FMOSM3419

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-6A -20V P-Channel Enhancement Mode Power MOSFET

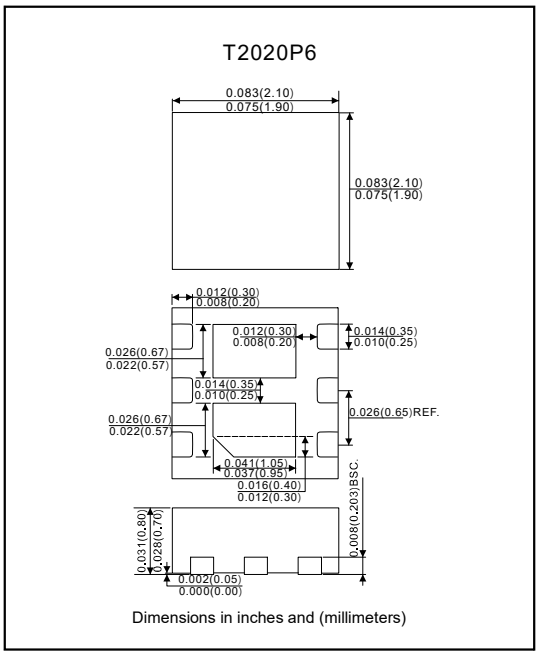
Features

- $-V_{DS}$=20V, $-I_D$ =6A.
- $R_{DS(ON)}$ ≤ 24mΩ @$-V_{GS}$ = 4.5V, $-I_D$=4.8A.
- $R_{DS(ON)}$ ≤ 28mΩ @$-V_{GS}$ = 2.5V, $-I_D$=3.5A.
- $R_{DS(ON)}$ ≤ 40mΩ @$-V_{GS}$ = 1.8V, $-I_D$=1.2A.
- Super high dense cell trench design for low on-resistance.
- Rugged and reliable.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOSM3419-H.

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°C unless otherwise noted)

Parameter	Symbol	Ratings	Unit
Drain-source voltage	$-V_{DS}$	20	V
Gate-source voltage	V_{GS}	±8	V
Continuous drain current (Note 1) (T_A=25°C)	$-I_D$	6	A
Pulsed drain current (Note 2)	$-I_{DM}$	24	A
Power dissipation (Note 1)	P_D	1.25	W
Thermal resistance junction to ambient (Note 1)	$R_{\theta JA}$	62.5	°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°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	20			V
Drain-source leakage current	$-I_{DSS}$	$-V_{DS}$=30V, V_{GS}=0V			1	μA
Gate-source leakage current	I_{GSS}	V_{GS}=±12V, V_{DS}=0V			±100	nA
On characteristics (Note 4)						
Gate threshold voltage	$-V_{GS(TH)}$	V_{DS}=V_{GS}, $-I_D$=250μA	0.4	0.55	0.67	V
Static drain-source on-state resistance	$R_{DS(ON)}$	$-V_{GS}$=4.5V, $-I_D$=4.8A		18	24	mΩ
		$-V_{GS}$=2.5V, $-I_D$=3.5A		23	28	
		$-V_{GS}$=1.8V, $-I_D$=1.2A		31	40	
Forward transconductance	g_{FS}	$-V_{DS}$=10V, $-I_D$=4A		4		S
Dynamic parameters (Note 4)						
Input capacitance	C_{iss}	V_{GS}=0V, $-V_{DS}$=15V, f=1.0MHz		875		pF
Out capacitance	C_{oss}			238		
Reverse transfer capacitance	C_{rss}			183		
Switching parameters (Note 4)						
Total gate charge	Q_g	$-V_{GS}$= 4.5V, $-V_{DS}$=15V, $-I_D$=4A		7.5	10.5	nC
Gate to source charge	Q_{gs}			3.2	48	
Gate to drain charge	Q_{gd}			1.7	3.1	
Turn-on delay time	$t_{d(on)}$	$-V_{DD}$=15V, $-I_D$=4A, $-V_{GEN}$=10V,R_G=6Ω		11	28	ns
Rise time	t_r			6	18	
Turn-off delay time	$t_{d(off)}$			32	75	
Fall time	t_f			8	18	
Drain-source diode characteristics (Note 3)						
Drain-source diode forward current (Note3)	$-I_S$				4	A
Drain-source diode forward voltage (Note4)	$-V_{SD}$	I_S=1A, V_{GS}=0V		0.7	1.3	V

Note:1.Surface mounted on FR4 board, t ≤ 10sec.

2.Pulse width limited by maximum junction temperature.

