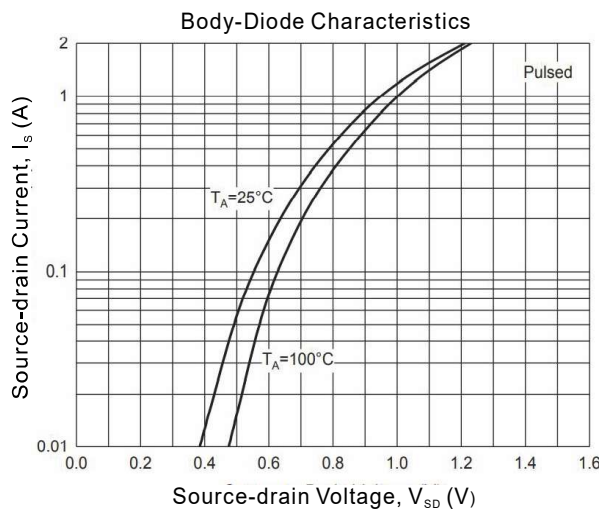
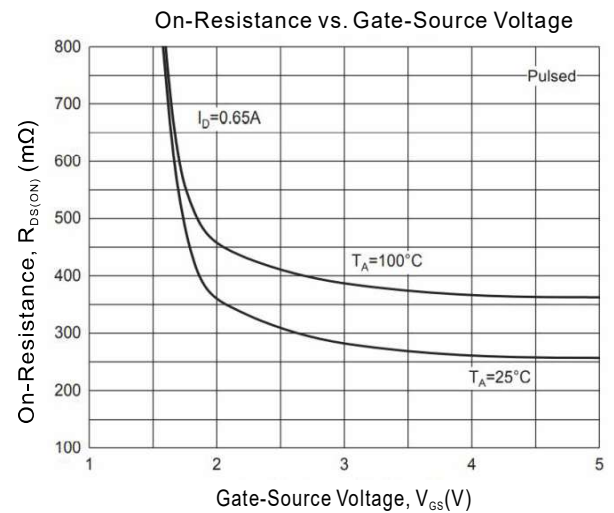
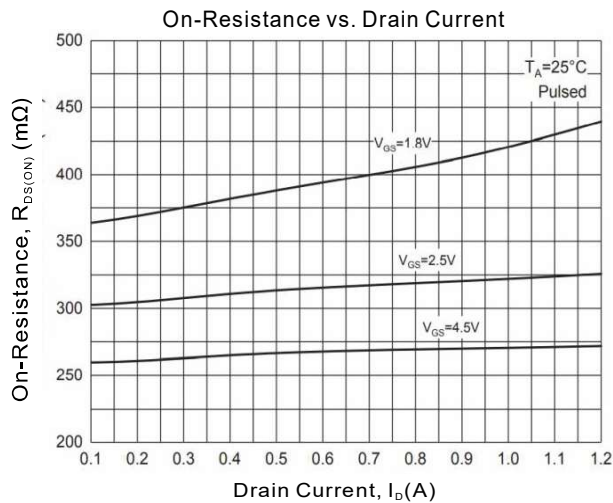
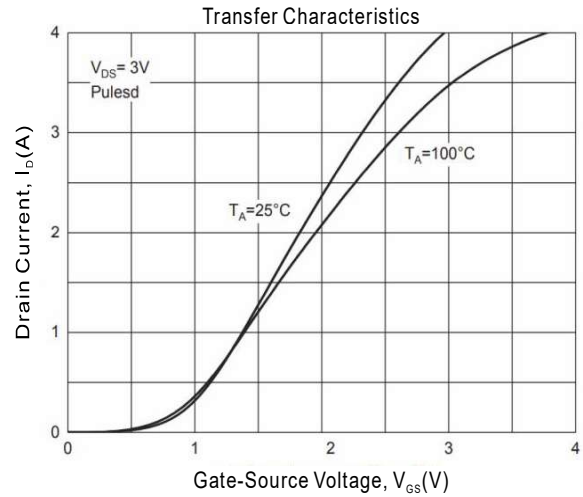
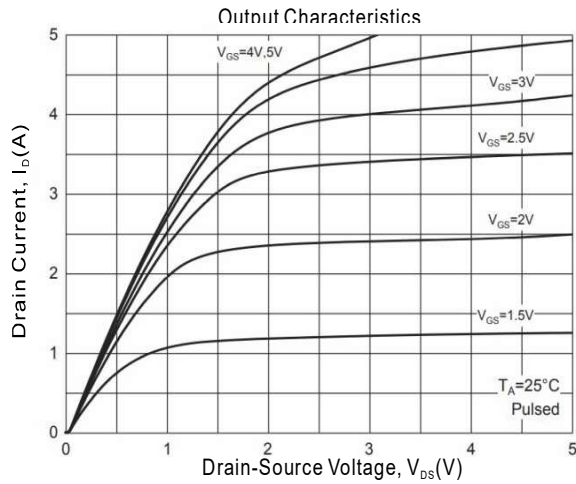
Source-drain forward voltage drop	V_{SD}	$I_S=1.0\text{A}$, $V_{GS}=0\text{V}$			1.2	V
Body diode Reverse recovery time	t_{rr}	$I_F=3.6\text{A}$, $dI_F/dt=100\text{A}/\mu\text{s}$		7.5		ns
Body diode Reverse recovery charge	Q_{rr}			2.5		nC

