

FMOSTHM37N03-H

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FMOSTHM37N03-H

37A 30V N-Channel
Trench Fast Switching MOSFET

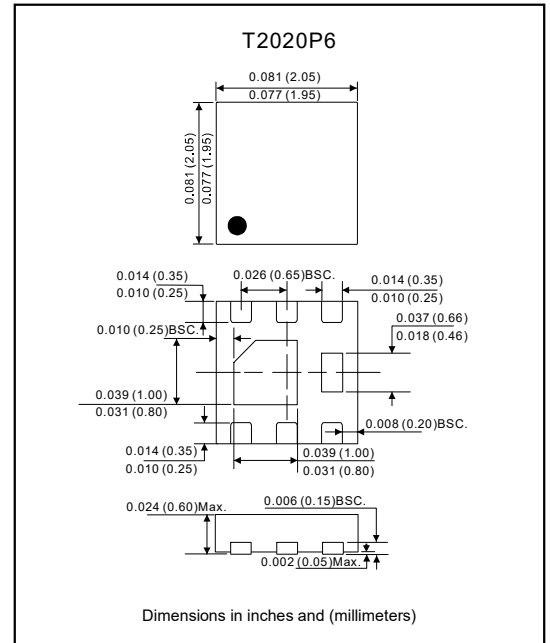
Features

- $V_{DS}=30V$, $I_D = 37A$.
- $R_{DS(ON)} \leq 12\text{ m}\Omega$ @ $V_{GS}=10V$, $I_D=15A$.
- $R_{DS(ON)} \leq 16.5\text{ m}\Omega$ @ $V_{GS}=4.5V$, $I_D=10A$.
- Super low gate charge.
- Excellent C_{dv}/dt effect decline.
- Advanced high cell density trench technology.
- 100% E_{AS} guaranteed.
- Lead-free parts meet RoHS requirements.
- Halogen-free (IEC61249-2-21).

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, T2020P6.
- Terminals:Solder plated,solderable per MIL-STD-750,Method 2026.
- Mounting Position : Any.

Package outline

Maximum ratings (At $T_A=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	V _{DS}	30	V
Gate-source voltage	V _{GS}	±20	
Continuous drain current (Note 1) T _c =25°C	I _D	37	A
		24	
Continuous drain current (Note 1) T _c =100°C		10	
		8	
Pulse drain current tested (Note 2)	I _{DM}	75	A
Single pulse avalanche energy (Note 3)	E _{AS}	24.2	mJ
Avalanche energy	I _{AS}	22	A
Total power dissipation (Note 4) T _A =25°C	P _D	26	W
		1.67	
Thermal resistance, junction to ambient (Note 1)	R _{θJA}	75	°C/W
Thermal resistance, junction to case (Note 1)	R _{θJC}	4.8	°C/W
Operating junction temperature	T _J	+150	°C
Storage temperature range	T _{STG}	-55 to +150	°C

