

FMOS3134KT

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FMOS3134KT

0.75A, 20V N-Channel MOSFET

Features

- $V_{DS}=20V$, $I_D=0.75A$.
- $R_{DS(on)} < 190m\Omega @ V_{GS}=4.5V$, $I_D=0.5A$.
- $R_{DS(on)} < 315m\Omega @ V_{GS}=2.5V$, $I_D=0.4A$.
- Advanced trench technology.
- Excellent $R_{DS(on)}$ and low gate charge.
- ESD Protected : 2KV.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOS3134KT-H.

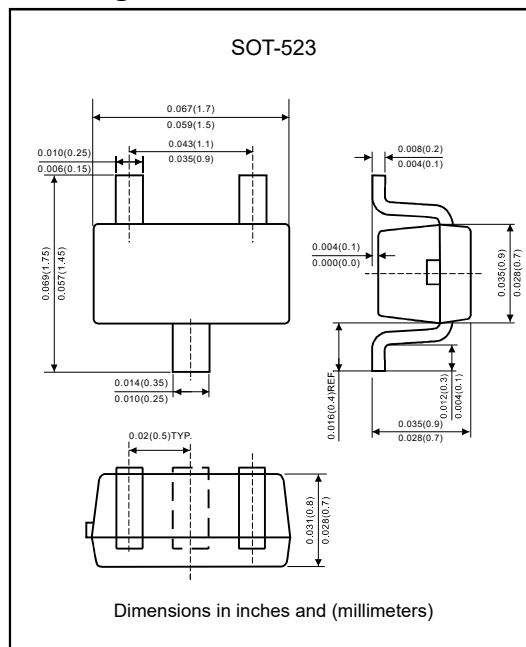
Application

- Load switch.
- PWM application.
- Power management.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-523.
- 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}	20	V
Gate-source voltage	V_{GS}	± 10	V
Continuous drain Current ($T_A=25^{\circ}C$)	I_D	0.75	A
Continuous drain Current ($T_A=100^{\circ}C$)		0.5	
Pulse drain current (Note 1)	I_{DM}	3	A
Power dissipation	P_D	0.17	W
Operating Junction temperature range	T_J	-55 to +150	$^{\circ}C$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}C$
Thermal resistance Junction to ambient	$R_{\theta JA}$	735	$^{\circ}C/W$

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

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}	$V_{DS}=0\text{V}$, $V_{GS}=\pm 10\text{V}$			± 10	μA

On characteristics

Gate threshold voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	0.4	0.7	1.0	V
Static drain-source on-resistance (Note 2)	$R_{DS(ON)}$	$V_{GS}=4.5\text{V}$, $I_D=0.5\text{A}$		145	190	$\text{m}\Omega$
		$V_{GS}=2.5\text{V}$, $I_D=0.4\text{A}$		225	315	

Dynamic Parameters

Input capacitance	C_{iss}	$V_{GS}=0\text{V}$, $V_{DS}=10\text{V}$, $f=1.0\text{MHz}$		60		pF
Output capacitance	C_{oss}			22		
Reverse transfer capacitance	C_{rss}			12		
Total gate charge	Q_g	$V_{GS}=4.5\text{V}$, $V_{DS}=10\text{V}$, $I_D=0.75\text{A}$		1		nC
Gate-source charge	Q_{gs}			0.28		
Gate-drain charge	Q_{gd}			0.22		

Switching parameters

Turn-on delay time	$t_{d(on)}$	$V_{DS}=10\text{V}$, $V_{GS}=4.5\text{V}$, $R_g=10\Omega$, $I_D=0.5\text{A}$		2		ns
Rise time	t_r			19		
Turn-off delay time	$t_{d(off)}$			10		
Fall time	t_f			23		

Source-drain diode ratings and characteristics

Maximum body - Diode continuous current	I_S				0.75	A
Maximum pulse drain to source diode forward current	I_{SM}				3	A
Drain - source diode forward voltage	V_{SD}	$V_{GS}=0\text{V}$, $I_S=0.75\text{A}$			1.2	V

Note : 1.Repetitive rating : Pulse width limited by maximum junction temperature.

2.Pulse Test : pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.

