

# FMOSK3404-Q1

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# FMOSK3404-Q1

## 5.8A 30V N-Channel Enhancement Mode MOSFET

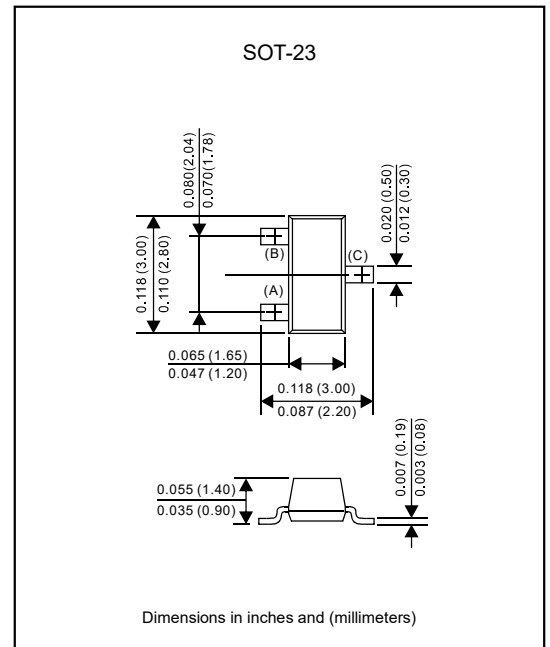
### Features

- $V_{DS}=30V, I_D=5.8A$ .
- $R_{DS(ON)} \leq 25m\Omega @V_{GS}=10V, I_D=5.8A$ .
- $R_{DS(ON)} \leq 35m\Omega @V_{GS}=4.5V, I_D=5A$ .
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSK3404-Q1H.

### Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

### Package outline



### Maximum ratings (AT $T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Rated	Unit
Drain-source voltage	$V_{DS}$	30	V
Gate-source voltage	$V_{GS}$	$\pm 20$	V
Continuous drain current	$I_D$	5.8	A
Drain current pulse (Note1)	$I_{DM}$	20	A
Continuous source-drain diode current	$I_S$	1	A
Power dissipation	$P_D$	1.4	W
Operating junction temperature	$T_J$	+150	$^{\circ}C$
Storage temperature range	$T_{STG}$	-55 to +150	$^{\circ}C$
Thermal resistance junction to ambient (t $\leq$ 10s)	$R_{\theta JA}$	89	$^{\circ}C/W$

