

FMOSAC31DN10-H

List

List.....1

Package outline.....2

Features.....2

Mechanical data.....2

Maximum ratings.....2

Electrical characteristics.....3

Rating and characteristic curves.....4~6

Pinning information.....7

Marking.....7

Suggested solder pad layout.....7

Packing information.....8

Reel packing.....9

Suggested thermal profiles for soldering processes.....9

FMOSAC31DN10-H

54A 100V Dual N-Channel Enhancement Mode Power MOSFET

Features

- $V_{DS}=100V$, $I_D=54A$.
- $R_{DS(ON)} \leq 19m\Omega$, @ $V_{GS}=10V$, $I_D=20A$.
- $R_{DS(ON)} \leq 25m\Omega$, @ $V_{GS}=4.5V$, $I_D=15A$.
- Excellent on-resistance and low gate charge.
- 100% UIS tested and 100% ΔV_{ds} tested.
- Lead-free parts meet RoHS requirements.

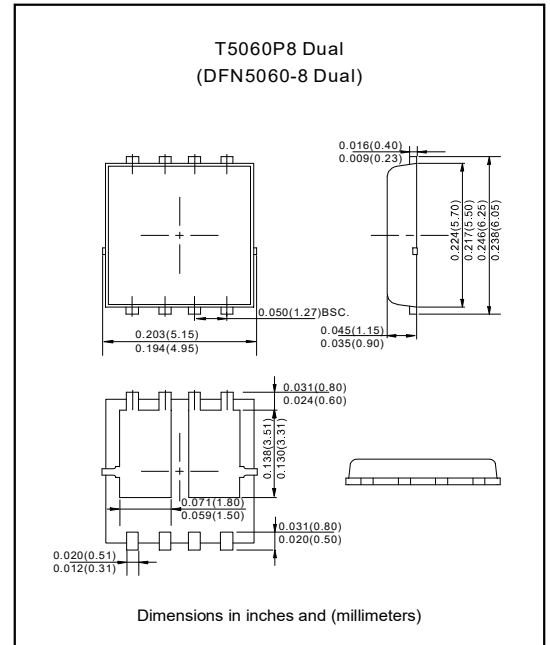
Application

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

Mechanical data

- Epoxy: UL94-V0 rated flame retardant.
- Case : Molded plastic, T5060P8 Dual (DFN5060-8 Dual).
- Weight : Approximated 105mg.

Package outline



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

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V_{DS}	100	V
Gate-source voltage	V_{GS}	± 20	V
Continuous drain current ($T_c=25^\circ C$) ($T_c=100^\circ C$)	I_D	54	A
		34	
Pulsed drain current (Note 1)	I_{DM}	Refer to fig.4	A
Single pulse avalanche energy (Note 2)	E_{AS}	74	mJ
Power dissipation ($T_c=25^\circ C$) ($T_c=100^\circ C$)	P_D	104	W
		42	
Thermal resistance, junction to ambient (Note 3)	$R_{\theta JA}$	44	$^\circ C/W$
Thermal resistance, junction to case	$R_{\theta JC}$	1.2	$^\circ C/W$
Operating Junction temperature	T_J	+150	$^\circ C$
Storage temperature range	T_{STG}	-55 to +150	$^\circ C$

FMOSAC31DN10-H

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Drain-source leakage current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1.0	μA
Gate-source leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
On characteristics						
Gate threshold voltage	V _{GS(TH)}	V _{GS} =V _{DS} , I _D =250μA	1.1	1.6	2.1	V
Static drain-source on-resistance (Note 4)	R _{DS(ON)}	V _{GS} =10V, I _D =20A		14	19	mΩ
		V _{GS} =4.5V, I _D =15A		19	25	
Dynamic parameters						
Gate resistance	R _G	f=1.0MHz		1.5		Ω
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =50V, f=1.0MHz	692	969	1308	pF
Out capacitance	C _{oss}		235	329	445	
Reverse transfer capacitance	C _{rss}		14	19	26	
Switching parameters						
Total gate charge	Q _g	V _{GS} =0 to 10V, V _{DS} =50V, I _D =20A	13	18	25	nC
Gate to source charge	Q _{gs}			4		
Gate to drain charge	Q _{gd}			4.6		
Turn-on delay time	t _{d(on)}	V _{DD} =50V, V _{GS} =10V, R _G =6.2Ω, I _D =20A		8		ns
Rise time	t _r			19		
Turn-off delay time	t _{d(off)}			22		
Fall time	t _f			9		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 4)	V _{SD}	I _S =20A, V _{GS} =0V			1.2	V
Maximum continuous body diode forward current	I _S				54	A
Maximum pulsed body diode forward current	I _{SM}				217	A
Body diode reverse recovery time	t _{rr}	I _F =20A, dI _F /dt =100A/μs	23	32	44	ns
Body diode reverse recovery charge	Q _{rr}			30		nC

