

FMOSAB3002AK

List

List.....	1
Package outline.....	2
Features.....	2
Mechanical data.....	2
Maximum ratings	2
Electrical characteristics.....	3
Rating and characteristic curves.....	4~5
Pinning information.....	6
Marking.....	6
Suggested solder pad layout.....	6
Packing information.....	7
Reel packing.....	8
Suggested thermal profiles for soldering processes.....	8

100A 30V N-Channel Enhancement Mode Power MOSFET

- $V_{DS}=30V$, $I_D=100A$.
- $R_{DS(ON)} \leq 3.0m\Omega$ @ $V_{GS}=10V$, $I_D=30A$.
- $R_{DS(ON)} \leq 4.7m\Omega$ @ $V_{GS}=4.5V$, $I_D=20A$.
- Advanced trench technology.
- Excellent $R_{DS(ON)}$ and low gate charge.
- ESD Protected 2KV (Human body mode).
- 100% UIS and ΔV_{DS} tested.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part. ex. FMOSAB3002AK-H.

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

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, T333P8.
- Mounting Position : Any.
- Weight : Approximated 0.02 gram.

[illegible]

Parameter		Symbol	Ratings	Unit
Drain-source voltage		V_{DS}	30	V
Gate-source voltage		V_{GS}	±20	V
Continuous drain current	$T_c=25^{\circ}\text{C}$	I_D	100	A
	$T_c=100^{\circ}\text{C}$		63	
Pulsed drain current (Note 1)		I_{DM}	400	A
Avalanche current (Note 2)		I_{AS}	32	A
Avalanche energy, single pulse (Note 2)		E_{AS}	256	mJ
Power dissipation	$T_c=25^{\circ}\text{C}$	P_D	42	W
Thermal resistance, junction to ambient (Note 3)		$R_{\theta JA}$	38	$^{\circ}\text{C/W}$
Thermal resistance Junction to case		$R_{\theta JC}$	3	$^{\circ}\text{C/W}$
Operating Junction temperature		T_J	+150	$^{\circ}\text{C}$
Storage temperature range		T_{STG}	-55 to +150	$^{\circ}\text{C}$

FMOSAB3002AK

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

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	I _D =250μA, V _{GS} =0V	BV _{DSS}	30			V
Drain-source leakage current	V _{DS} =30V, V _{GS} =0V	I _{DSS}			1.0	μA
Gate-source leakage current	V _{GS} =±20V, V _{DS} =0V	I _{GSS}			±100	nA
On characteristics						
Gate threshold voltage	V _{GS} =V _{DS} , I _D =250μA	V _{GS(TH)}	1.3	1.9	2.5	V
Static drain-source on-resistance (Note 4)	V _{GS} =10V, I _D =30A	R _{DS(ON)}		2.3	3.0	mΩ
	V _{GS} =4.5V, I _D =20A			3.6	4.7	
Dynamic parameters						
Static drain-source On-resistance (Note 4)	f=1MHz	R _g	0.4	0.9	1.4	Ω
Input capacitance	V _{GS} =0V, V _{DS} =15V, f=1.0MHz	C _{iss}		5065		pF
Out capacitance		C _{oss}		574		
Reverse transfer capacitance		C _{rss}		472		
Switching parameters						
Total gate charge	V _{GS} =0 to 10V, V _{DS} =15V, I _D =30A	Q _g		97		nC
Gate to source charge		Q _{gs}		20		
Gate to drain charge		Q _{gd}		23		
Turn-on delay time	V _{DS} =15V, V _{GS} =10V, I _D =30A, R _G =3Ω	t _{d(on)}		16		ns
Rise time		t _r		30		
Turn-off delay time		t _{d(off)}		54		
Fall time		t _f		19		
Source-drain diode ratings and characteristics						
Maximum continuous drain to source diode forward current		I _S			100	A
Maximum pulsed drain to source diode forward current		I _{SM}			400	A
Drain-source diode forward voltage (Note 4)	I _{SD} =30A, V _{GS} =0V	V _{SD}			1.2	V
Reverse recovery time	I _F =30A, di/dt=100A/μs	t _{rr}		23		ns
Reverse recovery charge		Q _{rr}		14		nC

Note : 1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.

2. E_{AS} condition: Starting $T_J=25^{\circ}\text{C}$, $V_{DS}=15\text{V}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=32\text{A}$ 3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB4. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$.