## FMOSK3404-Q1

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

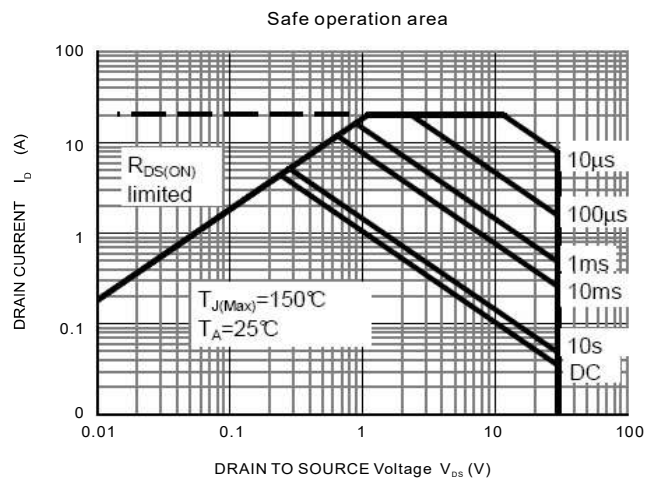
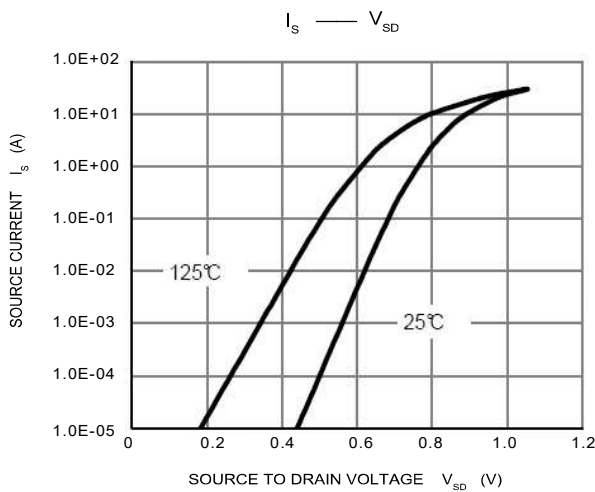
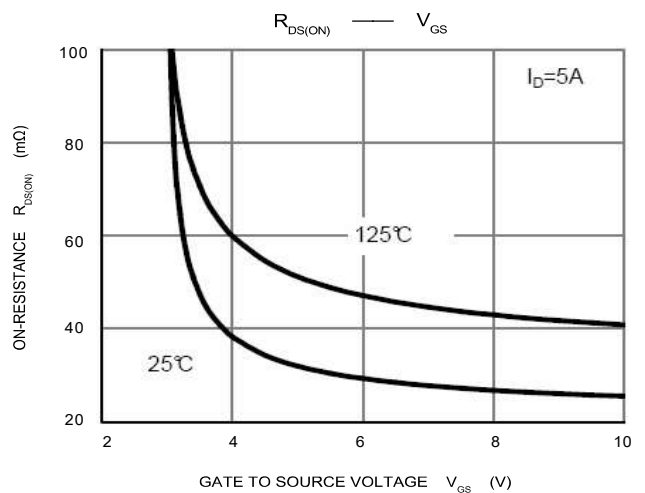
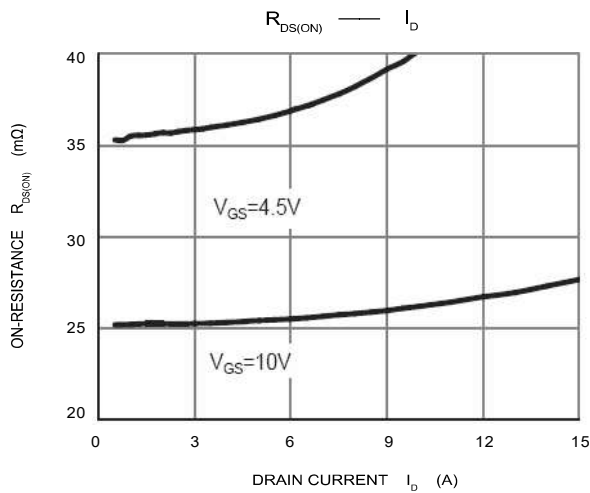
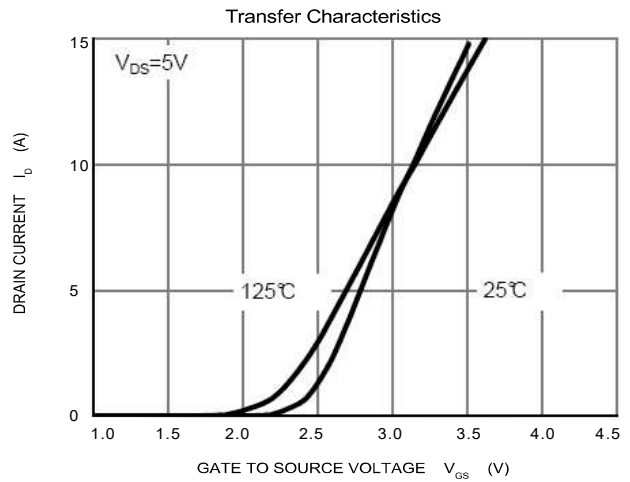
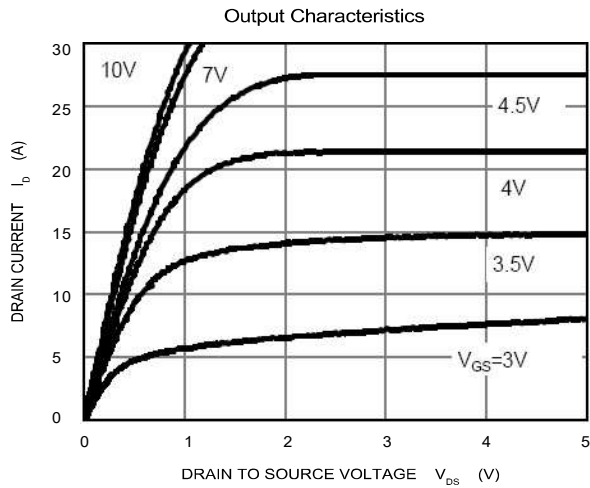
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$ , $V_{GS}=0\text{V}$	30			V
Drain-source leakage current	$I_{DSS}$	$V_{DS}=24\text{V}$ , $V_{GS}=0\text{V}$			0.1	$\mu\text{A}$
Gate-source leakage current	$I_{GSS}$	$V_{GS}=\pm 20\text{V}$			$\pm 100$	nA
<b>On characteristics</b>						
Gate threshold voltage	$V_{GS(TH)}$	$V_{DS}=V_{GS}$ , $I_D=250\mu\text{A}$	1.2	1.6	2.4	V
Static drain-source on-state resistance (note1)	$R_{DS(ON)}$	$V_{GS}=10\text{V}$ , $I_D=5.8\text{A}$		23	52	m $\Omega$
		$V_{GS}=4.5\text{V}$ , $I_D=5\text{A}$		32	35	