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

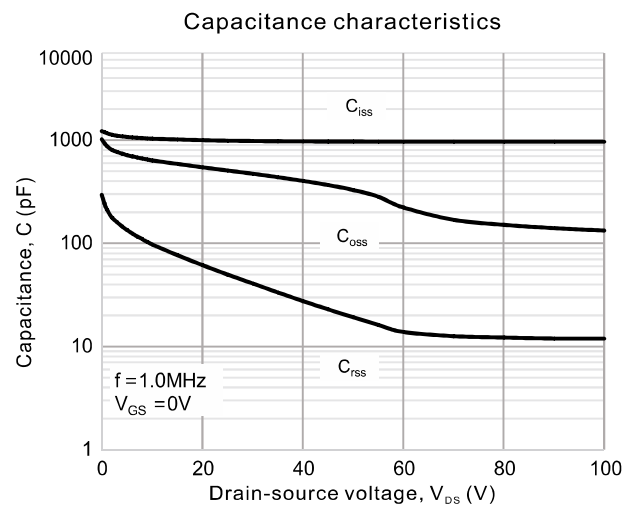
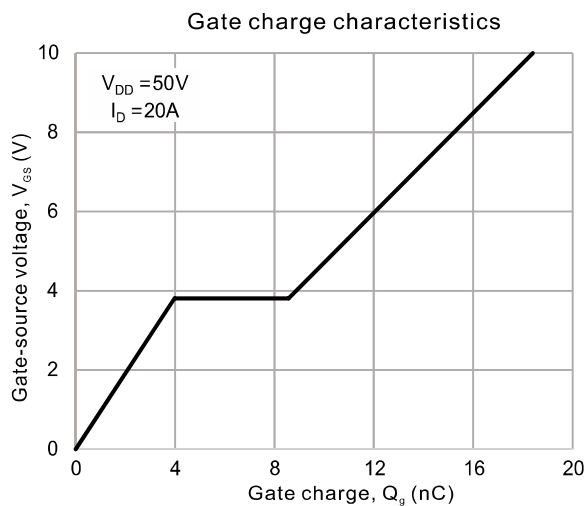
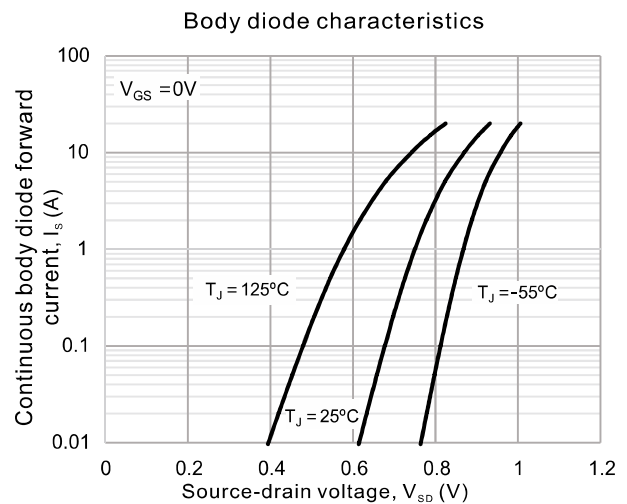
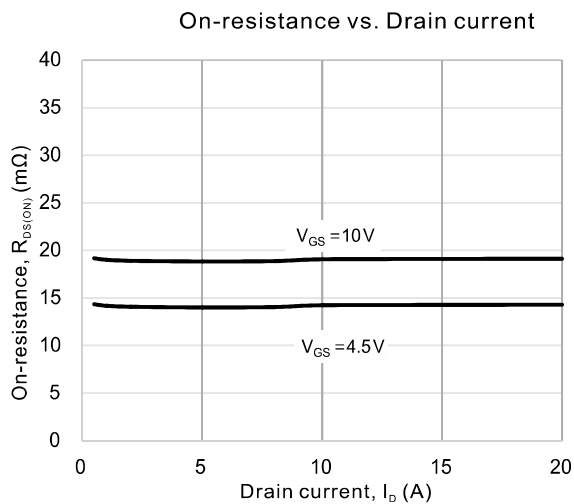
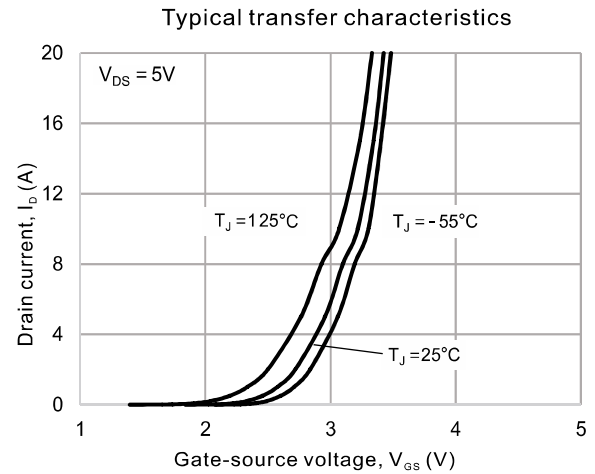
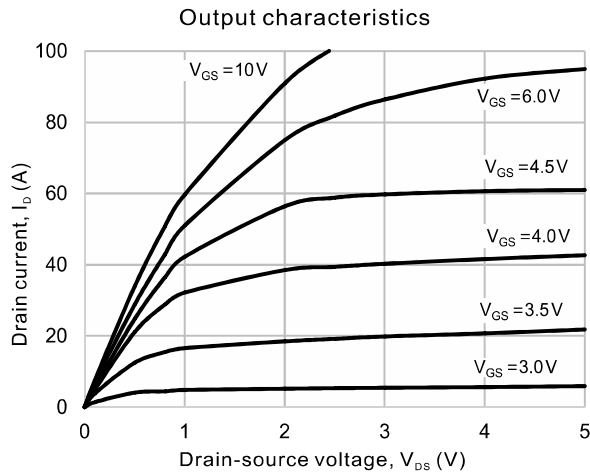
2. E_{AS} condition: starting $T_J=25^{\circ}\text{C}$, $V_{DD}=50\text{V}$, $V_G=10\text{V}$, $R_G=25\Omega$, $L=0.5\text{mH}$, $I_{AS}=7\text{A}$, $V_{DD}=0\text{V}$ during time in avalanche.