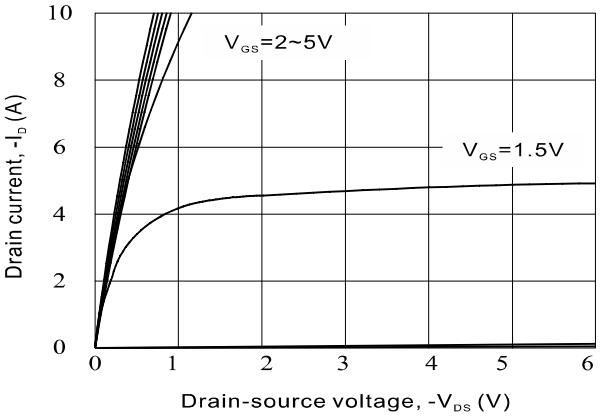
3.Pulse test pulse width ≤ 300μs, duty cycle ≤ 2%.

4.Guaranteed by design, not subject to production testing.

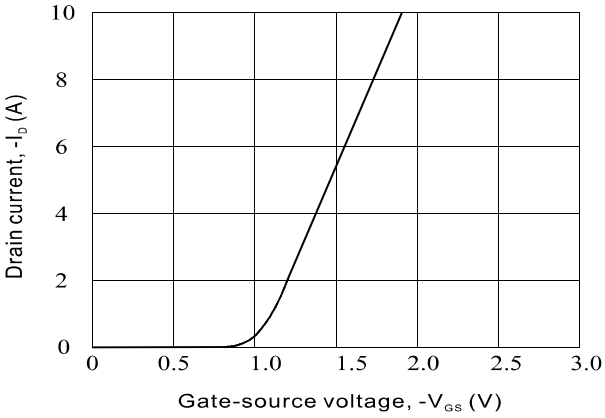
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Rating and characteristic curves

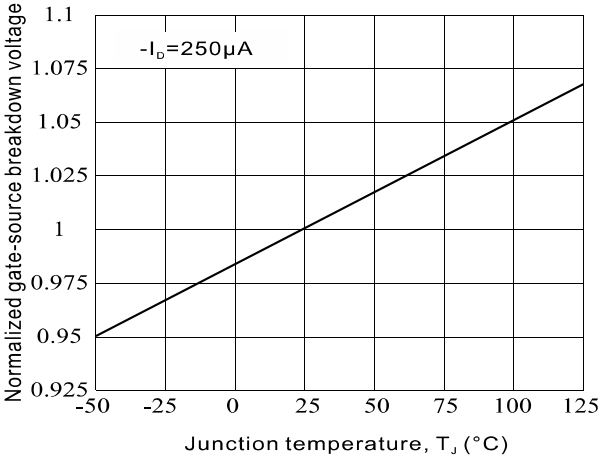
Output characteristics



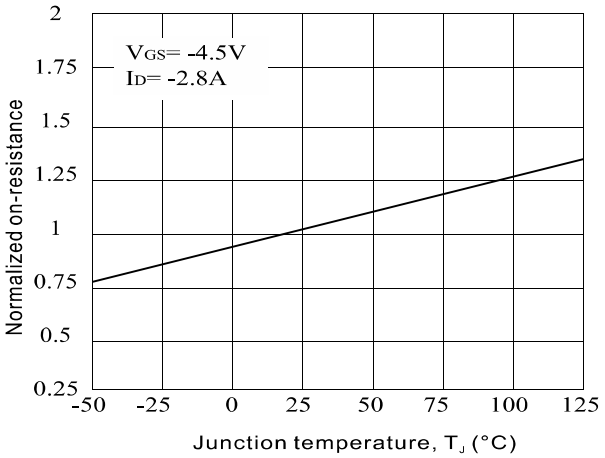
Transfer characteristics



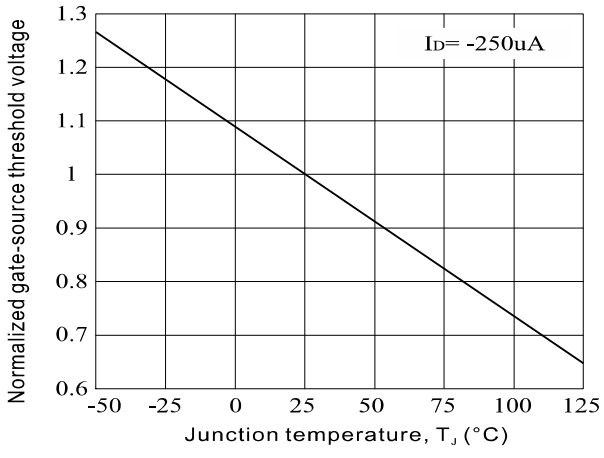
Breakdown voltage variation with temperature



