FMOS2321

List

FMOS2321

20V P-Channel Enhancement Mode Power MOSFET

Features

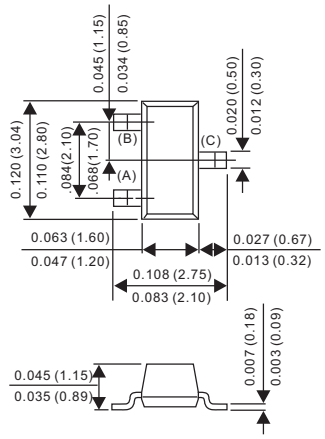
- TrenchFET power MOSFET
- Lead-free parts meet RoHS requirments
- Suffix "-H" dinicates Halogen-free part, ex.FMOS2321-H.

Application

- PA Switch
- Load Switch

Package outline

SOT-23



Dimensions in inches and (millimeters)

Mechanical data

- Epoxy:UL94-V0 rated flame retardant
- Case : Molded plastic, SOT-23
- Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
- Mounting Position : Any
- Weight : Approximated 0.008 gram

Maximum ratings (AT T_A=25°C unless otherwise noted)

PARAMETER	Symbol	MIN.	TYP.	MAX.	UNIT
Drain-source voltage	V_{DS}			-20	V
Continuous drain current	I_D			-2.9	A
Pulsed drain current	I_{DM}			-12	A
Continuous source-drain diode current	I_S			-0.59	A
Gate-source voltage	V_{GS}			±12	V
Maximum power dissipation	P_D			350	mW
Thermal resistance junction to ambient	$R_{\theta JA}$		357		°C/W
Operation junction temperature range	T_J	-55		+150	°C
Storage temperature range	T_{STG}	-55		+150	°C

FMOS2321

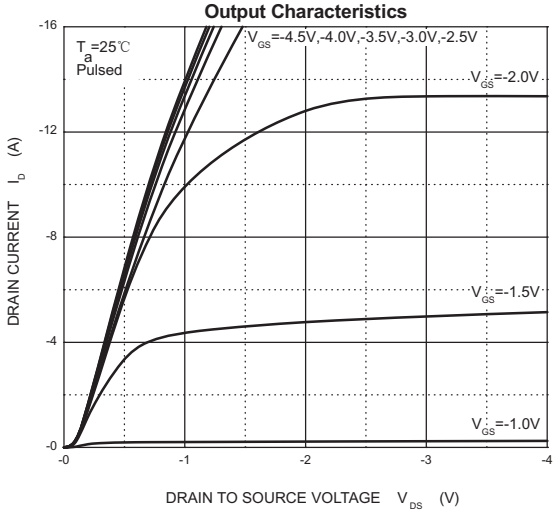
Electrical characteristics (At T_A=25°C unless otherwise noted)

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Static						
Drain-source breakdown voltage	V_{GS} = 0V, I_D =-10μA	$V_{(BR)DSS}$	-20			V
Zero gate voltage drain current	V_{DS} =-16V,V_{GS} = 0V	I_{DSS}			-1.0	μA
Gate-body leakage current	V_{GS} =±12V, V_{DS} = 0V	I_{GSS}			±100	nA
Gate threshold voltage	V_{DS} =V_{GS}, I_D =-250μA	$V_{GS(th)}$	-0.4		-0.9	V
Drain-source on-resistance	V_{GS} =-4.5V, I_D =-3.3A V_{GS} =-2.5V, I_D =-2.8A V_{GS} =-1.8V, I_D =-2.3A	$R_{DS(on)}$			0.057 0.076 0.110	Ω
Forward tranconductance	V_{DS} =-5V, I_D =-3.3A	g_{FS}	3			S
Diode forward voltage	I_S=-1.6A, V_{GS} = 0V	V_{SD}			-1.2	V
Dynamic (note 1)						
Intput capacitance	V_{DS} =-6V,V_{GS} =0V,f =1MHz	C_{iss}		715		pF
Output capacitance		C_{oss}		170		
Reverse transfer capacitance		C_{rss}		120		
Total gate charge	V_{DS} =-6V,V_{GS} =-4.5V, I_D =-3.3A	Q_g			13	nC
Gate-source charge		Q_{gs}		1.2		
Gate-drain charge		Q_{gd}		2.2		
Switching characteristics (note 1)						
Turn-on delay time	V_{GEN}=-4.5V,V_{DD}=-6V, I_D =-1.0A,R_G=6Ω, R_L=6Ω	$t_{d(on)}$			25	ns
Rise time		t_r			55	
Turn-off delay time		$t_{d(off)}$			90	
Fall time		t_f			60	

