

FMBSS84K-Q1-H

List

List.....1

Package outline.....2

Features.....2

Applications.....2

Mechanical data.....2

Maximum ratings2

Electrical characteristics.....3

Rating and characteristics curves.....4

Pinning information.....5

Marking.....5

Suggested solder pad layout.....5

Packing information.....6

Reel packing.....7

Suggested thermal profiles for soldering processes.....7

FMBSS84K-Q1-H

-0.13A -60V P-Channel Enhancement Mode MOSFET ESD Protection

Features

- $-V_{DS} = 60V$, $-I_D = 0.13A$.
- $R_{DS(ON)} \leq 6.3\Omega$, @ $-V_{GS} = 4.5V$, $-I_D = 0.1A$.
- $R_{DS(ON)} \leq 5.2\Omega$, @ $-V_{GS} = 10V$, $-I_D = 0.15A$.
- Energy efficient.
- Low threshold switching.
- High-speed switching.
- Qualified to AEC-Q101 standards for high reliability.
- Lead-free partss meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

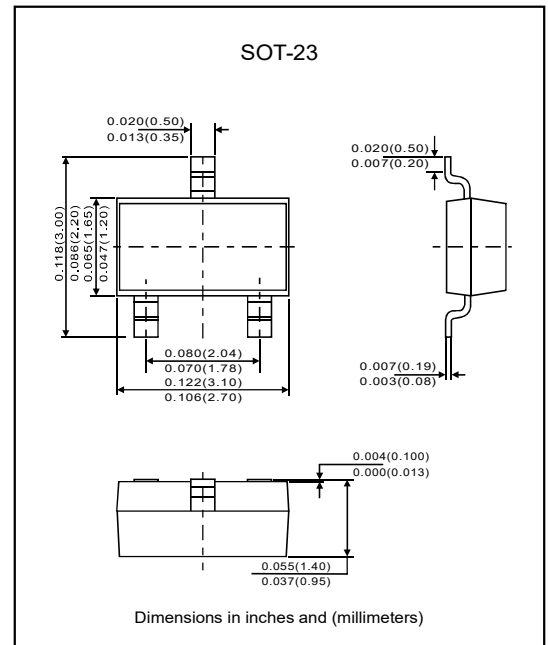
Applications

- DC/DC converters, load switching and power management in portable.
- Battery-powered products such a

Mechanical data

- Epoxy : UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026.
- Weight : Approximated 11mg.

Package outline



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

Parameter	Symbol	Ratings	Unit
Drain-source voltage	$-V_{DS}$	60	V
Gate-source voltage	V_{GS}	± 20	
Continuous drain current	$-I_D$	0.13	A
Pulse drain current tested (note 1)	$-I_{DM}$	0.52	A
Power dissipation	P_D	225	mW
Thermal resistance, junction to ambient (note 2)	$R_{\theta JA}$	556	$^\circ C/W$
Lead temperature for soldering purposes, duration for 5 seconds	T_L	260	$^\circ C$
Junction temperature	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

FMBSS84K-Q1-H

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	$-BV_{\text{DSS}}$	$-I_{\text{D}}=250\mu\text{A}$, $V_{\text{GS}}=0\text{V}$	60			V
Drain-source leakage current	$-I_{\text{DSS}}$	$-V_{\text{DS}}=60\text{V}$, $V_{\text{GS}}=0\text{V}$			1	μA
Gate-source leakage current	I_{GSS}	$V_{\text{GS}}=\pm 20\text{V}$, $V_{\text{DS}}=0\text{V}$			± 10	μA
On characteristics						
Gate threshold voltage (Note 3)	$-V_{\text{GS(TH)}}$	$V_{\text{DS}}=V_{\text{GS}}$, $-I_{\text{D}}=250\mu\text{A}$	1.1	1.6	2.2	V
Static drain-source on-resistance (Note 3)	$R_{\text{DS(ON)}}$	$-V_{\text{GS}}=4.5\text{V}$, $-I_{\text{D}}=0.10\text{A}$		4.8	6.3	Ω
		$-V_{\text{GS}}=10\text{V}$, $-I_{\text{D}}=0.15\text{A}$		4.0	5.2	
Dynamic parameters (Note4)						
Input capacitance	C_{iss}	$V_{\text{GS}}=0\text{V}$, $-V_{\text{DS}}=5\text{V}$, $f=1.0\text{MHz}$		28.60		pF
Output capacitance	C_{oss}			4.00		
Reverse transfer capacitance	C_{rss}			2.45		
Switching parameters (Note4)						
Turn-on delay time	$t_{\text{D(ON)}}$	$-V_{\text{DD}}=15\text{V}$, $R_{\text{L}}=50\Omega$, $-I_{\text{O}}=2.5\text{A}$		4.8		ns
Rise time	t_{r}			19.0		
Turn-off delay time	$t_{\text{D(OFF)}}$			52.0		
Fall time	t_{f}			32.0		
Source-drain diode ratings and characteristics						
Drain - source diode forward voltage (Note 3)	$-V_{\text{SD}}$	$-I_{\text{S}}=0.13\text{A}$, $V_{\text{GS}}=0\text{V}$			2.2	V
Continuous current	$-I_{\text{S}}$				0.20	A
Pulsed current	$-I_{\text{SM}}$				0.80	A