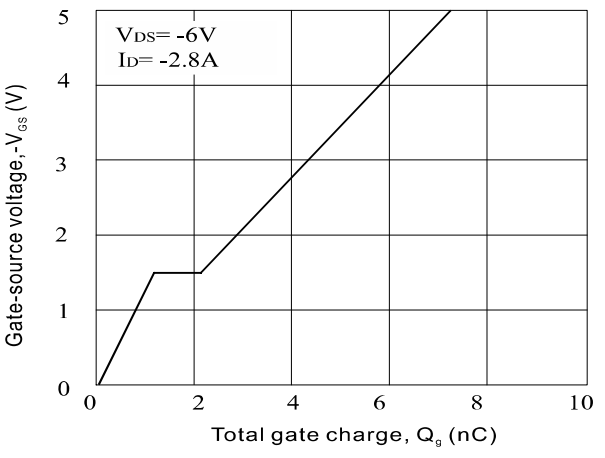
On-resistance variation with temperature



Gate threshold variation with temperature



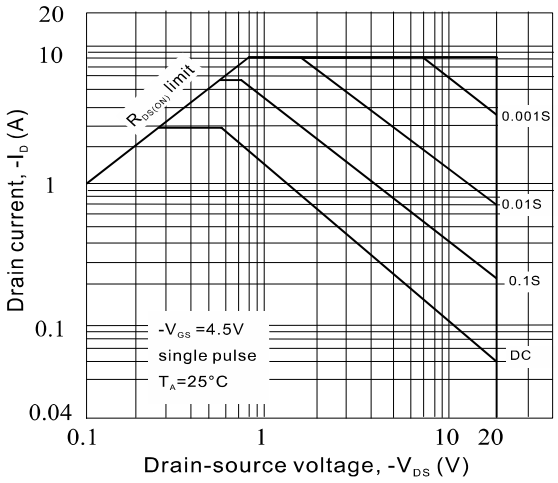
Gate charge



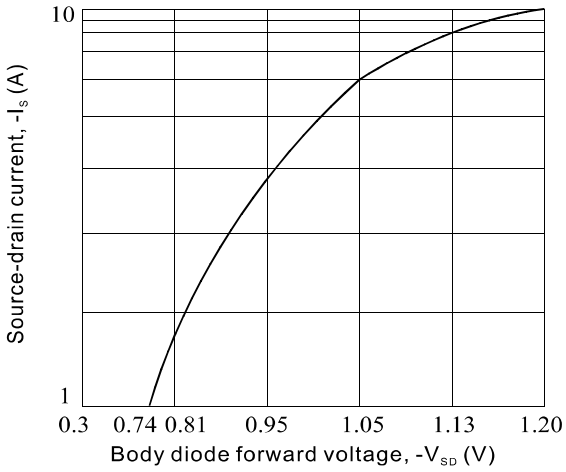
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Rating and characteristic curves

