

FMOSATA3430

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FMOSATA3430

Dual N-Channel Enhancement Mode MOSFET

Features

- $V_{DS}=30V$, $I_{D_{(Die1)}}=77A$, $I_{D_{(Die2)}}=189A$.
- Low on-resistance.
- 100% E_{AS} guaranteed.
- High current capability.
- Advanced trench MOS technology.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSATA3430-H.

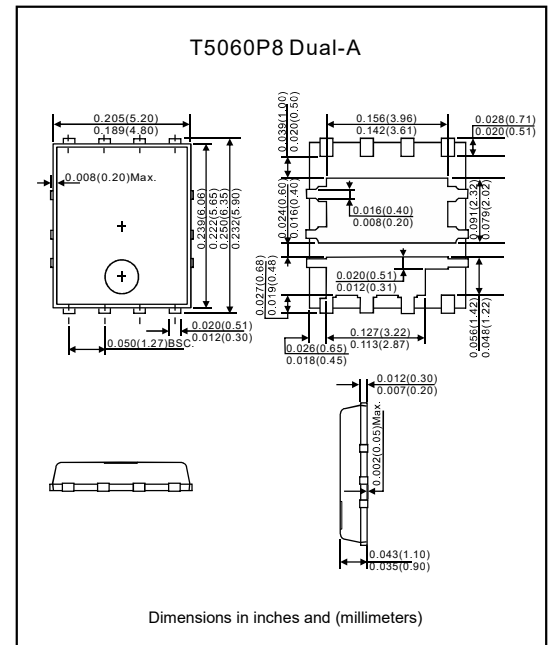
Applications

- Power management in desktop computer.
- DC/DC converters.
- Isolated DC/DC converters in telecom and industrial.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic,T5060P8 Dual-A (DFN5060-8 Dual-A).
- Mounting Position : Any.

Package outline



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

Parameter	Symbol	Ratings		Unit
		Die1	Die2	
Drain-source voltage	V _{DS}	30		V
Gate-source voltage	V _{GS}	±20		V
Continuous drain current ,V _{GS} @10V (Note1) (T_c=25°C) (T_c=100°C)	I _D	77	189	A
		48	120	
Continuous drain current ,V _{GS} @10V (Note1) (T_A=25°C) (T_A=70°C)		17.7	31	
		14	25	
Pulsed drain current (Note2)	I _{DM}	200	400	A
Avalanche current	I _{AS}	26	51	A
Single pulse avalanche energy (Note3)	E _{AS}	33.8	130	mJ
Power dissipation (Note4) T_c=25°C T_A=25°C	P _D	31.3	62.5	W
		1.67		
Thermal resistance Junction to ambient (Note1)	R _{θJA}	75		°C/W
Thermal resistance Junction to case (Note1)	R _{θJC}	4	2	°C/W
Operating Junction temperature	T _J	+150		°C
Storage temperature range	T _{STG}	-55 to +150		°C

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Electrical characteristics - Die1 (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	30			V
Drain-source leakage current	I _{DSS}	V _{DS} =24V, V _{GS} =0V, T _J =25°C			1	μA
		V _{DS} =24V, V _{GS} =0V, T _J =55°C			5	
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	1.2		2.2	V
Static drain-source on-resistance (Note 2)	R _{DS(ON)}	V _{GS} =10V, I _D =20A		2.7	3.6	mΩ
		V _{GS} =4.5V, I _D =15A		4	5.5	
Dynamic parameters						
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		1538		pF
Out capacitance	C _{oss}			749		
Reverse transfer capacitance	C _{rss}			120		
Gate resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz		1.4		Ω
Switching parameters						
Total gate charge	Q _g	V _{GS} =10V, V _{DS} =20V, I _D =20A		29		nC
Gate to source charge	Q _{gs}			4.6		
Gate to drain charge	Q _{gd}			6.8		
Turn-on delay time	t _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =1Ω, I _D =1A		12		ns
Rise time	t _r			10.5		
Turn-off delay time	t _{d(off)}			23		
Fall time	t _f			19		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 2)	V _{SD}	I _s =1A, V _{GS} =0V, T _J =25°C			1.2	V
Continuous source current (Note 1, 5)	I _s	V _G =V _D =0V, Force current			77	A

Note: 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

2.The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

3.The E_{AS} data shows maximum rating . The test condition is $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=26\text{A}$.