FMOSAB3002AK

Rating and characteristic curves

Figure 1: Output Characteristics

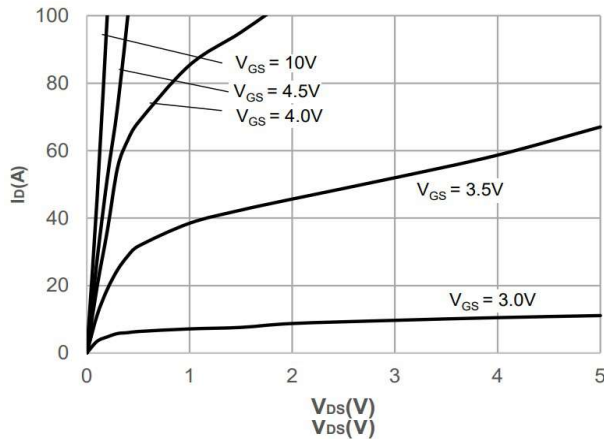


Figure 2: Typical Transfer Characteristics

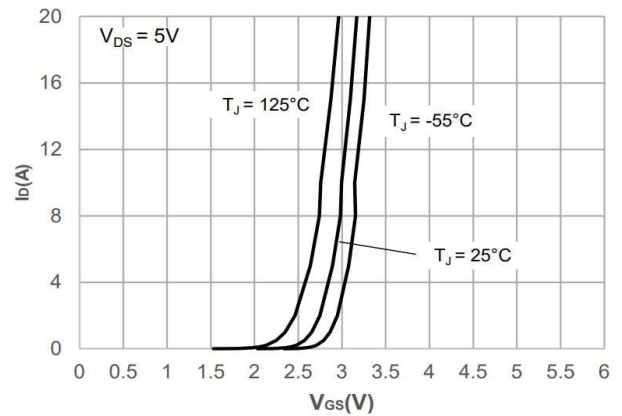


Figure 3: On-resistance vs. Drain Current

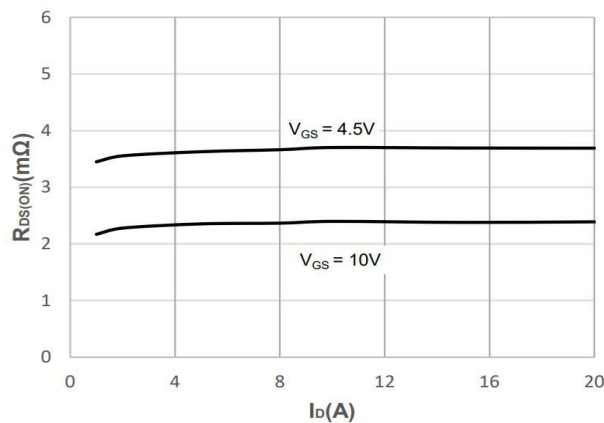


Figure 4: Body Diode Characteristics

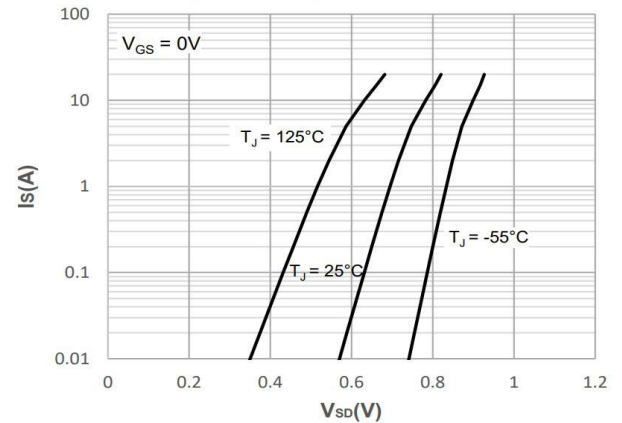


Figure 5: Gate Charge Characteristics

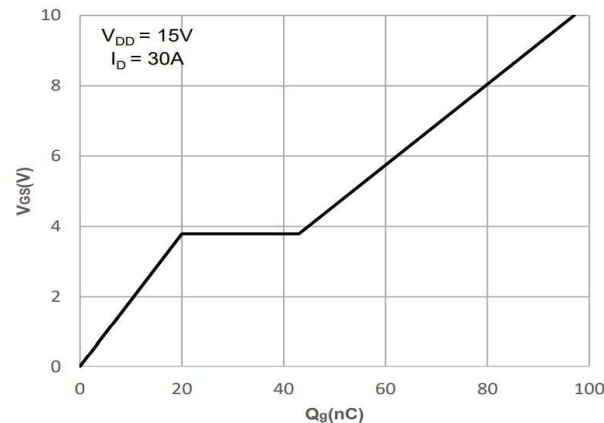
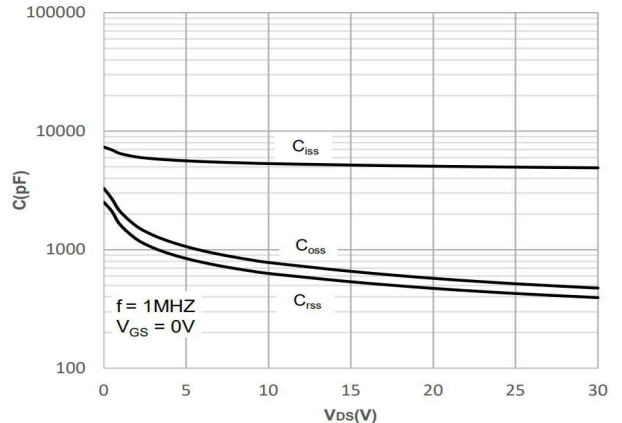