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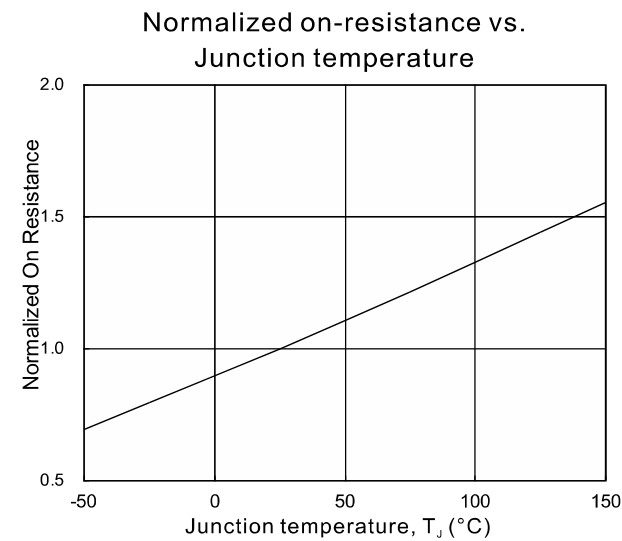
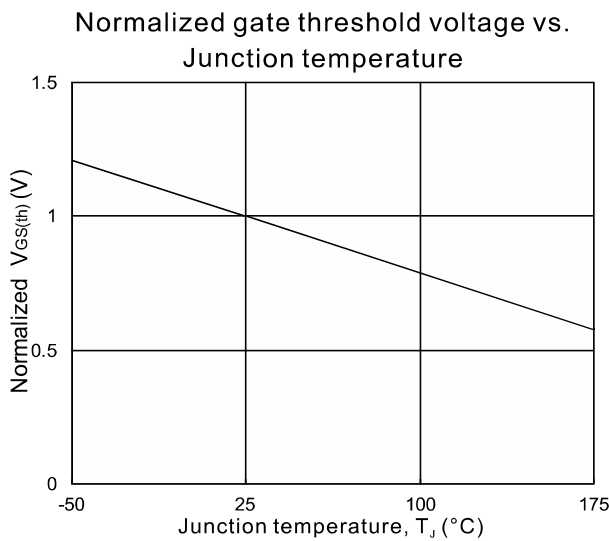
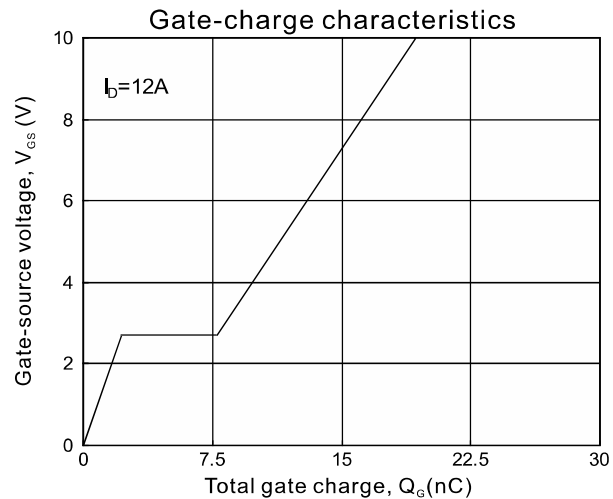
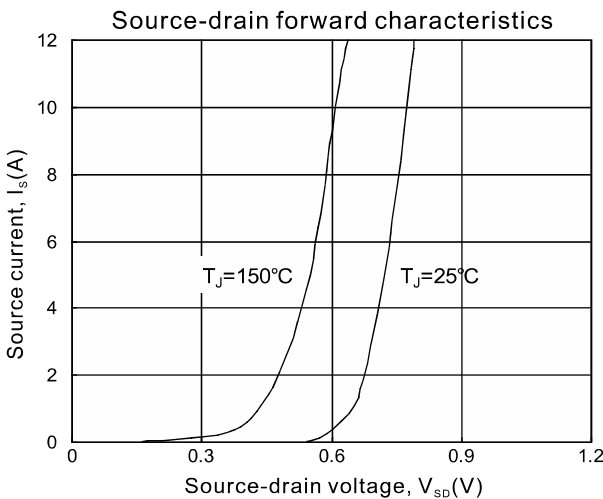
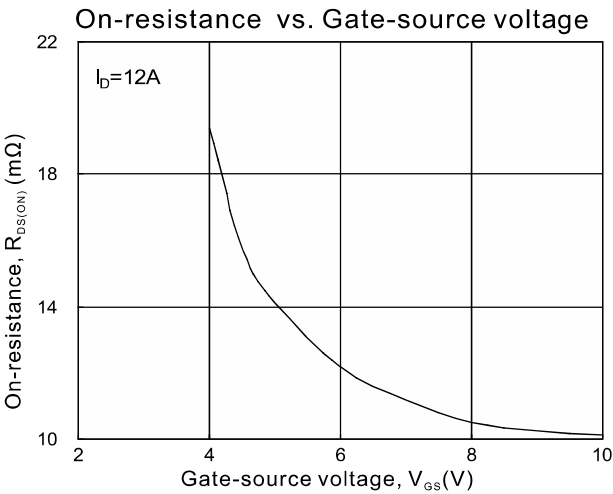
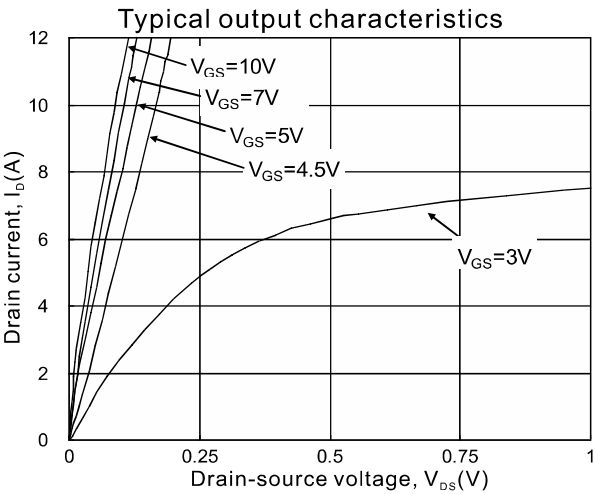
Electrical characteristics (At $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Off characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	I _D =250μA, V _{GS} =0V	30			V
Drain-source leakage current (note2)	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1	μA
		V _{DS} =30V, 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 _{DS} =V _{GS} , I _D =250μA	1.0		2.5	V
Static drain-source on-state resistance (Note 2)	R _{DS(ON)}	V _{GS} =10V, I _D =15A		9	12	mΩ
		V _{GS} =4.5V, I _D =10A		12	16.5	
Forward transconductance	g _{FS}	V _{DS} =5V, I _D =15A		24.4		S
Dynamic parameters						
Input capacitance	C _{iss}	V _{GS} =0V, V _{DS} =15V, f=1.0MHz		896		pF
Out capacitance	C _{oss}			126		
Reverse transfer capacitance	C _{rss}			108		
Gate resistance	R _g	V _{DS} =0V, V _{GS} =0V, f=1.0MHz		1.8		Ω
Switching parameters						
Total gate charge (4.5V)	Q _g	V _{GS} =4.5V, V _{DS} =15V, I _D =12A		9.82		nC
Gate to source charge	Q _{gs}			2.24		
Gate to drain charge	Q _{gd}			5.54		
Turn-on delay time	t _{d(on)}	V _{DD} =15V, V _{GS} =10V, R _G =1.5Ω, I _D =20A		6.4		ns
Rise time	t _r			39		
Turn-off delay time	t _{d(off)}			21		
Fall time	t _f			4.7		
Source-drain diode ratings and characteristics						
Drain-source diode forward voltage (Note 2)	V _{SD}	I _S =1A, V _{GS} =0V			1.0	V
Diode continuous current (Note 1,5)	I _S	V _G =V _D =0V, force current			37	A
Pulsed source current (Note 2,5)	I _{SM}				75	A