4.The power dissipation is limited by 150°C junction temperature.

5.The data is theoretically the same as I_S and I_{DM} , in real applications , should be limited by total power dissipation.

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Electrical characteristics - Die2 (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	30			V
Drain-source leakage current	I _{DSS}	V _{DS} =24V, V _{GS} =0V, T _J =25°C			1	μA
		V _{DS} =24V, V _{GS} =0V, T _J =55°C			5	
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	1.2		2.2	V
Static drain-source on-resistance (Note 2)	R _{DS(ON)}	V _{GS} =10V, I _D =20A		0.8	1.2	mΩ
		V _{GS} =4.5V, I _D =15A		1.2	2	
Dynamic parameters						
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		4887		pF
Out capacitance	C _{oss}			2389		
Reverse transfer capacitance	C _{rss}			293		
Gate resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz		1.2		Ω
Switching parameters						
Total gate charge	Q _g	V _{GS} =10V, V _{DS} =20V, I _D =20A		82		nC
Gate to source charge	Q _{gs}			13.1		
Gate to drain charge	Q _{gd}			17.6		
Turn-on delay time	t _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =1Ω, I _D =1A		19		ns
Rise time	t _r			14.5		
Turn-off delay time	t _{d(off)}			39		
Fall time	t _f			26		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 2)	V _{SD}	I _s =1A, V _{GS} =0V, T _J =25°C			1.2	V
Continuous source current (Note 1, 5)	I _s	V _G =V _D =0V, Force current			100	A

Note: 1.The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.

2.The data tested by pulsed , pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.

