

FMOS6107

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FMOS6107

-1.7A -60V P-Channel Enhancement Mode Power MOSFET

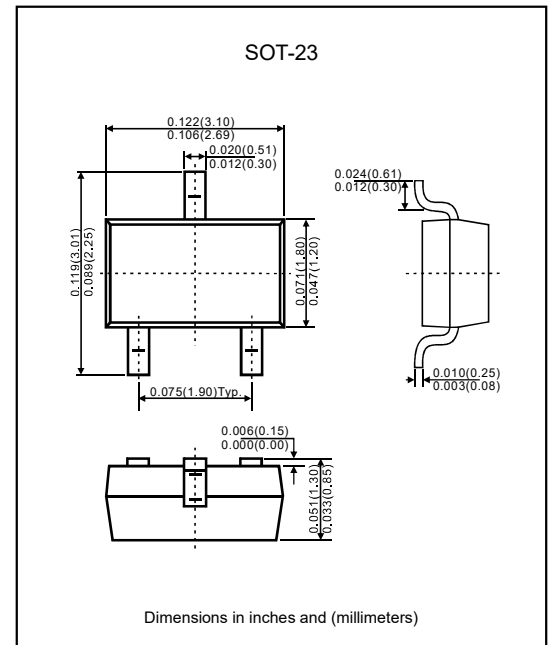
Features

- $-V_{DS}=60V$, $-I_D=1.7A$.
- $R_{DS(on)} \leq 180\text{ m}\Omega$ @ $-V_{GS}=10V$, $-I_D=1.5A$.
- $R_{DS(on)} \leq 266\text{ m}\Omega$ @ $-V_{GS}=4.5V$, $-I_D=1A$.
- 100% E_{AS} guaranteed.
- Super low gate charge.
- Excellent CdV/dt effect decline.
- Advanced high cell density trench technology.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen-free part, ex.FMOS6107-H.

Mechanical data

- Epoxy:UL94-V0 rated flame retardant.
- Case : Molded plastic, SOT-23.

Package outline



Maximum Ratings (At $T_A=25^\circ\text{C}$ Unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain source voltage	$-V_{DS}$	60	V
Gate source voltage	V_{GS}	± 20	V
Drain current continuous (Note 1)	$-I_D$	$(V_{GS}=-10V, T_A=25^\circ\text{C})$ 1.7	A
		$(V_{GS}=-10V, T_A=70^\circ\text{C})$ 1.4	
Pulsed drain current (Note 2)	$-I_{DM}$	7	A
Power dissipation (Note 3)	P_D	1	W
Thermal resistance, junction to ambient (Note 1)	$R_{\theta JA}$	125	$^\circ\text{C/W}$
Thermal resistance, junction to case (Note 1)	$R_{\theta JC}$	80	$^\circ\text{C/W}$
Operating junction temperature	T_J	+150	$^\circ\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^\circ\text{C}$