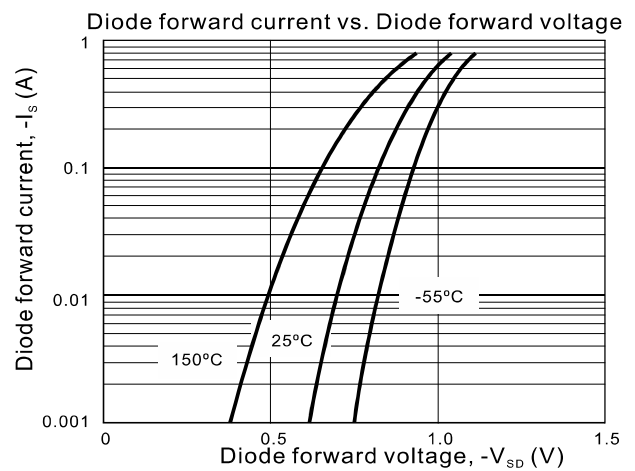
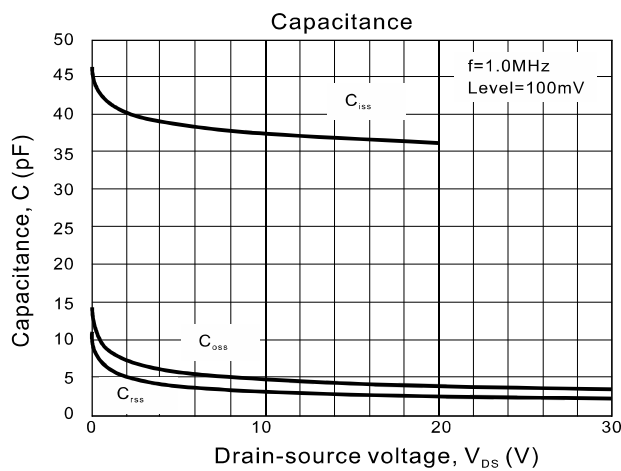
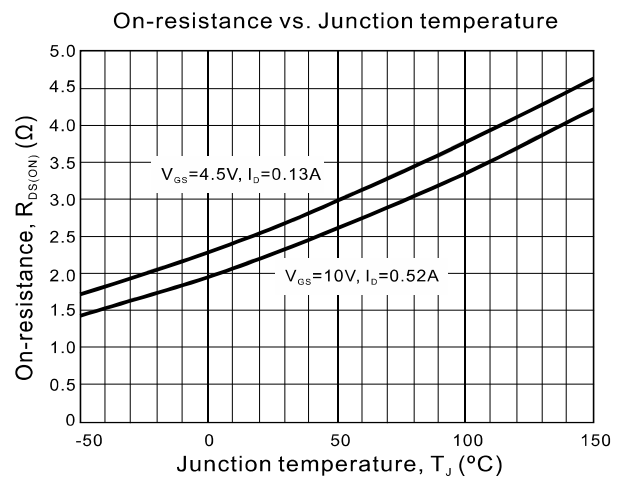
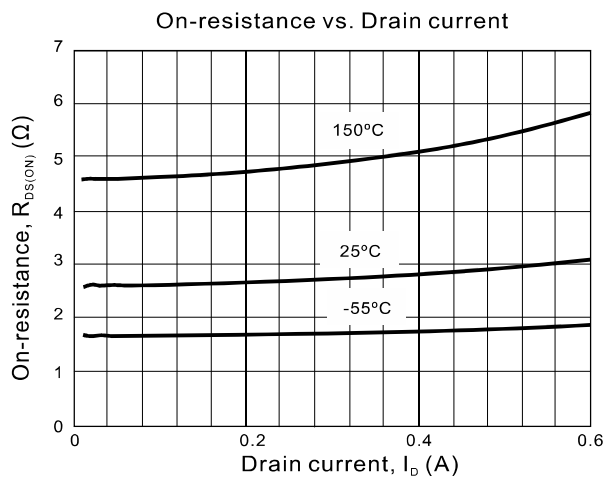
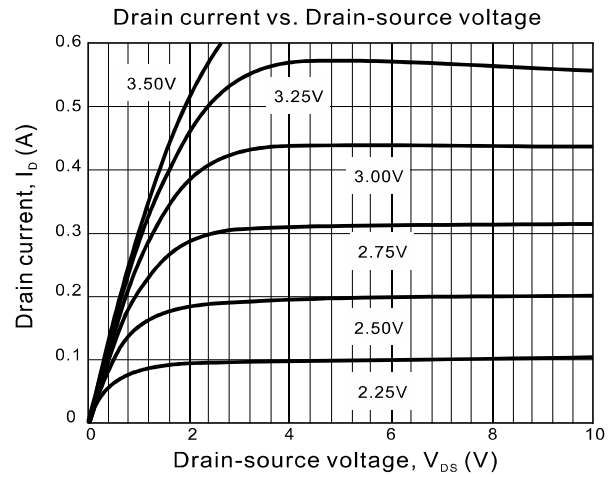
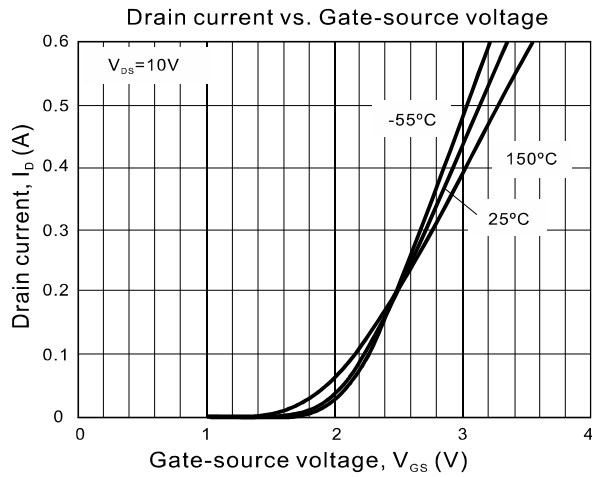
Note : 1.Repetitive rating : pulse width limited by junction temperature.