Note: 1. Pulse width $\leq 100\mu\text{s}$, duty cycle $\leq 1\%$, limited by T_{jmax} .

2. Device mounted on FR-4 substrate PC board, 2ozcopper, with 1-inch square copper plate in still air.

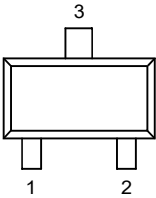
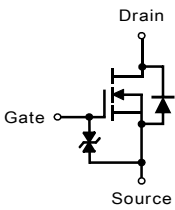
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Rating and characteristic curves



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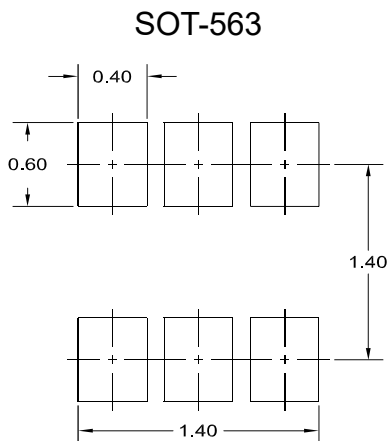
Pinning information

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

Marking

Type number	Marking code
FMVN3134E-H	.34K

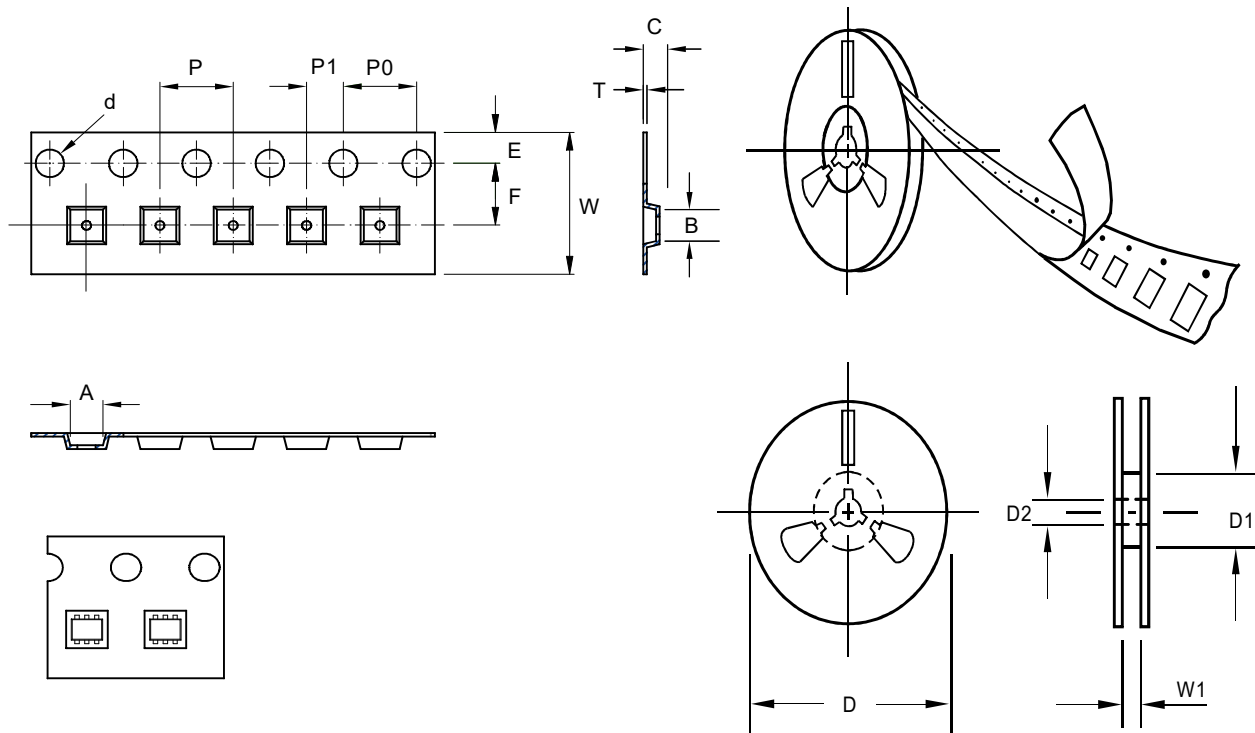
Suggested solder pad layout



Dimensions in millimeters

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Packing information



Unit : mm

Item	Symbol	Tolerance	SOT-563
Carrier width	A	± 0.1	1.78
Carrier length	B	± 0.1	1.78
Carrier depth	C	± 0.1	0.69
Sprocket hole	d	± 0.1	1.50
7" Reel outside diameter	D	± 1.0	178.00
7" Reel inner diameter	D1	± 0.5	54.40
Feed hole diameter	D2	± 0.3	13.00