Figure 6: Capacitance Characteristics



FMOSAB3002AK

Rating and characteristic curves

Figure 7: Normalized Breakdown voltage vs. Junction Temperature

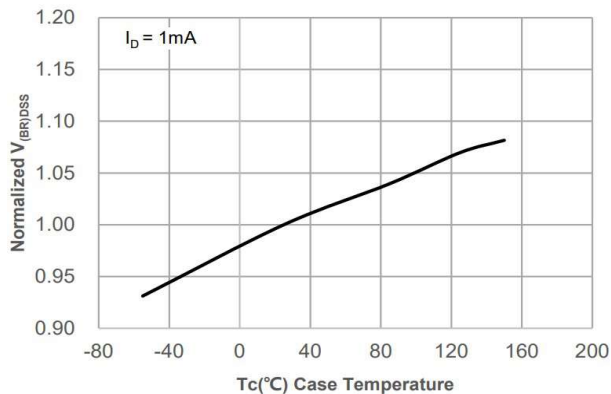


Figure 8: Normalized on Resistance vs. Junction Temperature

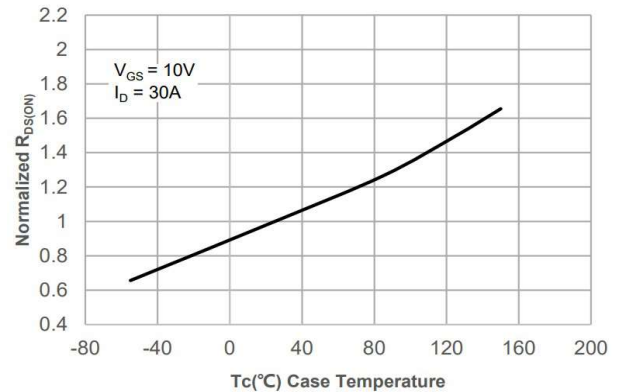


Figure 9: Maximum Safe Operating Area

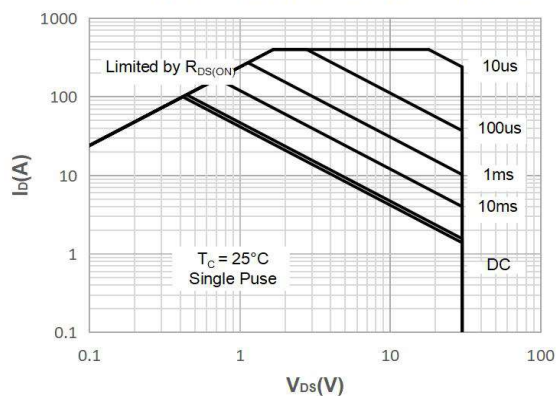


Figure 10: Maximum Continuous Drian Current vs. Case Temperature

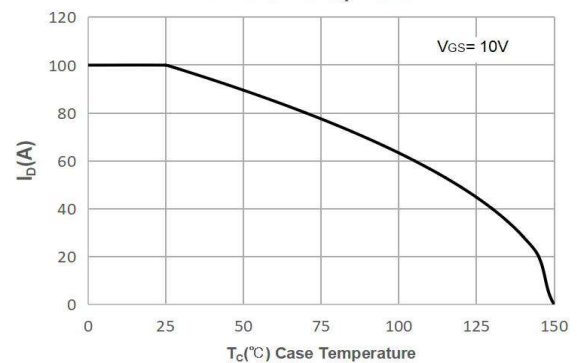


Figure 11: Normalized Maximum Transient Thermal Impedance

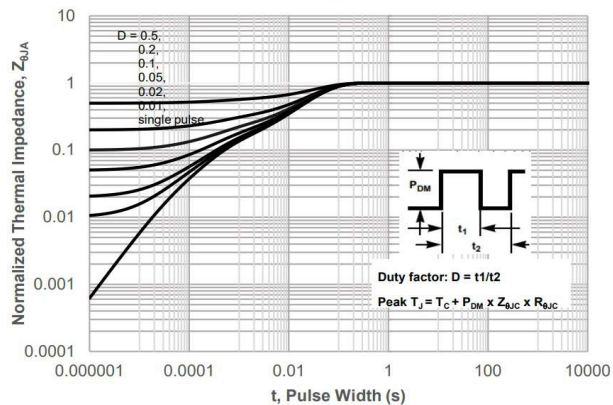
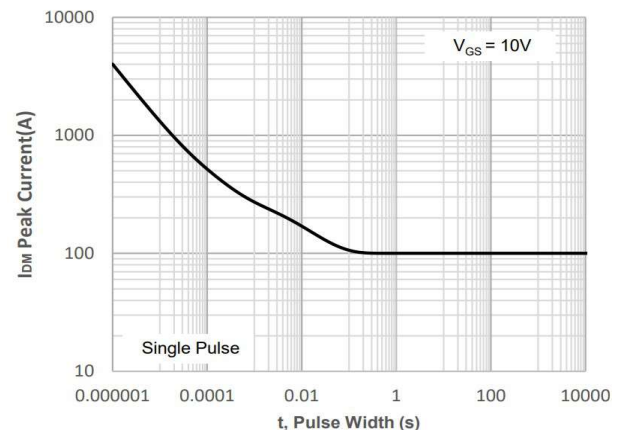
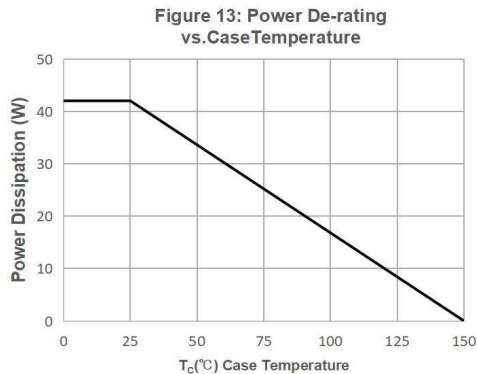