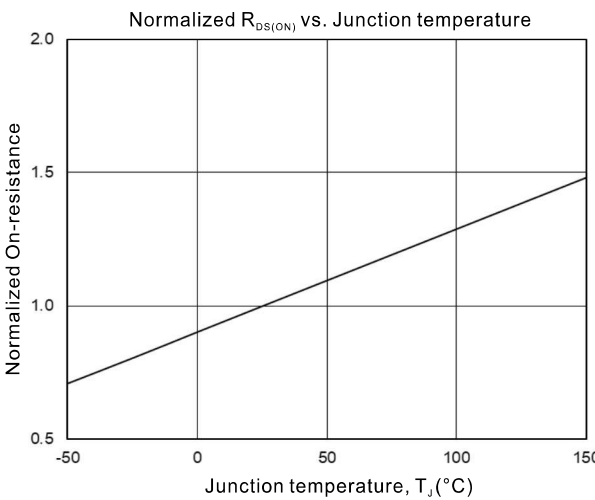
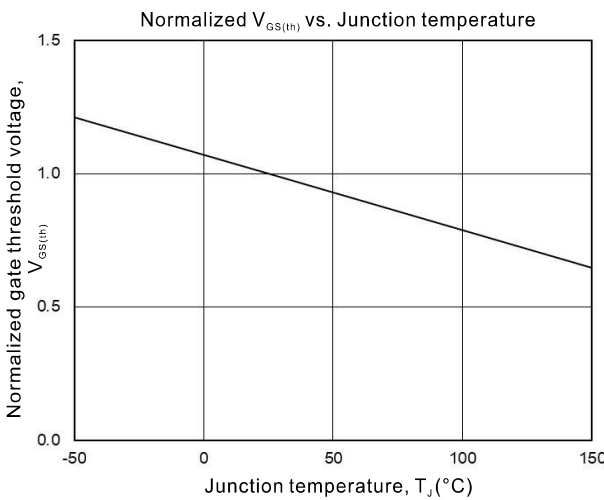
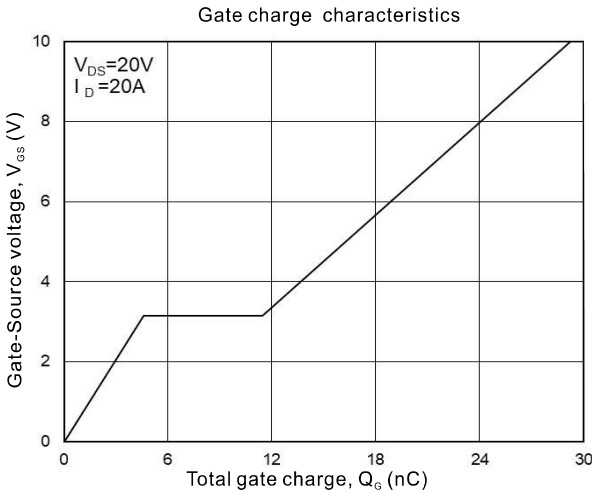
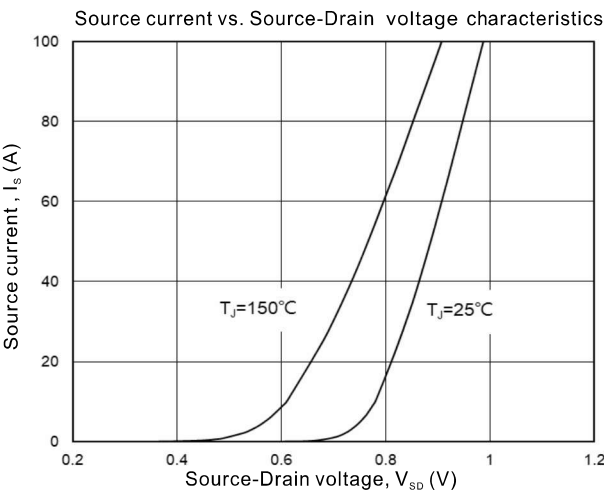
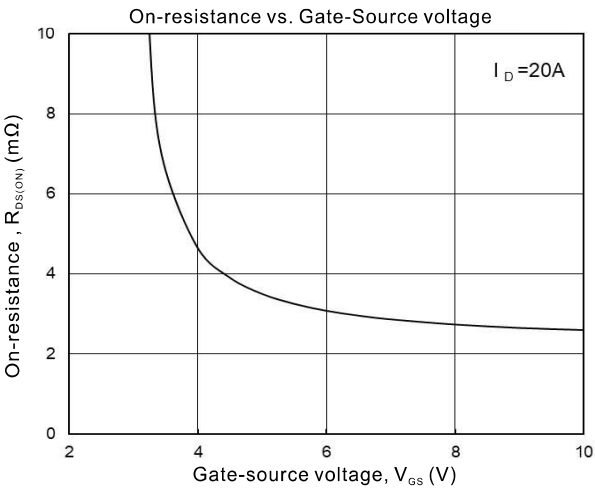
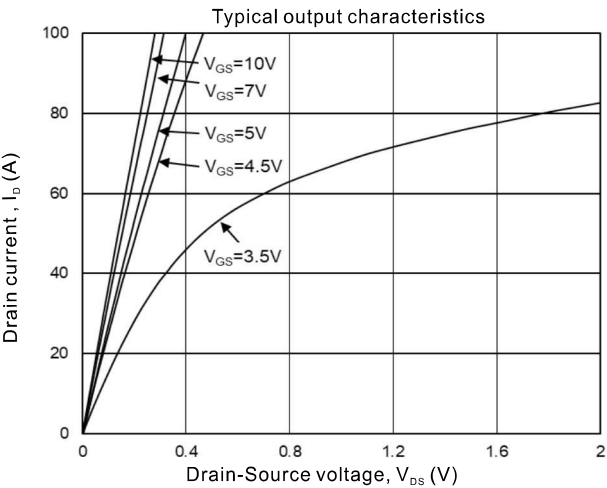
3.The E_{AS} data shows maximum rating . The test condition is $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=51\text{A}$.

4.The power dissipation is limited by 150°C junction temperature.

5.The data is theoretically the same as I_S and I_{DM} , in real applications , should be limited by total power dissipation.