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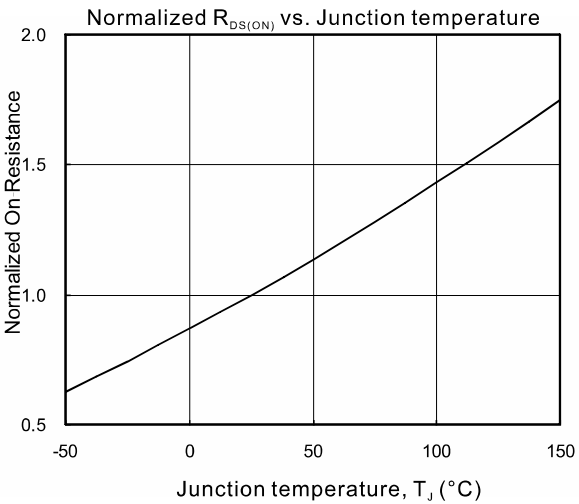
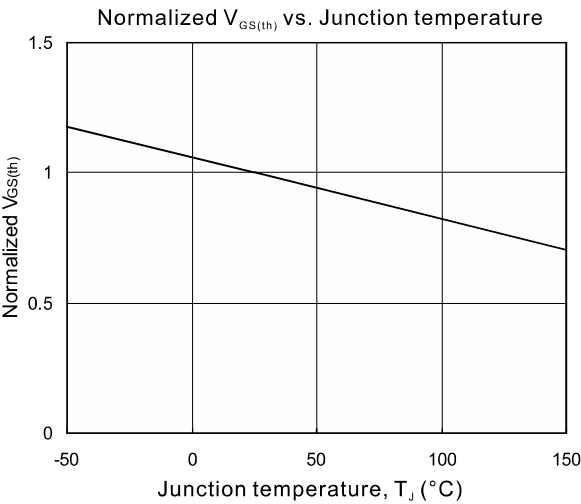
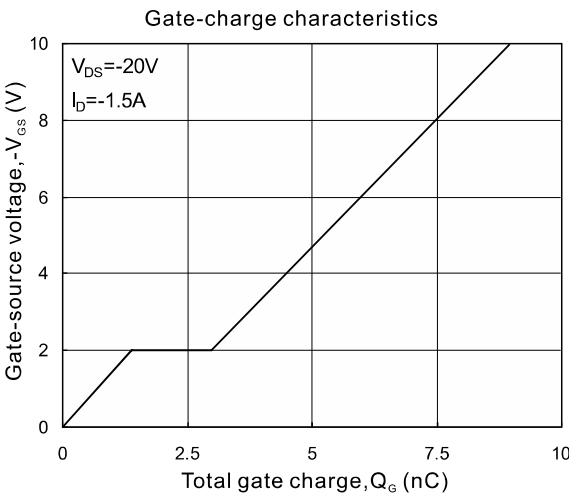
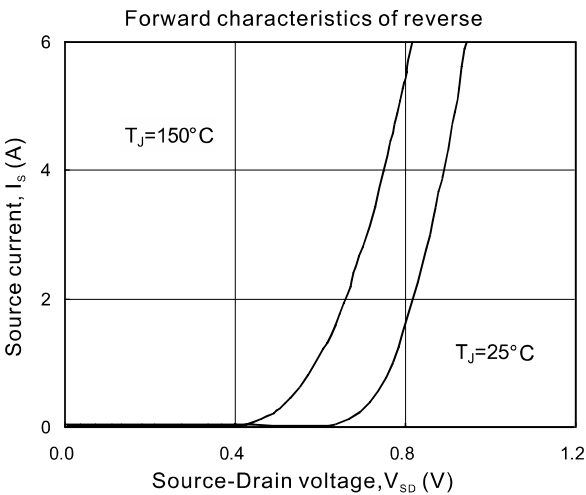
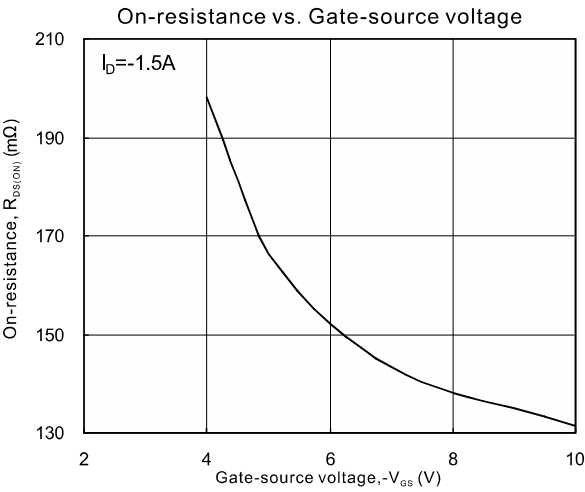
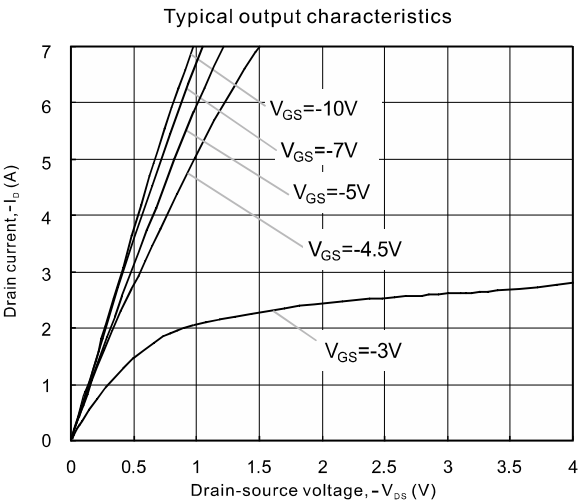
Electrical characteristics (At $T_J=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Static parameters						
Drain-source breakdown voltage	-BV _{DSS}	-I _D =250μA, V _{GS} =0V	60			V
BV _{DSS} Temperature Coefficient	ΔBV _{DSS} /ΔT _J	Reference to 25°C , -I _D =1mA		-0.021		V/°C
Drain-source leakage current	-I _{DSS}	-V _{DS} =48V , V _{GS} =0V , T _J =25°C			1	μA
		-V _{DS} =48V , 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		2.5	V
V _{GS(th)} Temperature coefficient	ΔV _{GS(TH)}			4.08		mV/°C
Static drain-source on-state resistance (note 2)	R _{DS(ON)}	-V _{GS} =10V, -I _D =1.5A			180	mΩ
		-V _{GS} =4.5V, -I _D =1A			266	
Forward transconductance	g _{FS}	-V _{DS} =5V, -I _D =1.5A		5.9		S
Dynamic parameters						
Input capacitance	C _{iss}	V _{GS} =0V, -V _{DS} =15V, f=1.0MHz		531		pF
Out capacitance	C _{oss}			59		
Reverse transfer capacitance	C _{rss}			38		
Switching parameters						
Total gate charge (-4.5V)	Q _g	-V _{GS} =4.5V,-V _{DS} =20V,-I _D =1.5A		4.6		nC
Gate to source charge	Q _{gs}			1.4		
Gate to drain charge	Q _{gd}			1.62		
Turn-on delay time	t _{d(on)}	-V _{DS} =15V, -V _{GS} =10V, R _G =3.3Ω, -I _D =1A		17.4		ns
Rise time	t _r			5.4		
Turn-off delay time	t _{d(off)}			37.2		
Fall time	t _f			2.4		
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
Diode continuous current (Note 1,4)	-I _S	V _G =V _D =0V , Force current			1.7	A
Pulsed Source Current (Note 2,4)	-I _{SM}				7	A