Forward transconductance (note1)	$g_{FS}$	$V_{DS}=5\text{V}$ , $I_D=5\text{A}$		15		S
<b>Dynamic parameters</b> (Note 2)						
Input capacitance	$C_{iss}$	$V_{GS}=0\text{V}$ , $V_{DS}=15\text{V}$ , $f=1.0\text{MHz}$		255		pF
Out capacitance	$C_{oss}$			45		
Reverse transfer capacitance	$C_{rss}$			35		
<b>Switching parameters</b> (Note 2)						
Total gate charge	$Q_g$	$V_{GS}=10\text{V}$ , $V_{DS}=15\text{V}$ , $I_D=5\text{A}$		5.2		nC
Gate to source charge	$Q_{gs}$			0.85		
Gate to drain charge	$Q_{gd}$			1.3		
Turn-on delay time	$t_{d(on)}$	$V_{DS}=15\text{V}$ , $V_{GS}=10\text{V}$ , $R_G=3\Omega$ , $R_L=3\Omega$		4.5		ns
Rise time	$t_r$			2.5		
Turn-off delay time	$t_{d(off)}$			14.5		
Fall time	$t_f$			3.5		
<b>Source-drain diode ratings and characteristics</b>						
Drain-source diode forward voltage	$V_{SD}$	$I_S=1\text{A}$ , $V_{GS}=0\text{V}$		0.7	1.0	V
Diode continuous current	$I_S$	$T_C=25^\circ\text{C}$			2.5	A