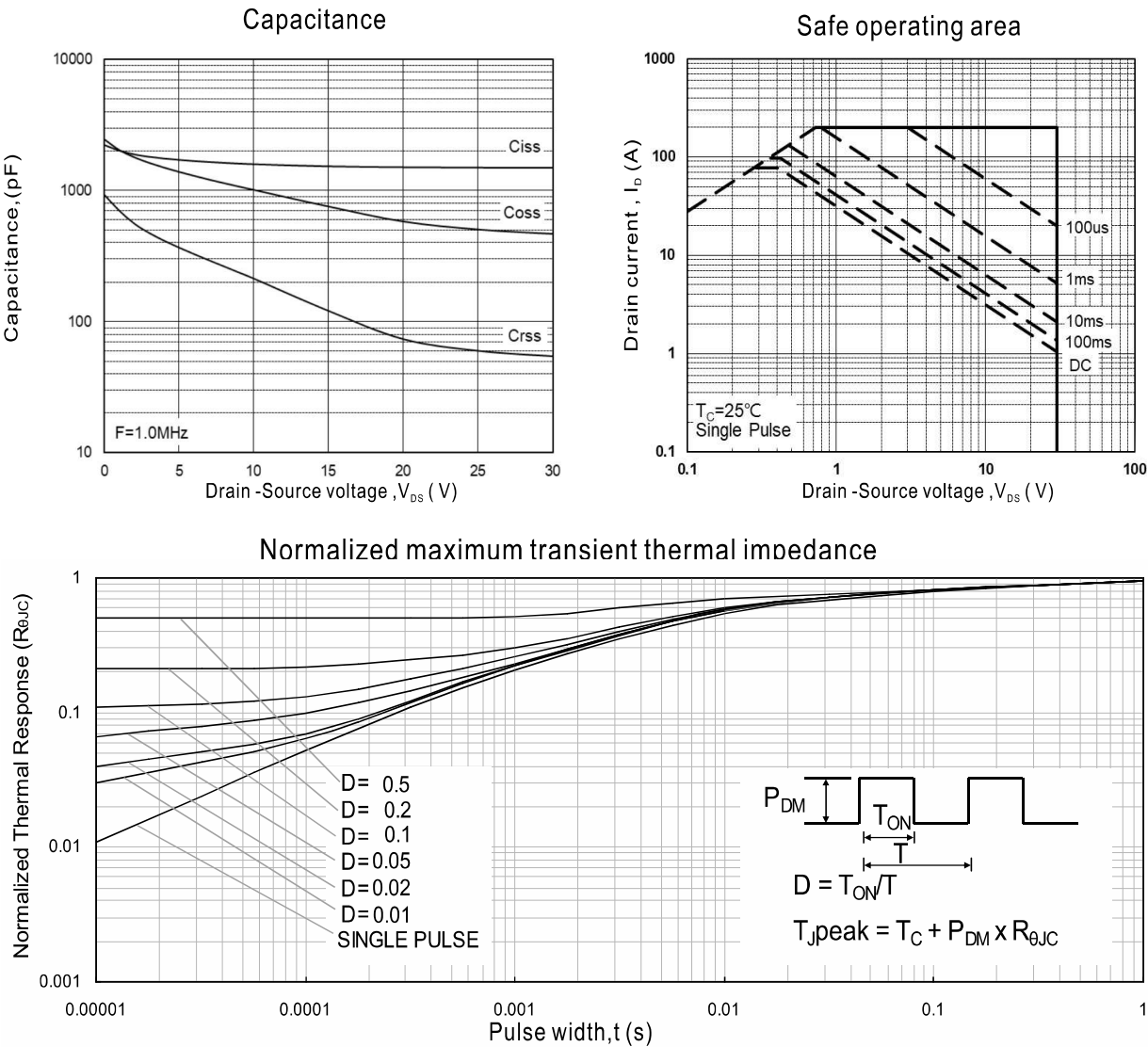
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Rating and characteristic curves - Die1