Note: 1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.2. The data tested by pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.3. The power dissipation is limited by 150°C junction temperature.4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

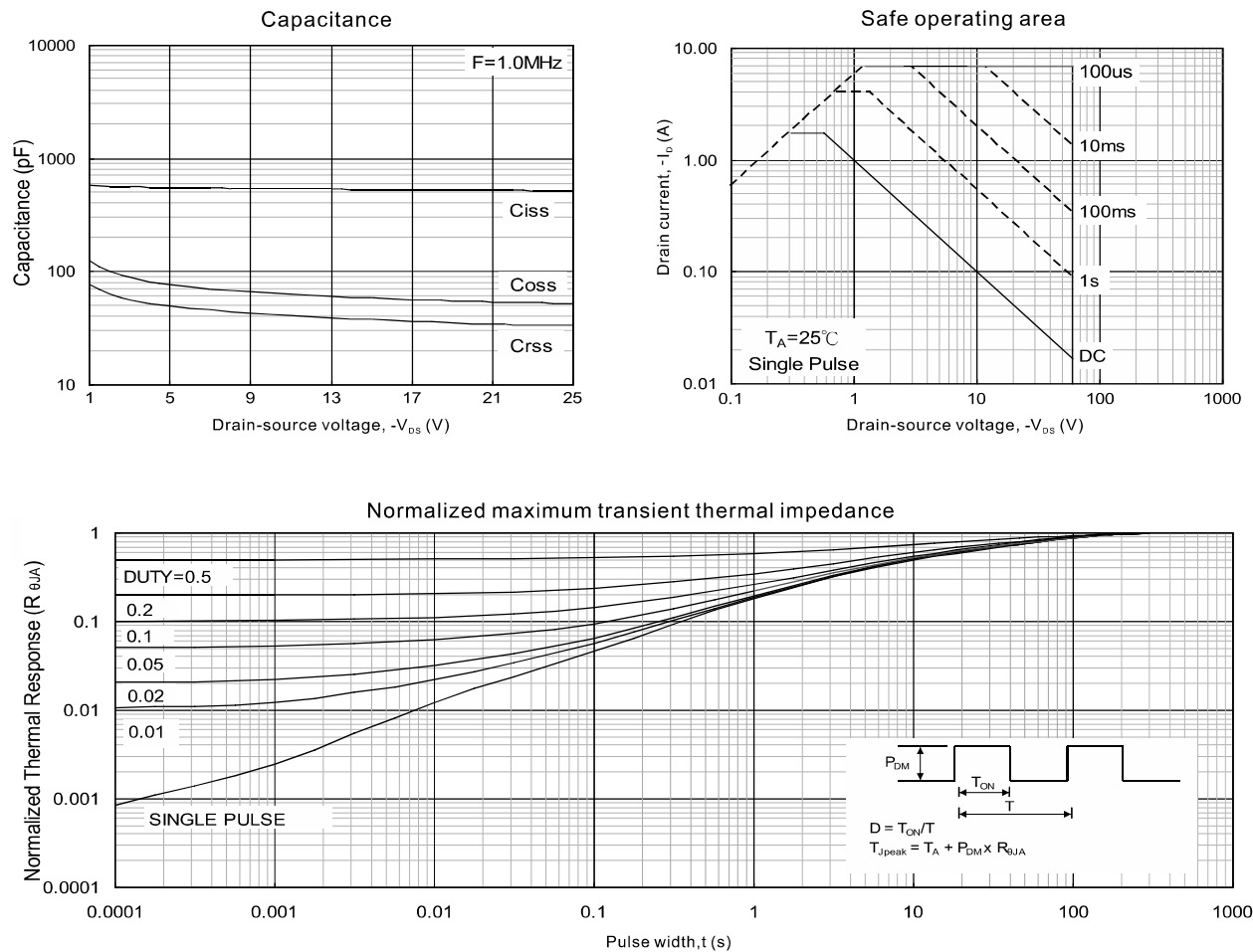
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Rating and characteristic curves