3. $R_{\theta JA}$ is measured with the device mounted on a 1inch² pad of 2oz copper FR4 PCB.

4.Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 0.5\%$.

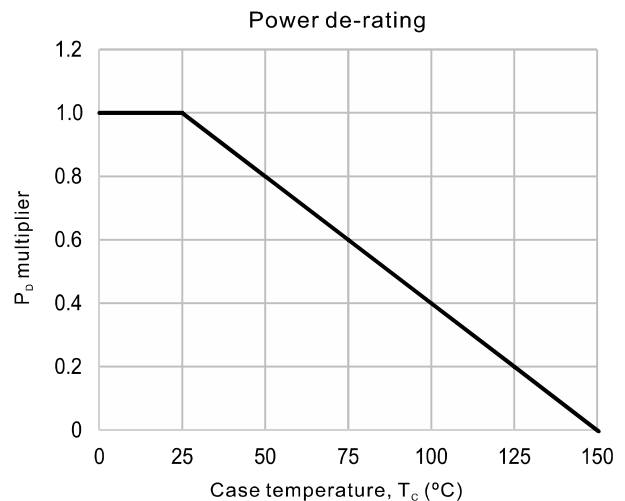
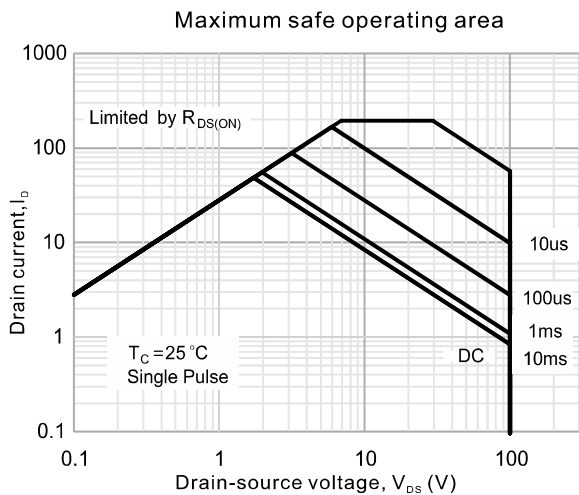
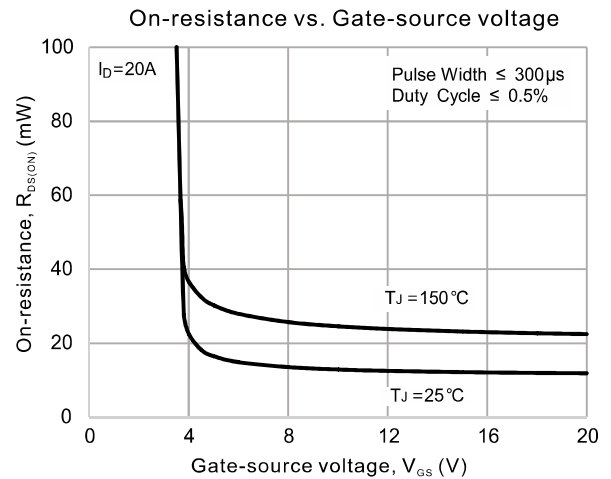
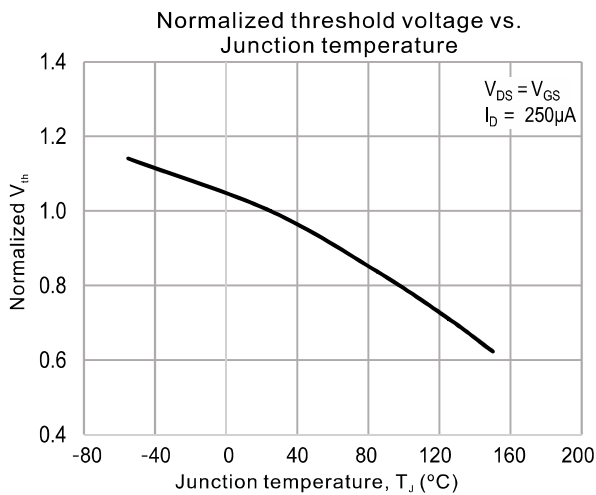
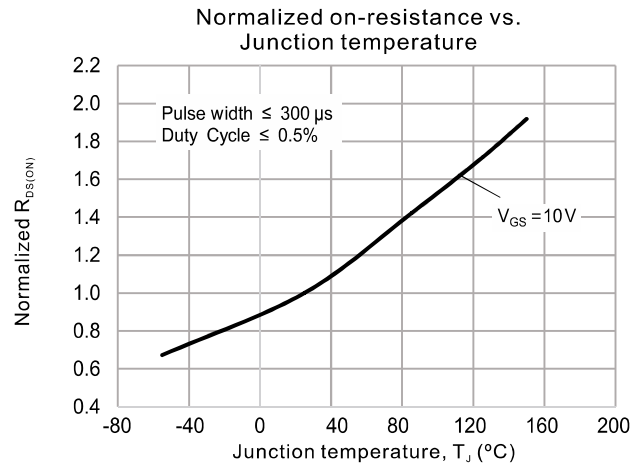
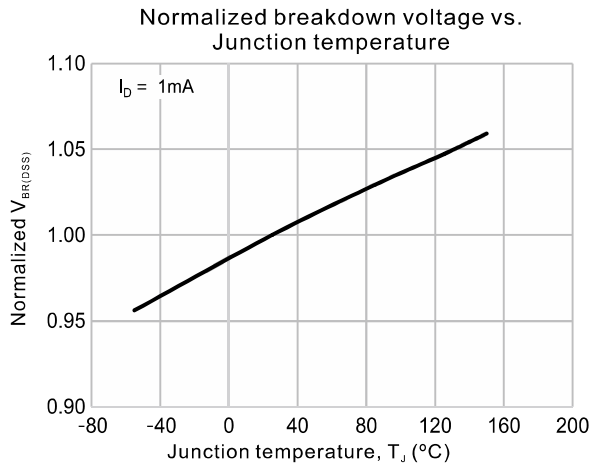
FMOSAC31DN10-H