Note : 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, $t \leq 10\text{s}$.
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 $V_{DD}=25\text{V}$, $V_{GS}=10\text{V}$, $L=0.1\text{mH}$, $I_{AS}=22\text{A}$.
4. The power dissipation is limited by 175°C junction temperature.
5. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

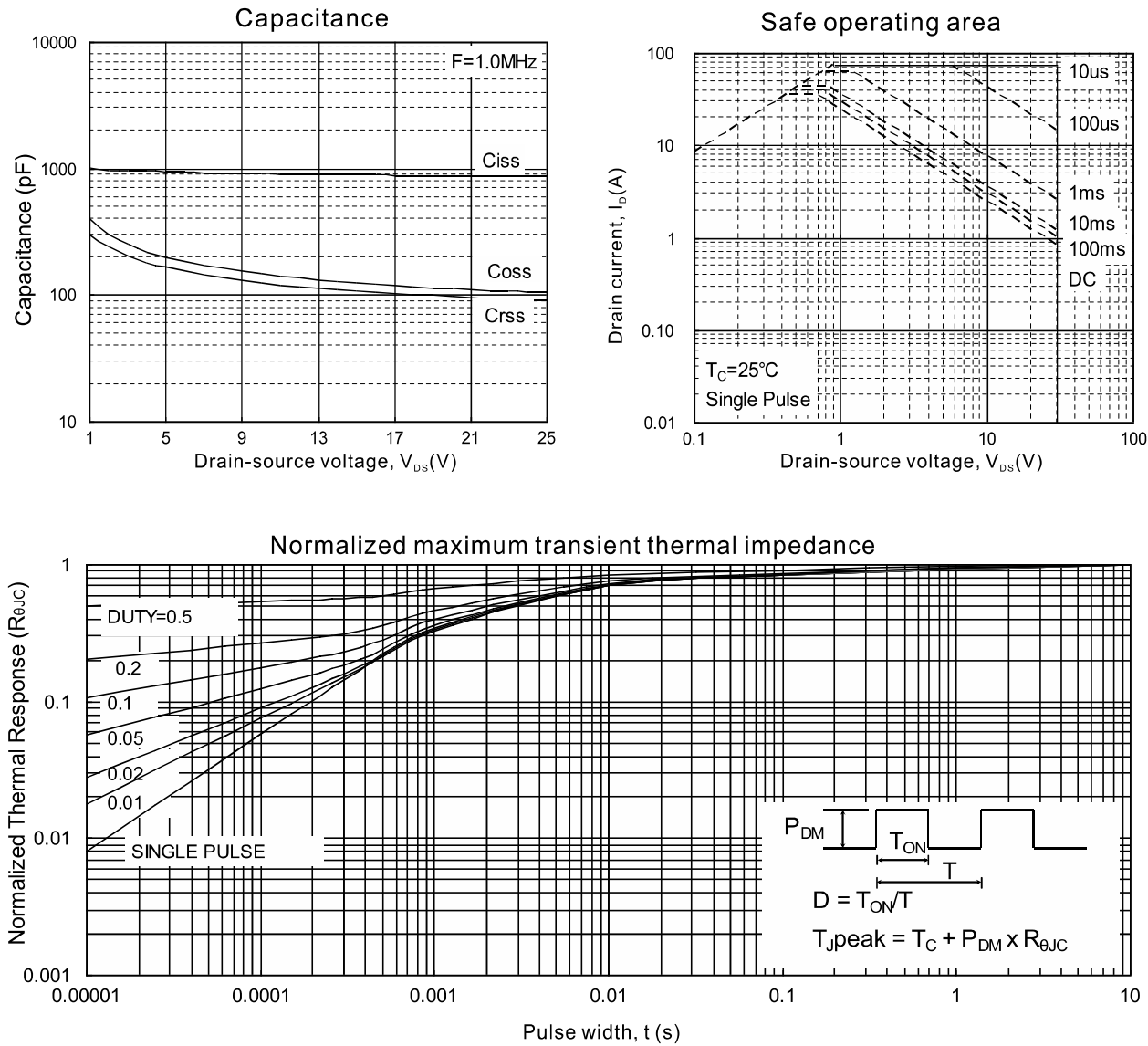
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Rating and characteristic curves



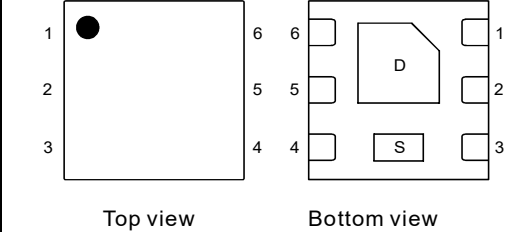
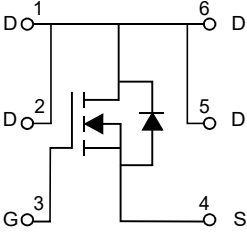
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Rating and characteristic curves