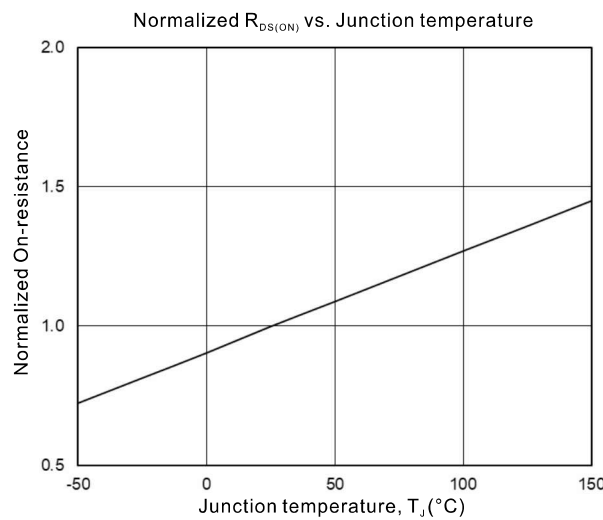
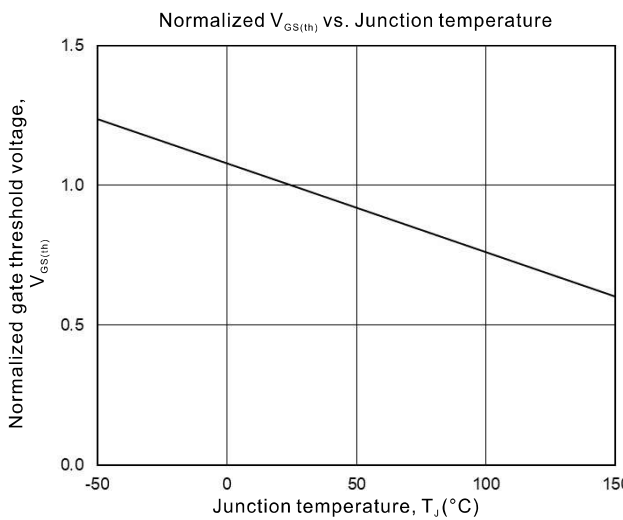
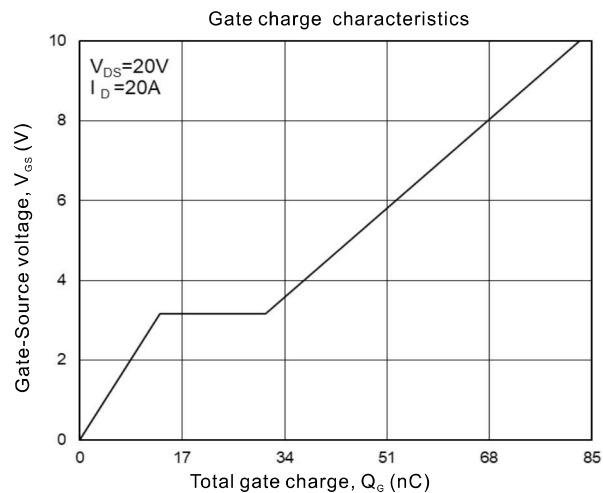
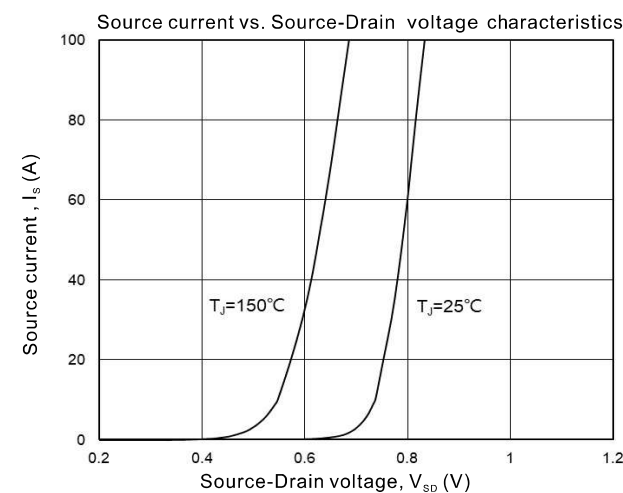
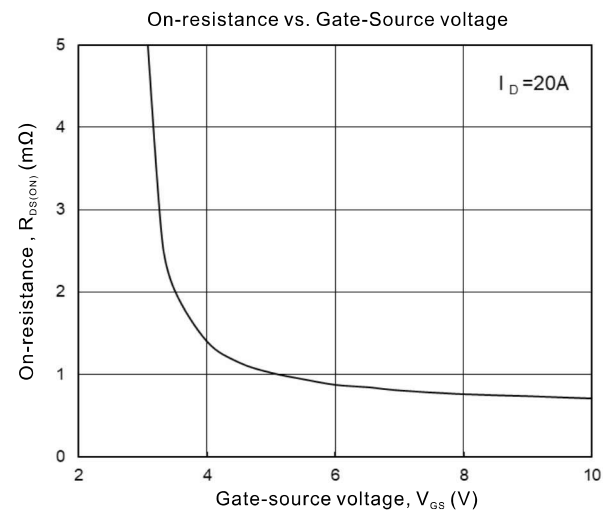
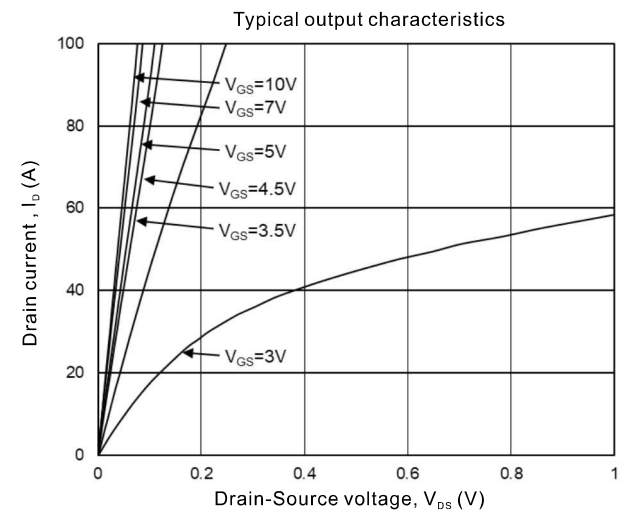
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Rating and characteristic curves - Die1