Note:

1. Pulse test : Pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2\%$ .
2. Guaranteed by design, not subject to production testing.

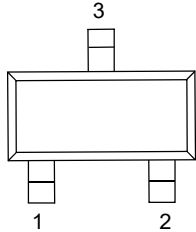
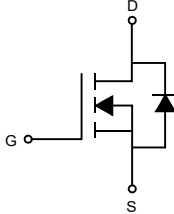
# FMOSK3404-Q1

## Rating and characteristic curves (FMOSK3404-Q1)

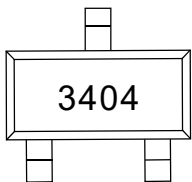


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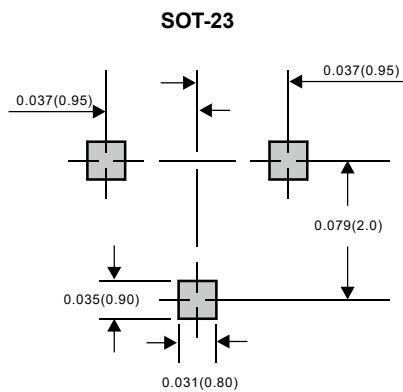
## Pinning information

Pin	Simplified outline	Symbol
Pin1 Gate Pin2 Source Pin3 Drain		

## Marking

Type number	Marking Code
FMOSK3404-Q1	

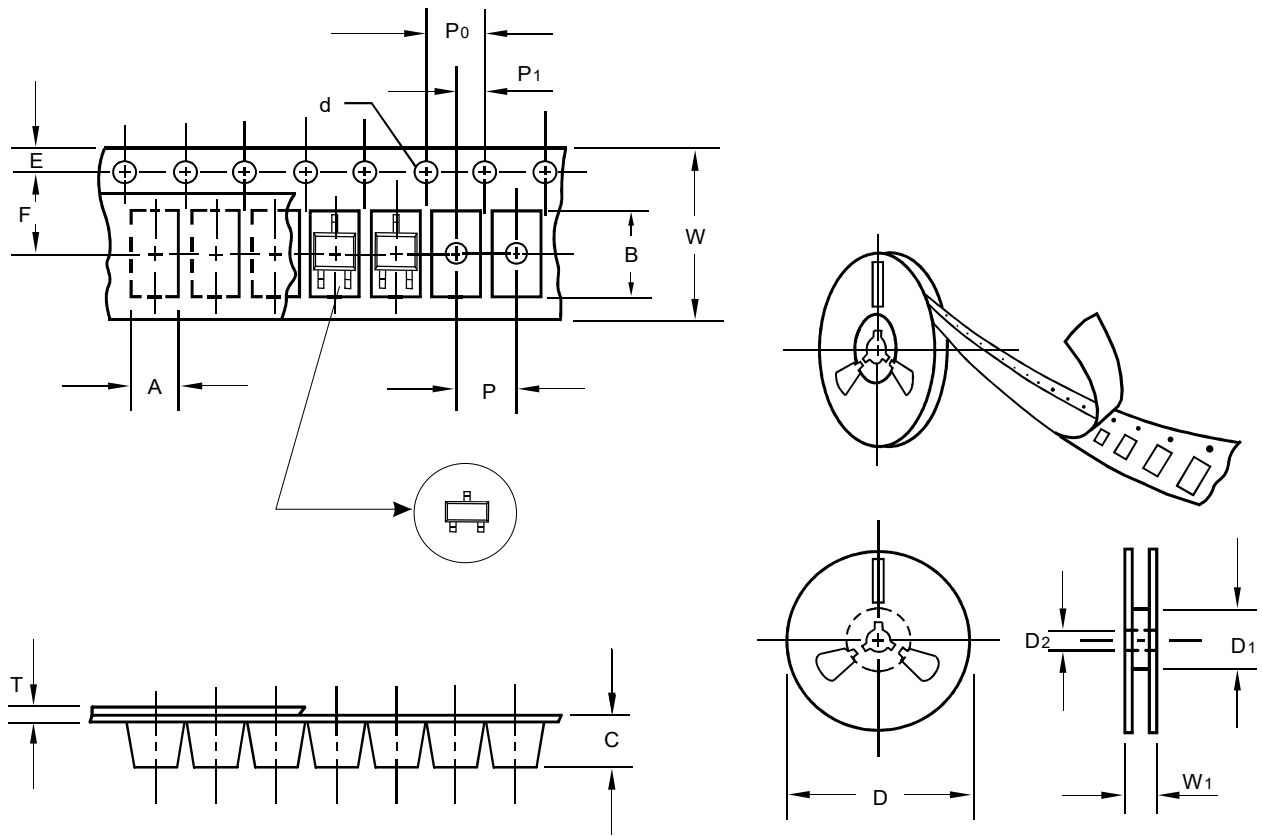
## Suggested solder pad layout



Dimensions in inches and (millimeters)

# FMOSK3404-Q1

## Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
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	11.40

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

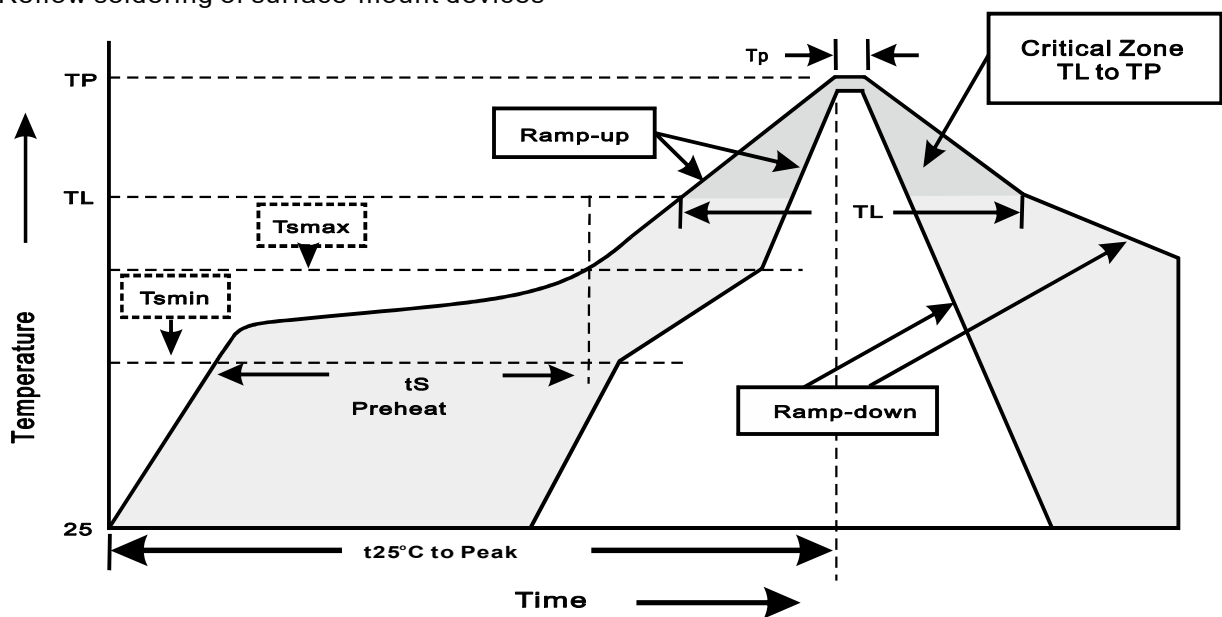
# FMOSK3404-Q1

## 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-23	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 <sub>L</sub> to T <sub>P</sub> )	<3°C/sec
Preheat -Temperature Min(T <sub>smin</sub> ) -Temperature Max(T <sub>smax</sub> ) -Time(min to max)(t <sub>s</sub> )	150°C 200°C 60~120sec
T <sub>smax</sub> to T <sub>L</sub> -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T <sub>L</sub> ) -Time(t <sub>L</sub> )	217°C 60~260sec
Peak Temperature(T <sub>P</sub> )	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t <sub>P</sub> )	10~30sec
Ramp-down Rate	<6°C/sec
Time 25°C to Peak Temperature	<6minutes