Sprocket hole position	E	± 0.1	1.75
Punch hole position	F	± 0.1	3.50
Punch hole pitch	P	± 0.1	4.00
Sprocket hole pitch	P0	± 0.1	4.00
Embossment center	P1	± 0.1	2.00
Over all tape thickness	T	± 0.1	0.23
Tape width	W	± 0.2	8.00
Reel width	W1	± 0.2	9.50

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

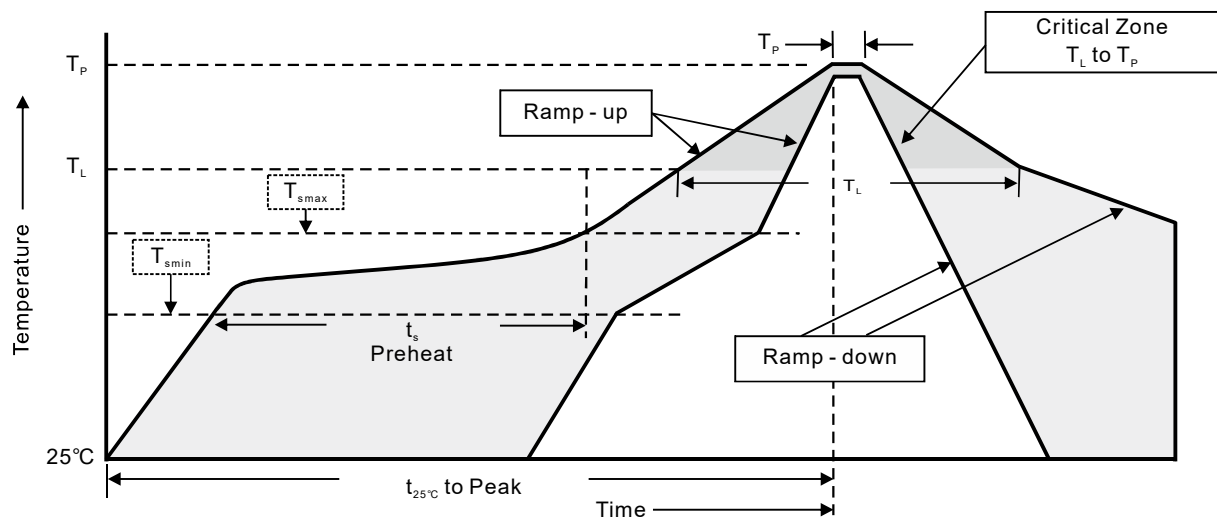
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Reel packing

Package	Units (pcs)			Dimension (Unit : mm)		
	Reel	Inner Box	Outer Box	Reel DIA,	Inner Box	Outer Box
SOT-563	3,000	45,000	180,000	178	203 x 203 x 195	438 x 438 x 220

Suggested thermal profiles for soldering processes

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



3. Reflow soldering

Profile feature	Soldering condition
Average ramp-up rate (T_L to T_p)	$< 3^\circ\text{C/sec}$
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	$< 3^\circ\text{C} / \text{sec}$
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	$< 6^\circ\text{C} / \text{sec}$
Time 25°C to peak temperature	< 6 minutes