Rating and characteristic curves



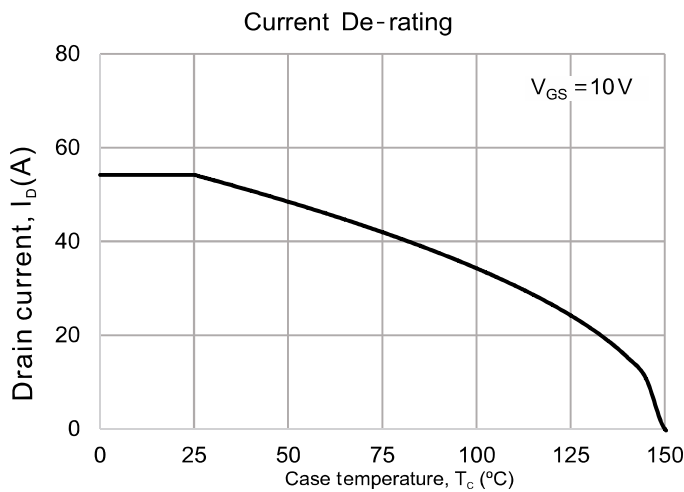
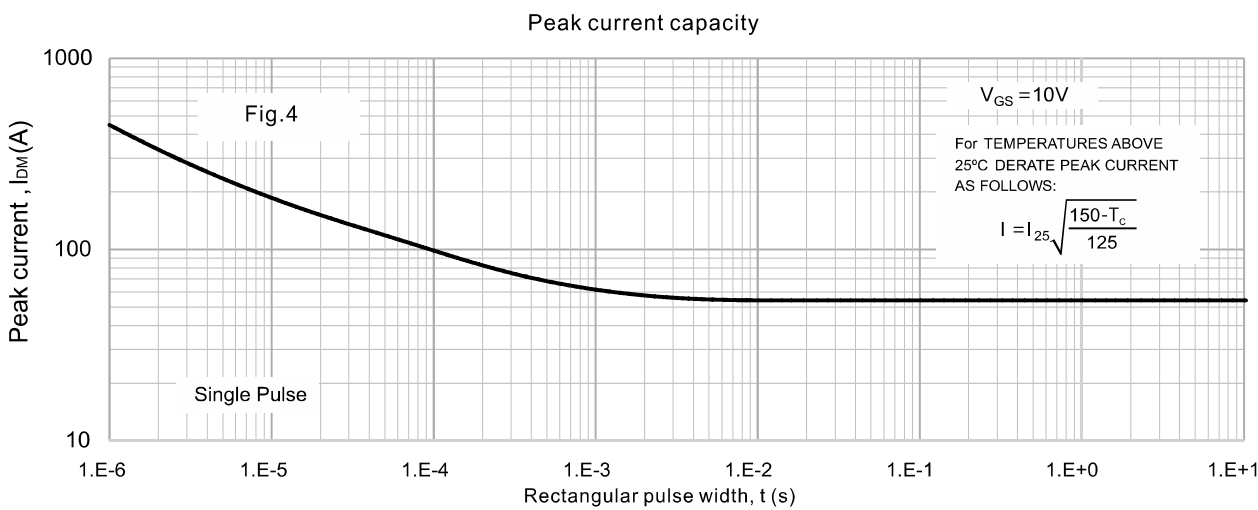
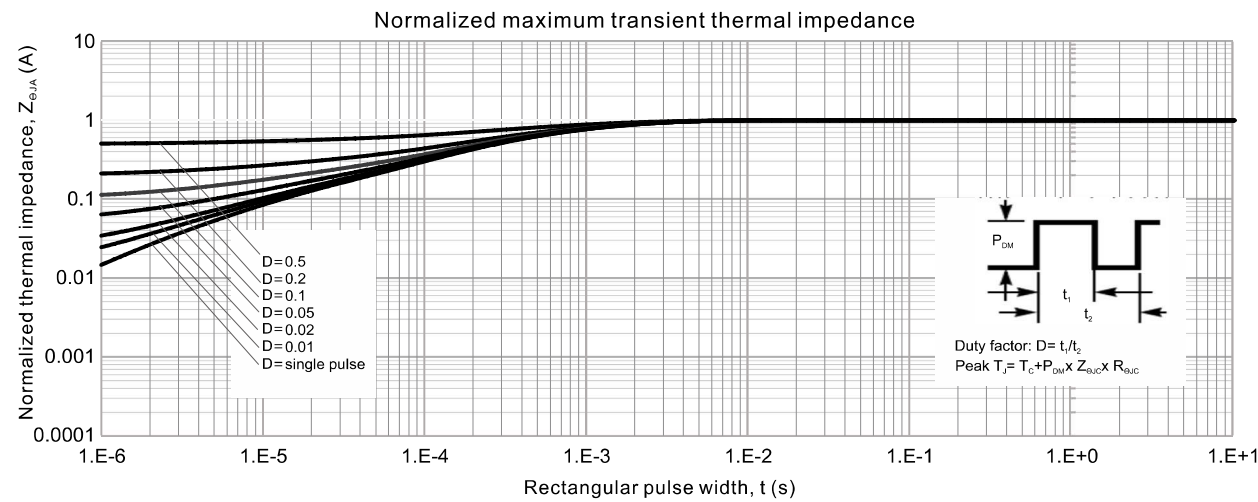
FMOSAC31DN10-H