2.Surface mounted on FR4 board, $t \leq 10\text{s}$.3.Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

4.Guaranteed by design, not subject to producing.

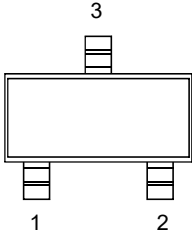
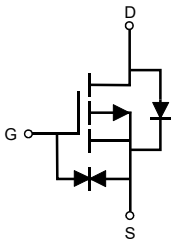
FMBSS84K-Q1-H

Rating and characteristic curves



FMBSS84K-Q1-H

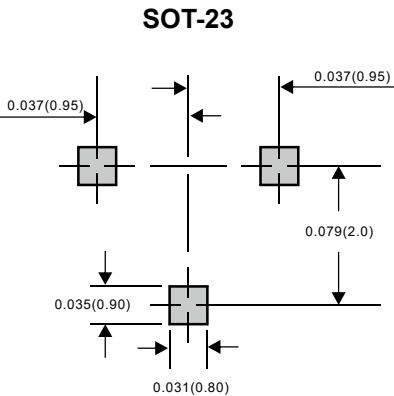
Pinning information

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

Marking

Type number	Marking code
FMBSS84K-Q1-H	B84K, 84K

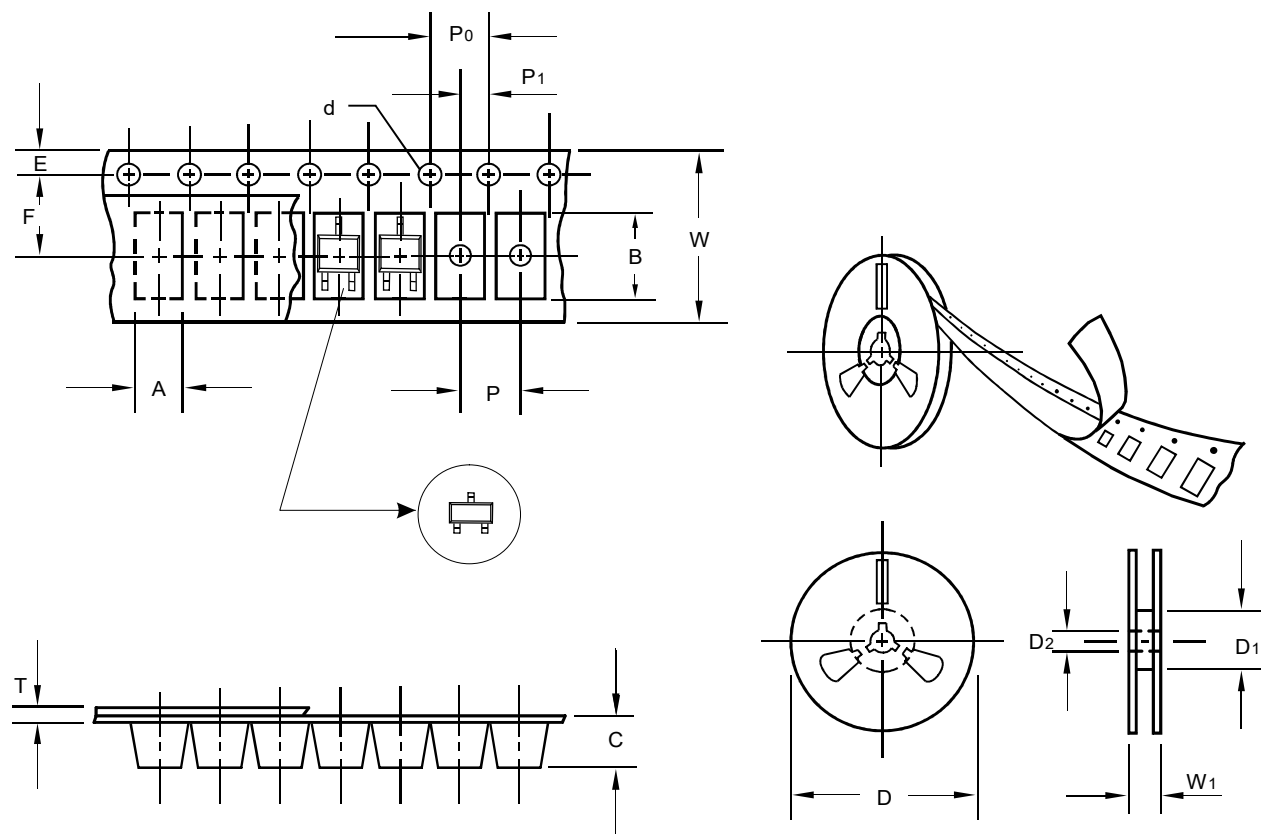
Suggested solder pad layout



Dimensions in inches and (millimeters)

FMBSS84K-Q1-H