Figure 12: Peak Current Capacity



FMOSAB3002AK

Rating and characteristic curves



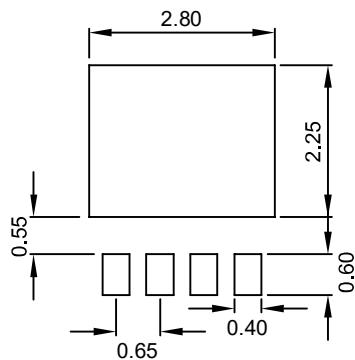
Pinning information

Pin	Simplified outline	Symbol
Pin1, 2, 3 Source Pin4 Gate Pin5, 6, 7, 8 Drain		

Marking

Type number	Marking Code
FMOSAB3002AK	AB3002AK

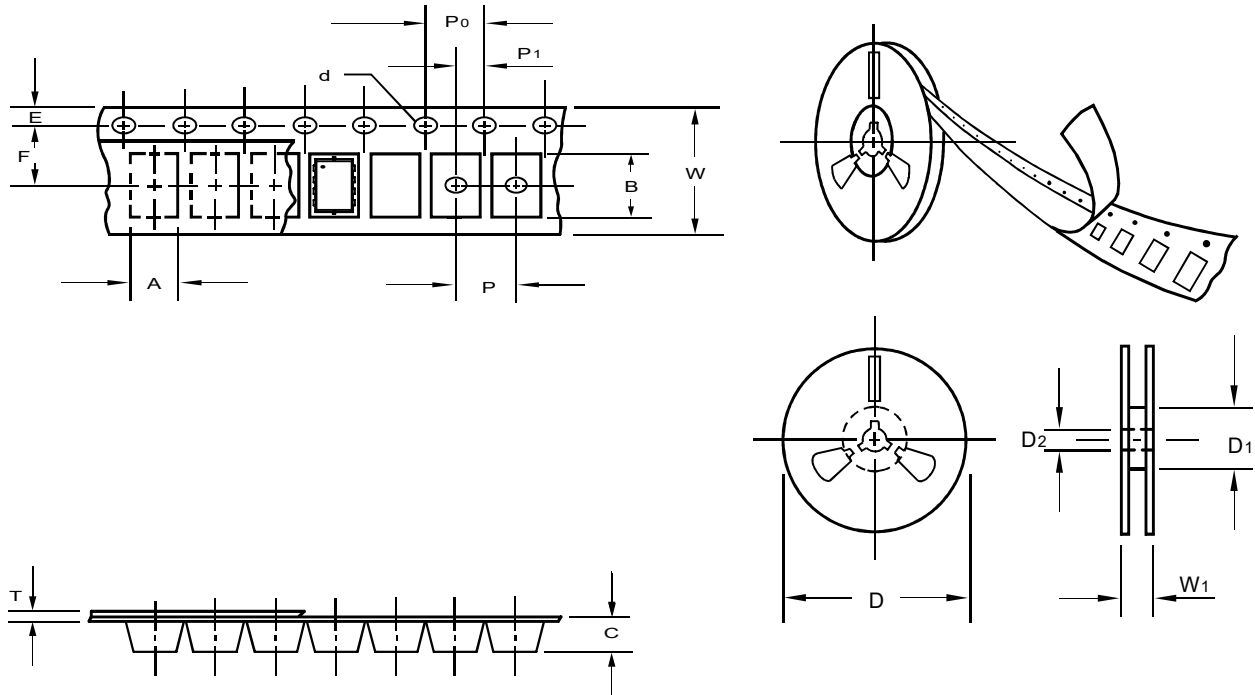
Suggested solder pad layout



Note:
1.Controlling dimension:in millimeters.
2.General tolerance:±0.05mm.
3.The pad layout is for reference purposes only.

FMOSAB3002AK

Packing information



unit:mm

Item	Symbol	Tolerance	T3333P8
Carrier width	A	0.1	3.55
Carrier length	B	0.1	3.55
Carrier depth	C	0.1	1.10