Rating and characteristic curves



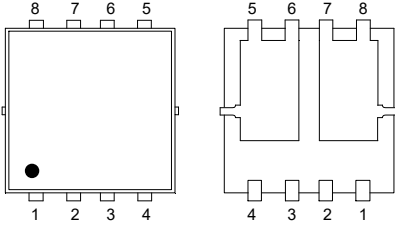
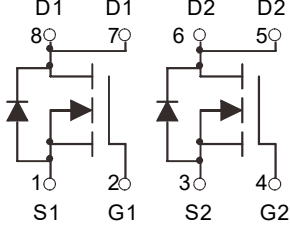
FMOSAC31DN10-H

Rating and characteristic curves



FMOSAC31DN10-H

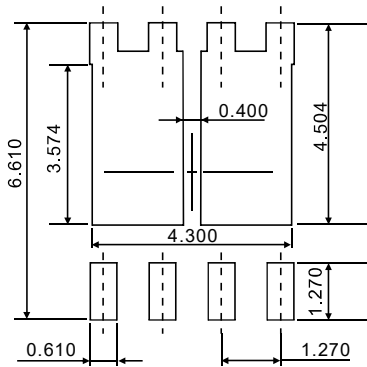
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Source 1 Pin 2 Gate 1 Pin 3 Source 2 Pin 4 Gate 2 Pin 5, 6 Drain 2 Pin 7, 8 Drain 1		