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Typical performance characteristics curves

Figure 1: Output Characteristics

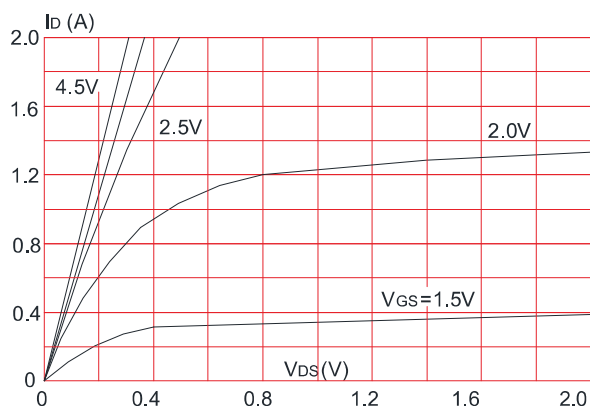


Figure 2: Typical Transfer Characteristics

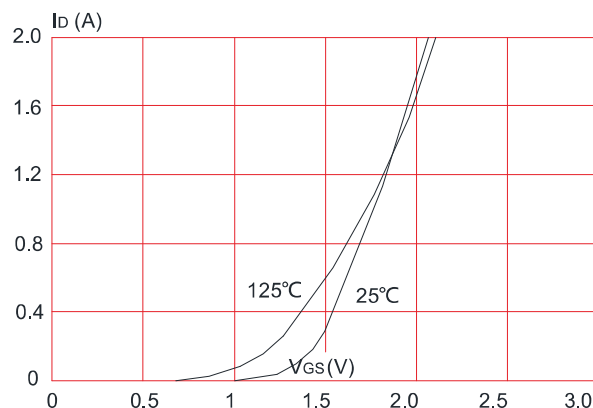


Figure 3: On-resistance vs. Drain Current

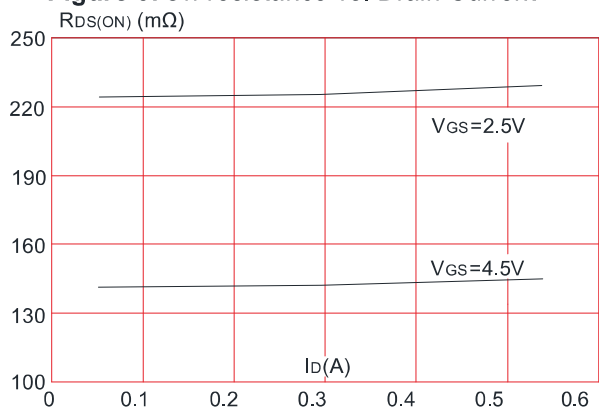


Figure 4: Body Diode Characteristics