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.3	3.15
Carrier length	B	0.3	2.77
Carrier depth	C	0.3	1.22
Sprocket hole	d	0.3	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	55.00
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	0.3	0.23
Tape width	W	0.3	8.00
Reel width	W1	3.0	12.0

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

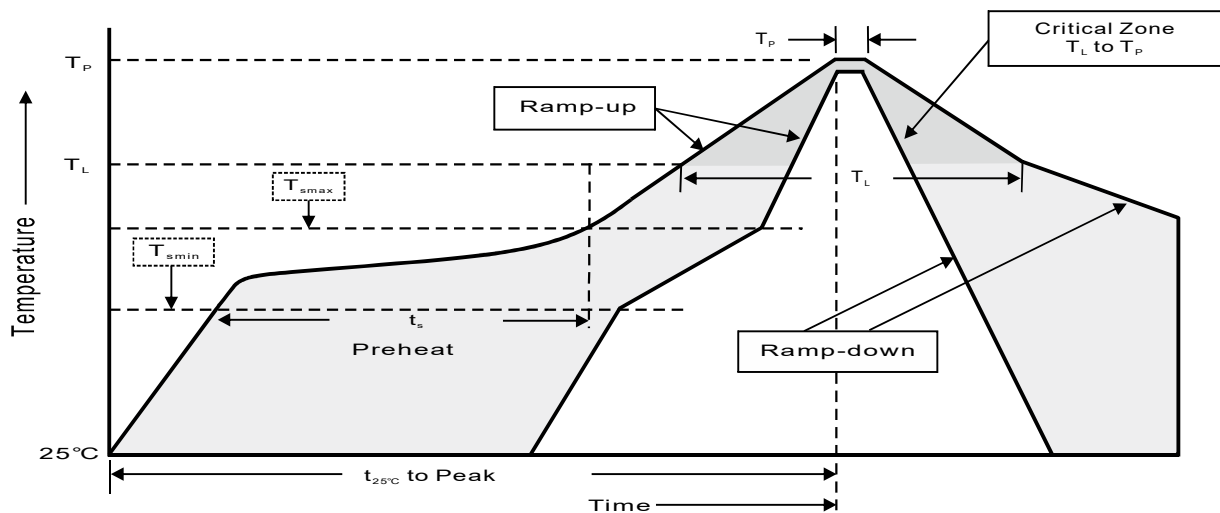
FMBSS84K-Q1-H

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-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000

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_{min}) - Temperature Max (T_{max}) - 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