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	100.00
7" Reel outside diameter	D	2.0	-
7" Reel inner diameter	D1	min	-
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	5.50
Punch hole pitch	P	0.1	8.00
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	12.00
Reel width	W1	1.0	17.60

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

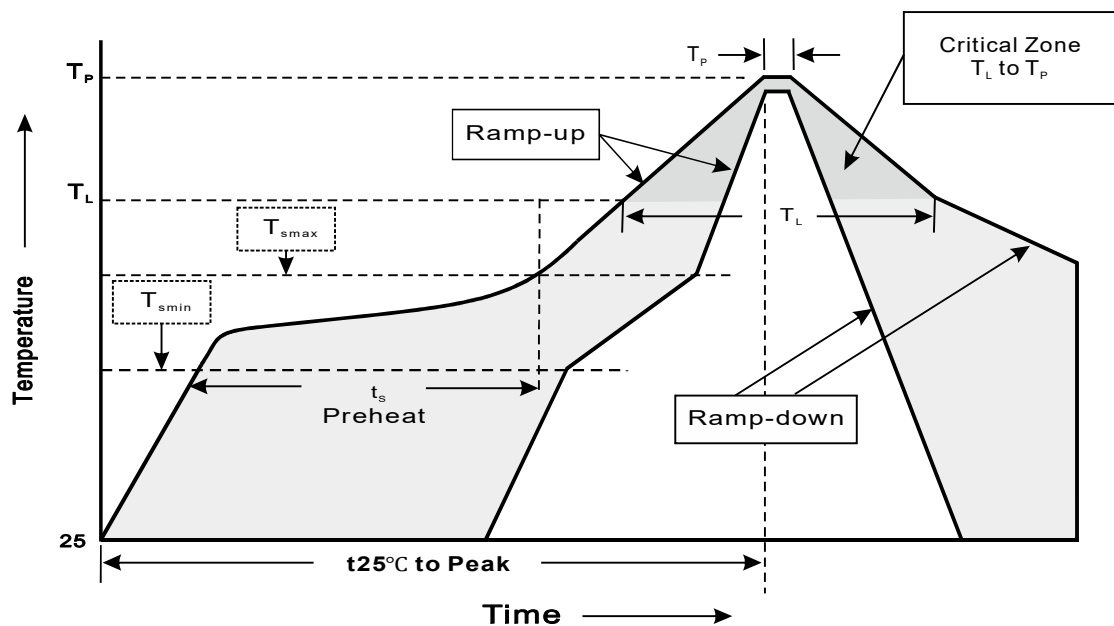
FMOSAB3002AK

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)
T3333P8	13"	5,000	8.0	10,000	355*335*38	330	350*330*360	80,000

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 ~ 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