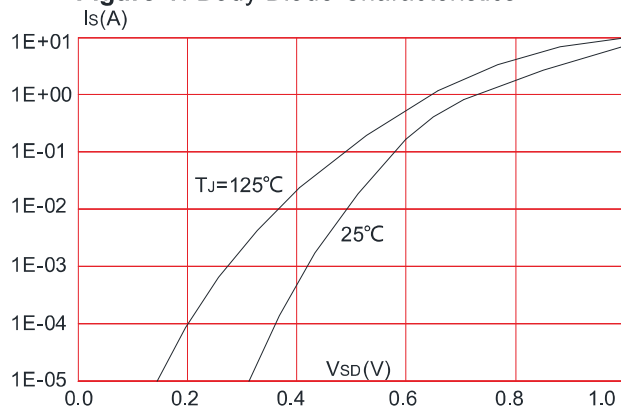


Figure 5: Gate Charge Characteristics

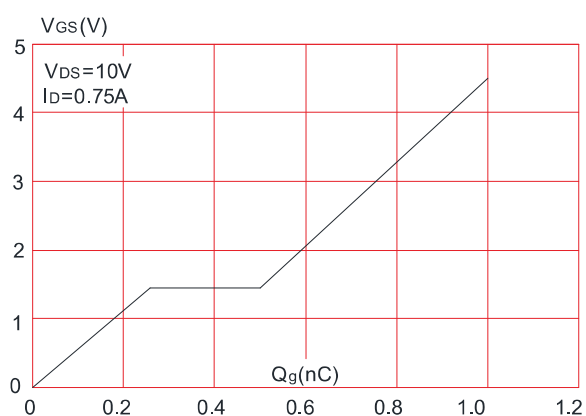
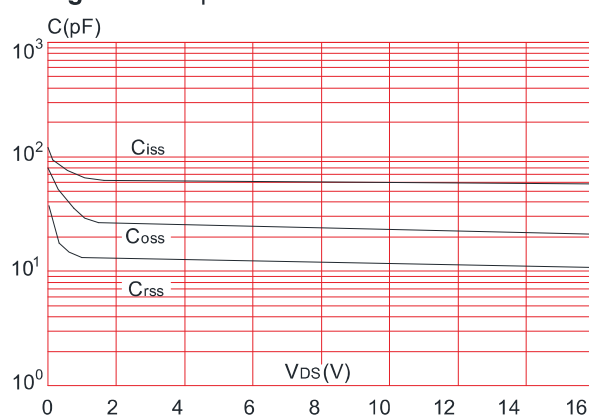
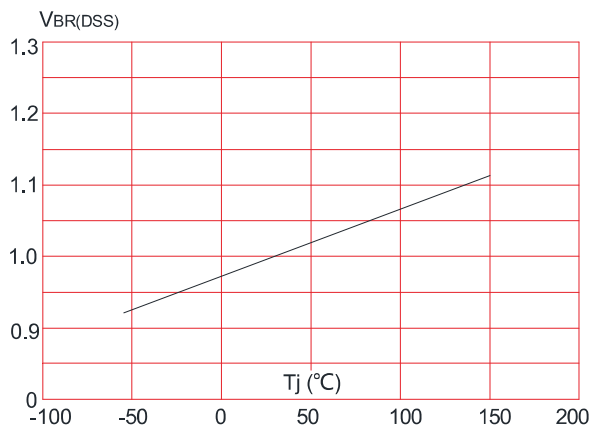
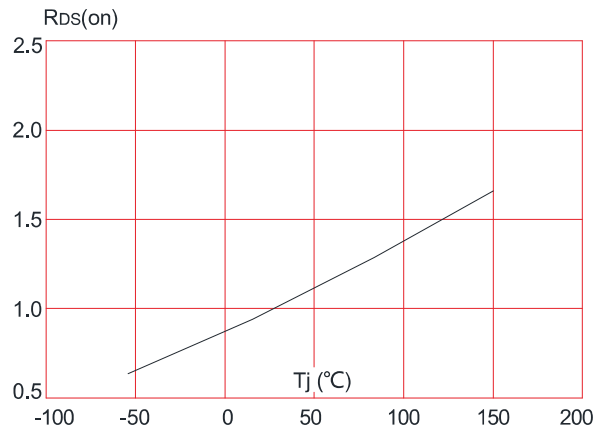
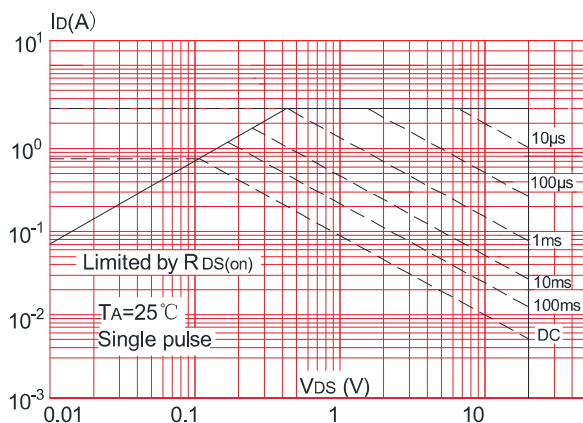
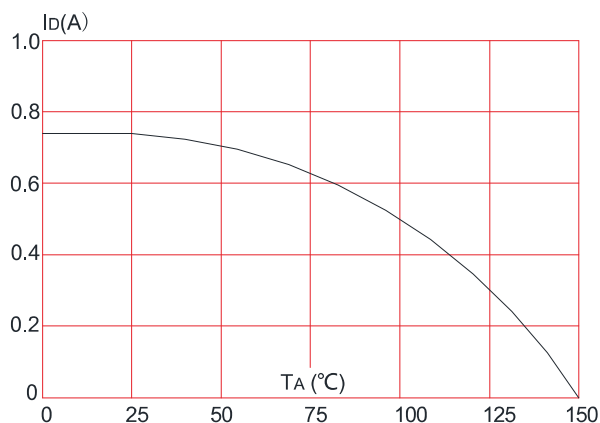
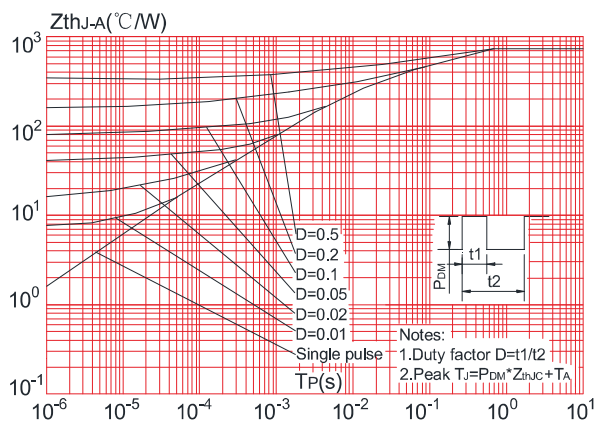