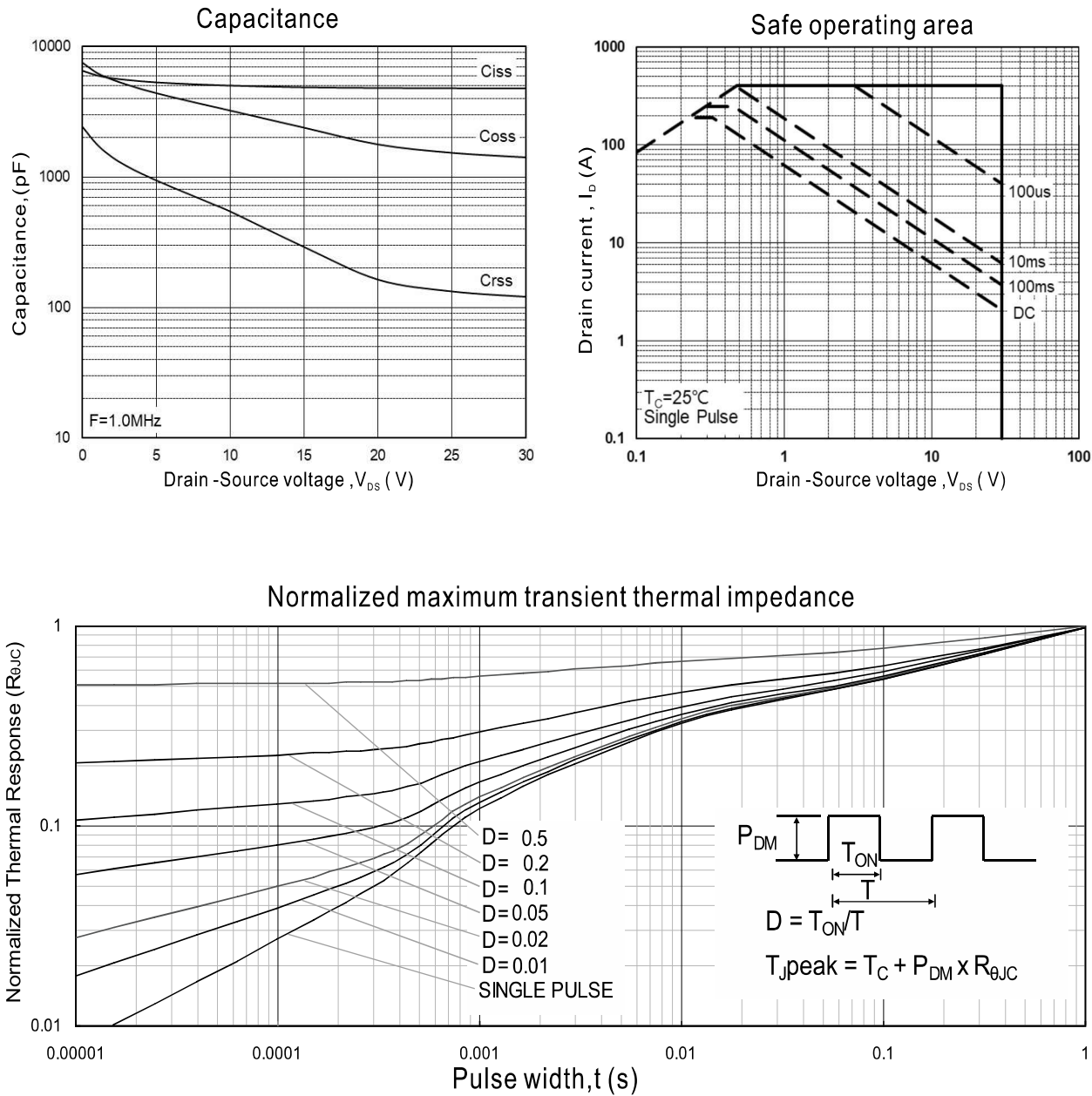
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Rating and characteristic curves - Die2