Marking

Type number	Marking code
FMOSAC31DN10-H	L1018PD

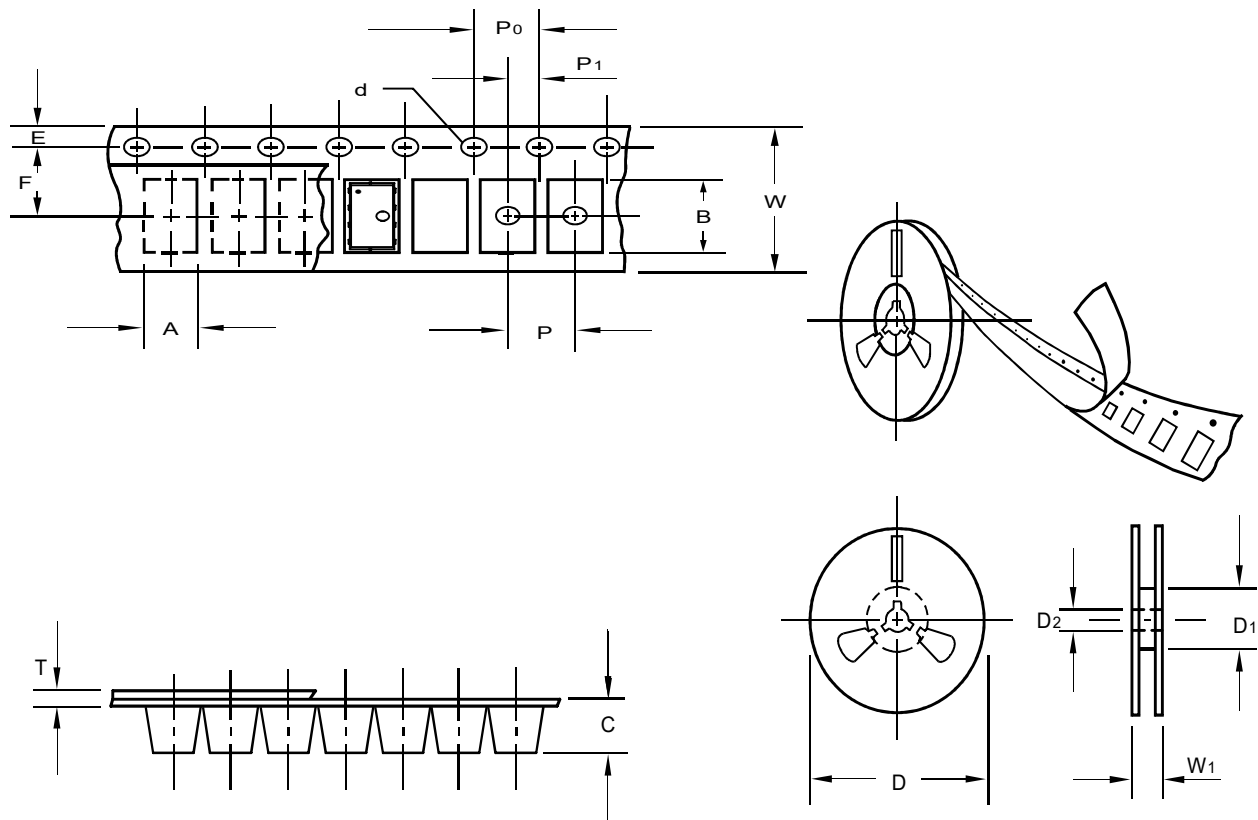
Suggested solder pad layout



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

FMOSAC31DN10-H

Packing information



unit:mm

Item	Symbol	Tolerance	T5060P8 Dual
Carrier width	A	0.1	6.40
Carrier length	B	0.1	5.40
Carrier depth	C	0.1	1.25
Sprocket hole	d	0.1	1.55
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	0.30
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.

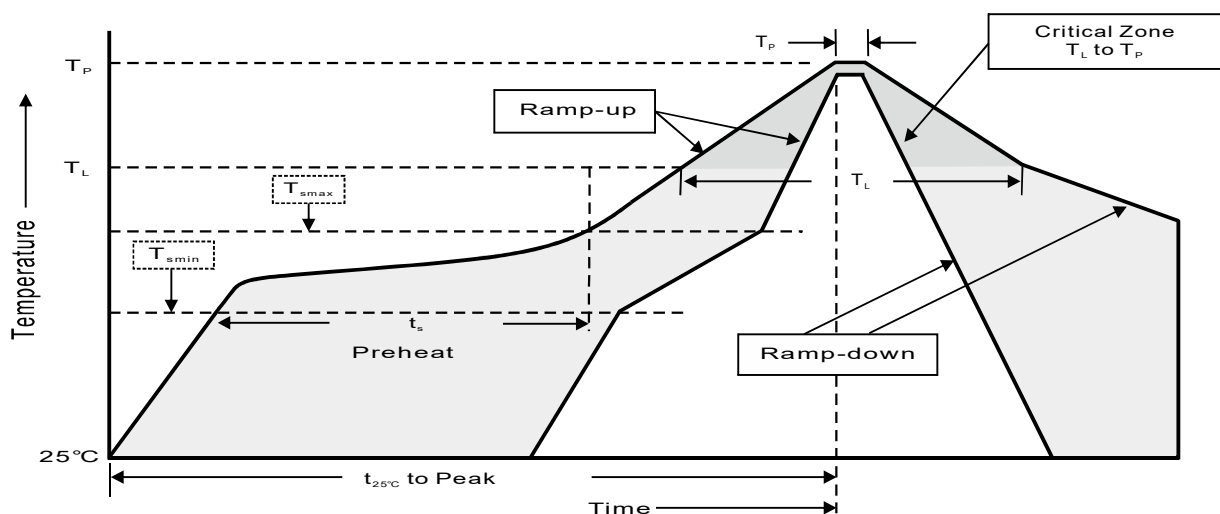
FMOSAC31DN10-H

Reel packing

Device	Outline	Device Package	Reel Size	Reel (pcs)
FMOSAC31DN10-H	Taping	T5060P8	13 inch	5,000

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 ~ 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