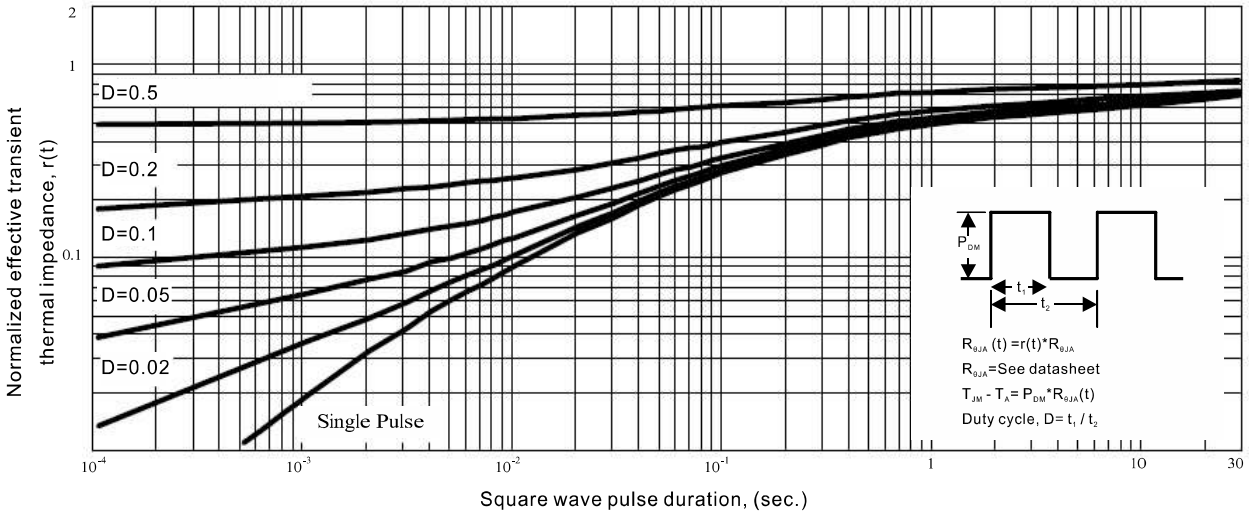
Maximum safe operating area



Body diode forward voltage variation with source current

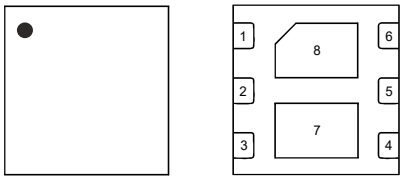
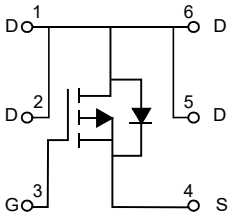


Normalized thermal transient impedance curve



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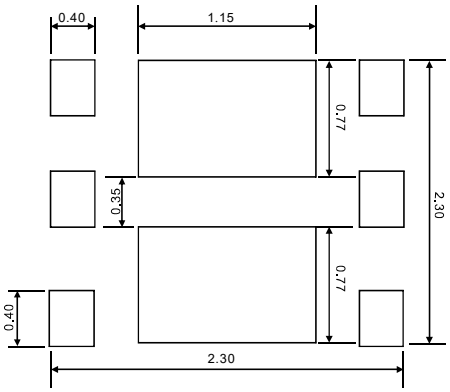
Pinning information

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

Marking

Type number	Marking code
FMOSM3419	3419

Suggested solder pad layout



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

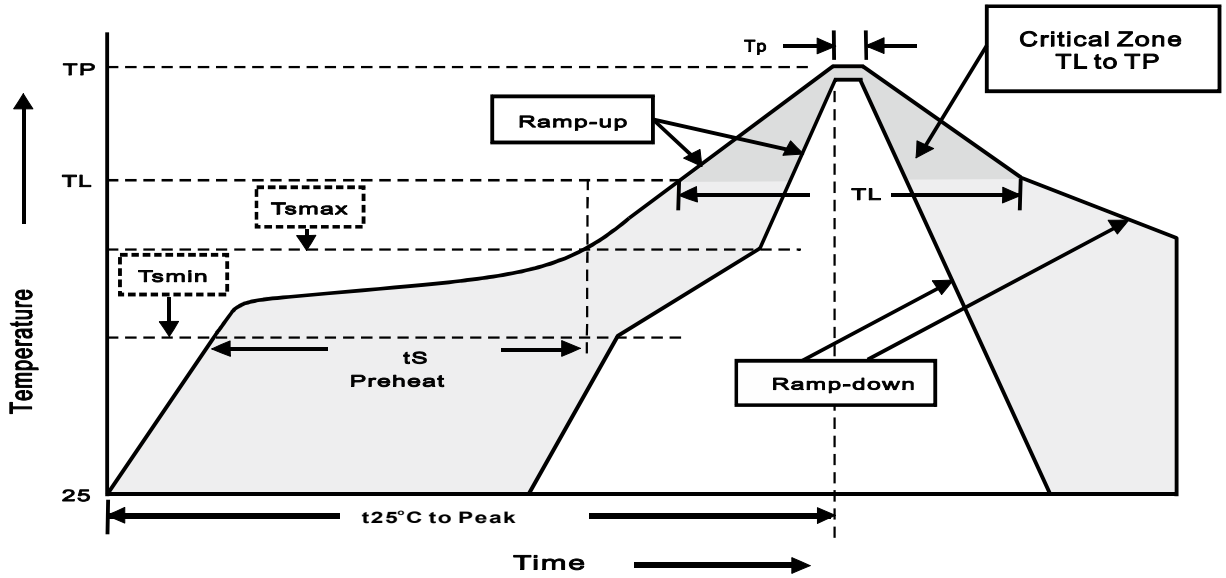
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Reel packing

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	210*210*202	178	440*440*225	120,000

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(Tsmin) -Temperature Max(Tsmax) -Time(min to max)(t_s)	 150°C 200°C 60~120sec
Tsmax 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