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Rating and characteristic curves - Die2



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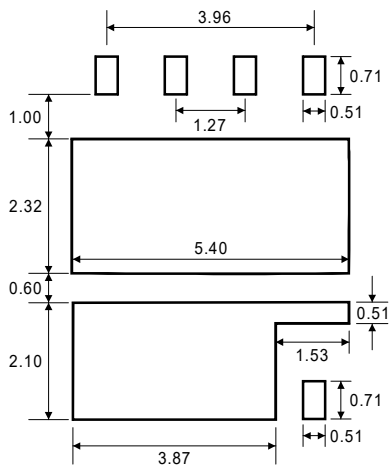
Pinning information

Pin	Simplified outline	Symbol
Pin 1 Gate 1 Pin 2, 3, 4 Drain1 Pin 5, 6, 7 Source1 / Drain2 Pin 8 Gate2 Pin 9 Source 2	Top view Bottom view	

Marking

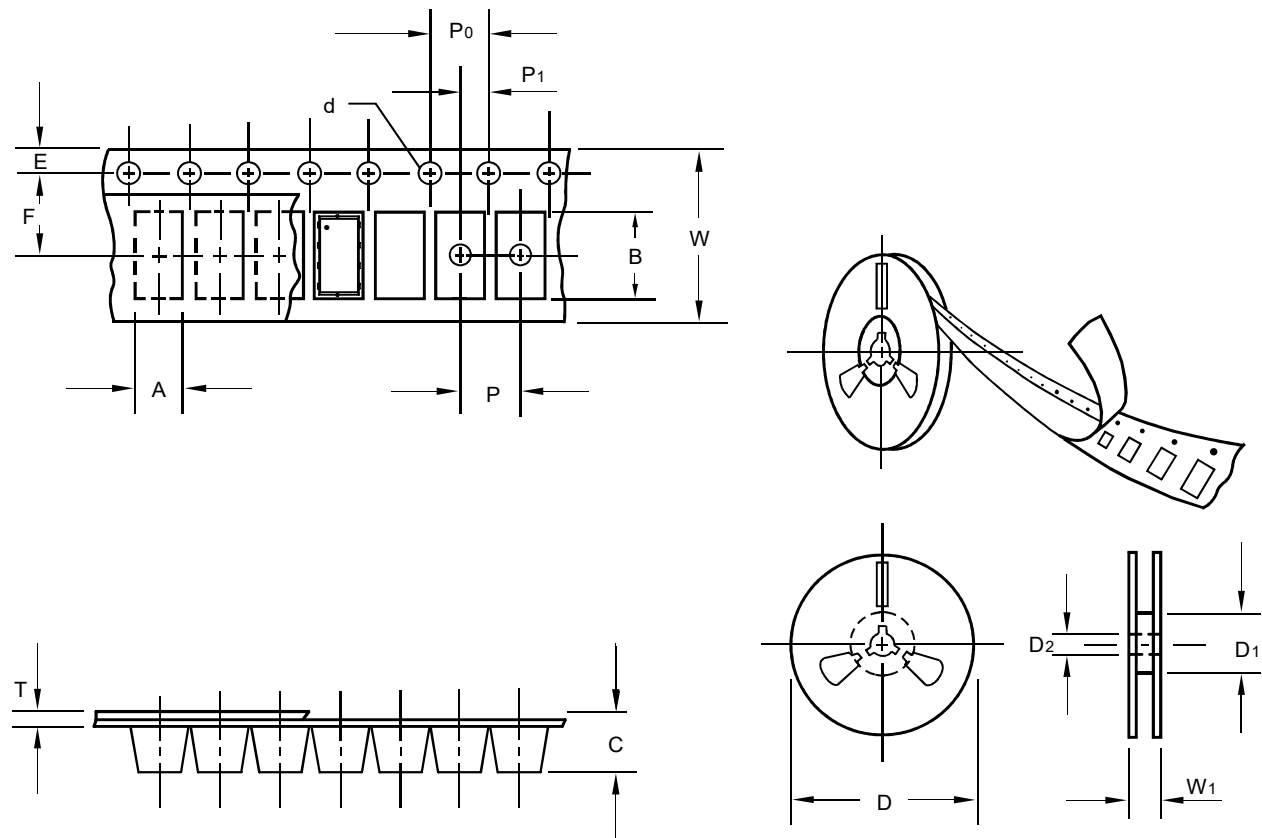
Type number	Marking code
FMOSATA3430	ATA3430