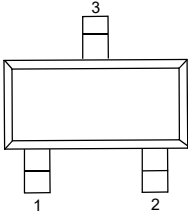
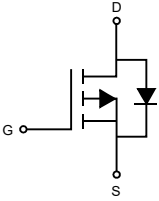
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Rating and characteristic curves



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Pinning information

Pin	Simplified outline	Symbol
Pin1 Gate Pin2 Source Pin3 Drain		

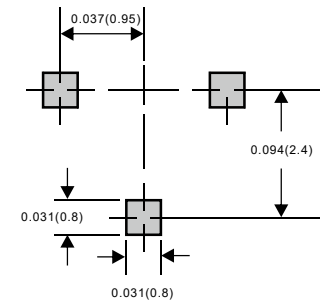
Marking

Type Number	Marking code
FMOS6107	A4YW ⚡

* "A4":Product code.
"YW ":Wafer lot code.
Y:Year
W:Week
"S":Sequence.
"X": Assy.code.

Suggested solder pad layout

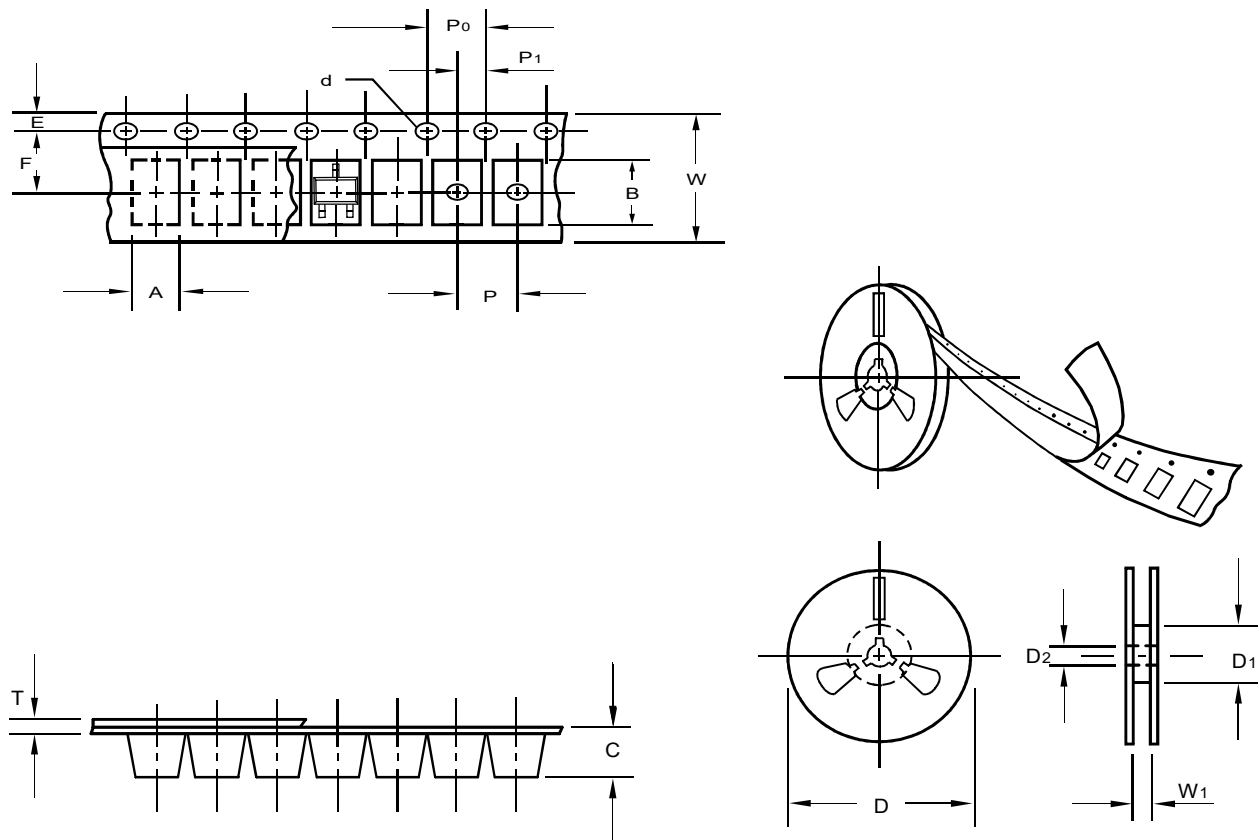
SOT-23



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.2	3.15
Carrier length	B	0.2	3.25
Carrier depth	C	0.2	1.47
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D1	min	55.0
Feed hole diameter	D2	0.5	13.00
Sprocket hole position	E	0.1	1.75
Punch hole position	F	0.1	3.50
Punch hole pitch	P	0.1	4.00
Sprocket hole pitch	P0	0.1	4.00
Embossment center	P1	0.1	2.00
Overall tape thickness	T	0.1	0.25
Tape width	W	0.3	8.00
Reel width	W1	1.0	8.4

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

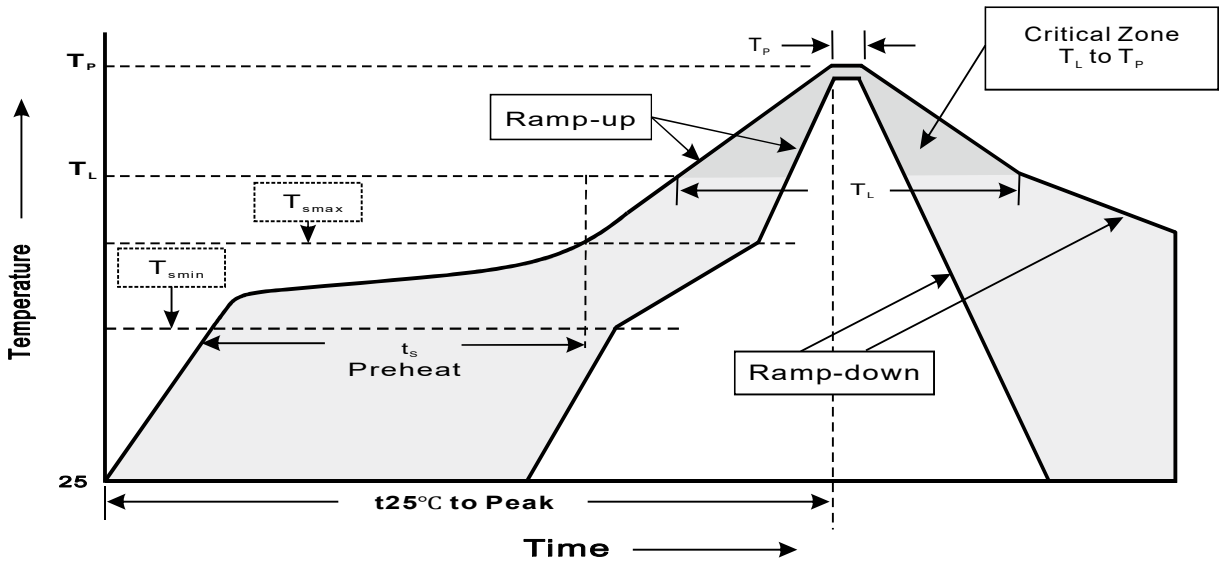
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Reel packing

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)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	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_{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