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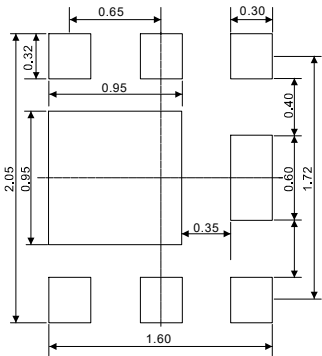
Pinning information

Pin	Simplified outline	Symbol
Pin1,2 Drain Pin3 Gate Pin4 Source Pin5,6 Drain	 Top view Bottom view	

Marking

Type Number	Marking code
FMOSTHM37N03-H	M37

Suggested solder pad layout



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

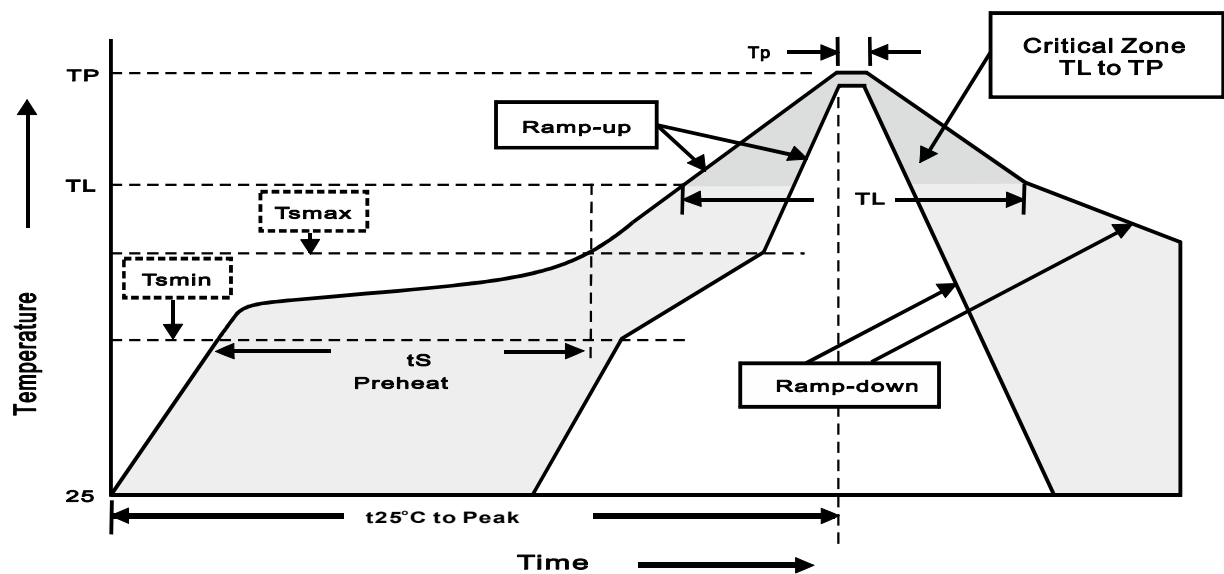
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Reel packing

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)
T2020P6	7"	3,000	4	30,000	183*123*183	178	382*356*392	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 _{smmin}) -Temperature Max(T _{smmax}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{smmax} to T _L -Ramp-upRate	<3°C/sec
Time maintained above: -Temperature(T _L) -Time(t _L)	217°C 60~260sec
Peak Temperature(T _P)	255°C-0/+5°C
Time within 5°C of actual Peak Temperature(t _P)	10~30sec
Ramp-down Rate	<3°C/sec
Time 25°C to Peak Temperature	<6minutes