Suggested solder pad layout



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Packing information



unit:mm

Item	Symbol	Tolerance	T5060P8 Dual-A
Carrier width	A	0.1	6.50
Carrier length	B	0.1	5.30
Carrier depth	C	0.1	1.40
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	330.00
13" Reel inner diameter	D1	min	176.00
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	18.40

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

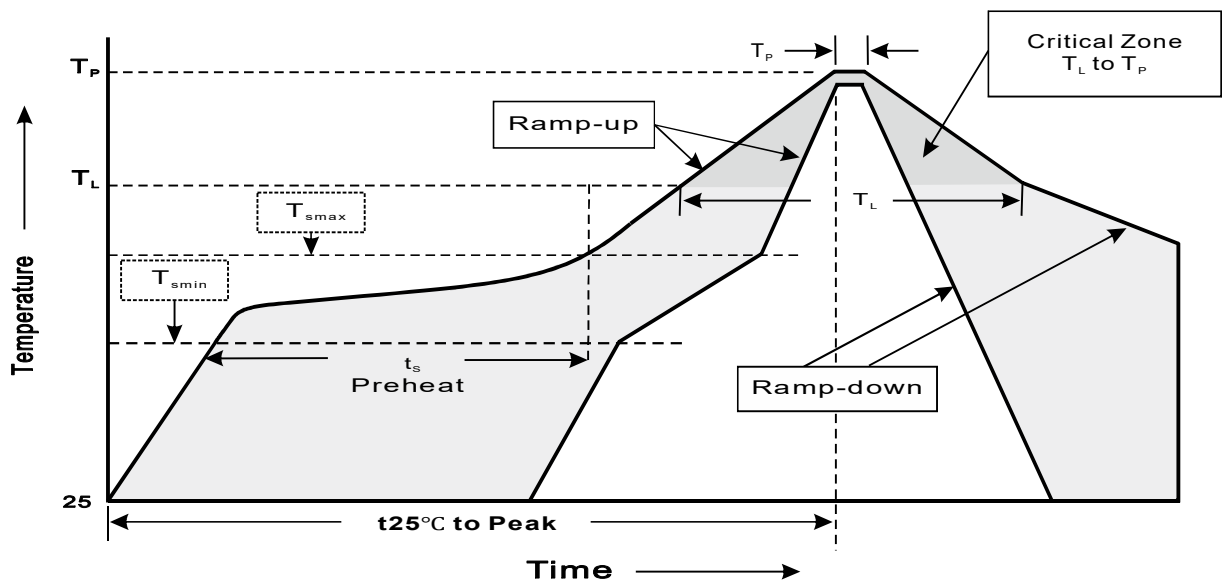
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Reel packing

Device	Outline	Device Package	Reel Size	Reel (pcs)
FMOSATA3430	Taping	T5060P8 Dual-A	13 inch	3,000

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