Figure 6: Capacitance Characteristics



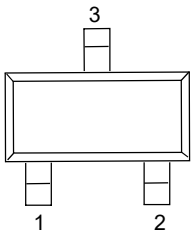
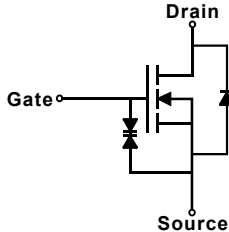
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Typical performance characteristics curves

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature**Figure 8:** Normalized on Resistance vs. Junction Temperature**Figure 9:** Maximum Safe Operating Area**Figure 10:** Maximum Continuous Drain Current vs. Ambient Temperature**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

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Pinning information

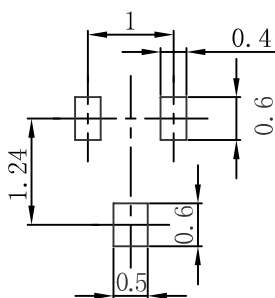
Pin	Simplified outline	Symbol
Pin 1 Gate Pin 2 Source Pin 3 Drain		

Marking

Type number	Marking code
FMOS3134KT	34K

Suggested solder pad layout

SOT-523

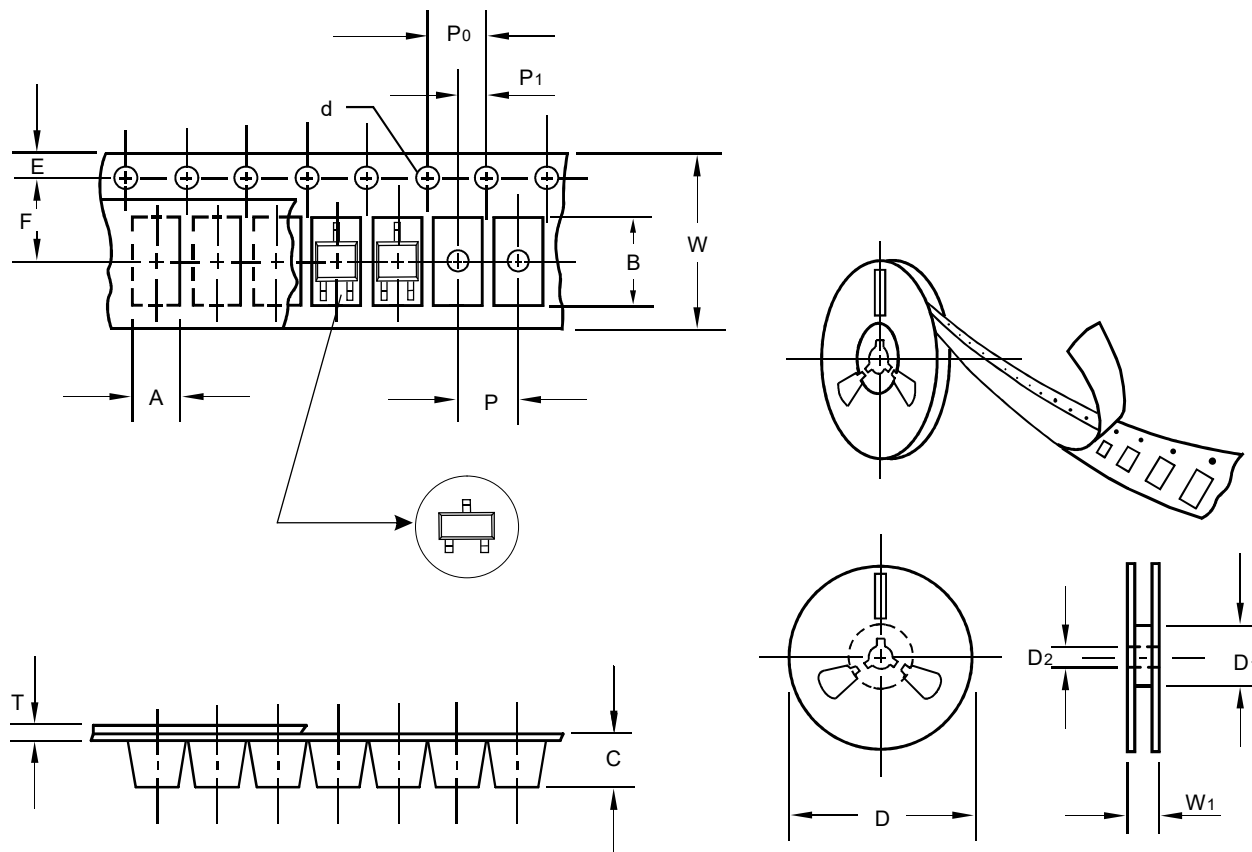


Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-523
Carrier width	A	0.1	1.85
Carrier length	B	0.1	1.85
Carrier depth	C	0.1	0.875
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	4.00
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	12.30

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

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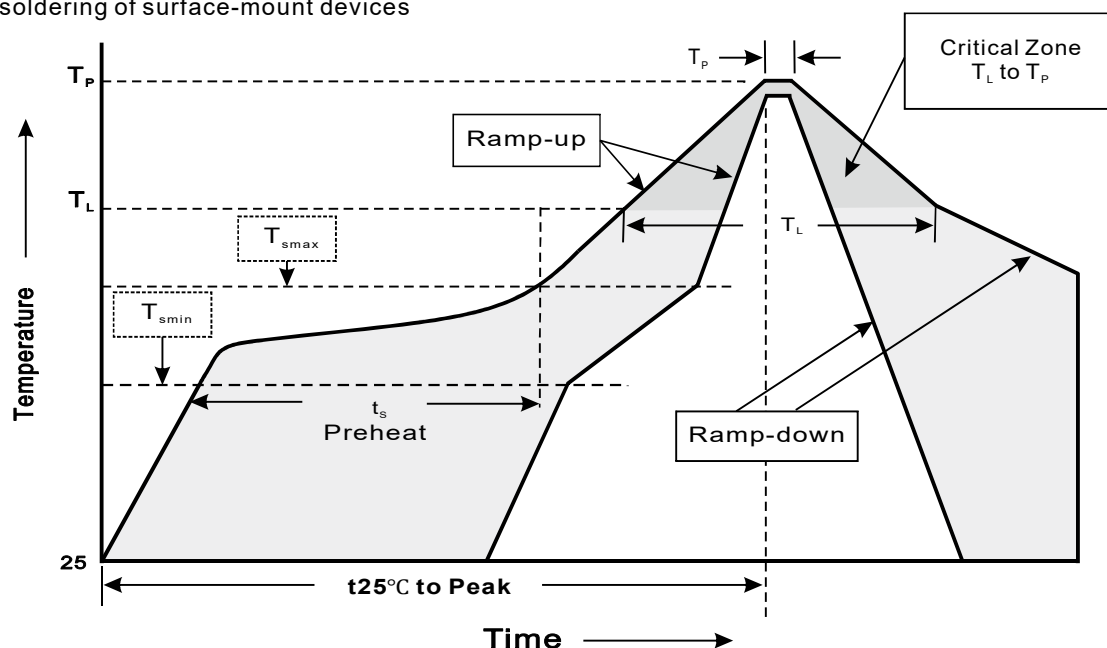
Reel packing

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)	APPROX. GROSS WEIGHT (kg)
SOT-523	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

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 ~ 120sec
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 within 5°C of actual peak Temperature(T_p)	10 ~ 30sec
Ramp-down rate	< 6°C/sec
Time 25°C to peak temperature	< 6 minutes