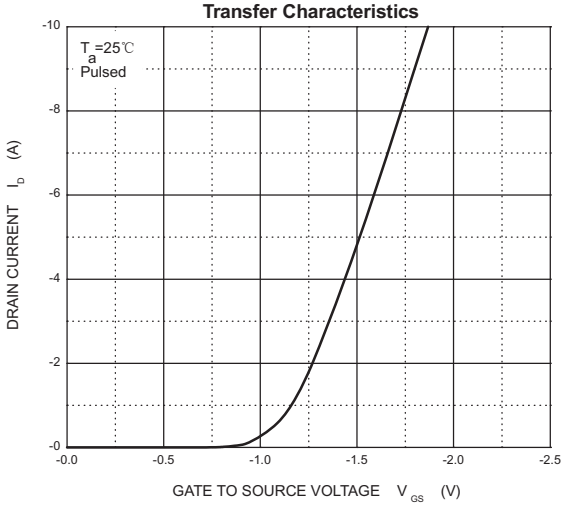
Note1:Pulse test : pulse width ≤300μs, duty cycle ≤2%.

Rating and characteristic curves (FMOS2321)

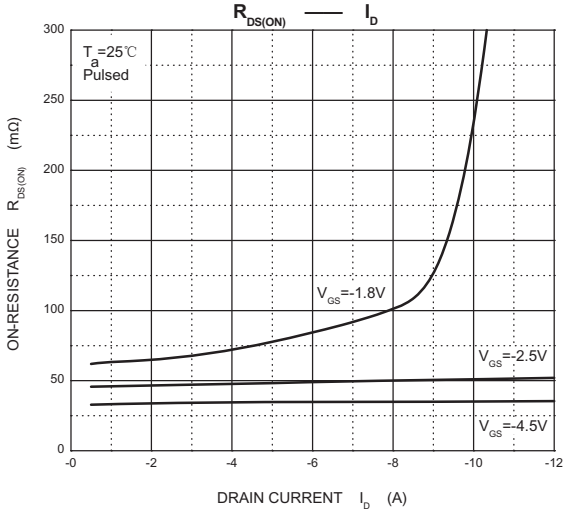
Output Characteristics



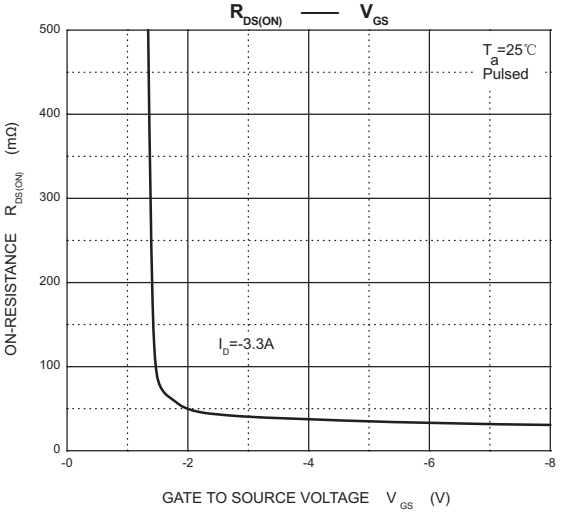
Transfer Characteristics



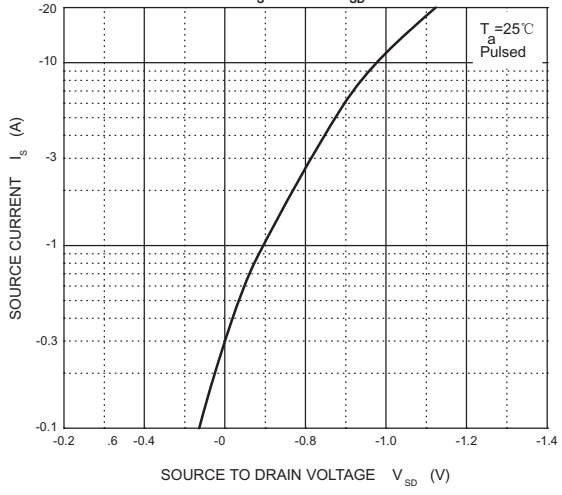
$R_{DS(ON)}$ —— I_D



$R_{DS(ON)}$ —— V_{GS}

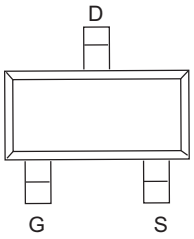
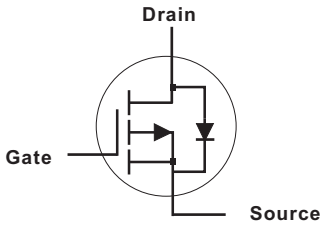


I_S —— V_{SD}



FMOS2321

Pinning information

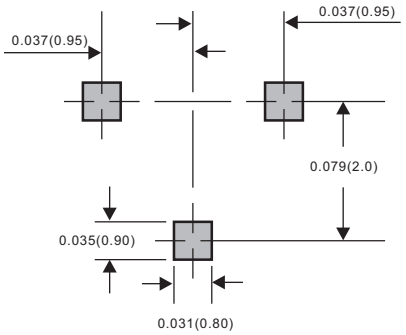
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMOS2321	S21

Suggested solder pad layout

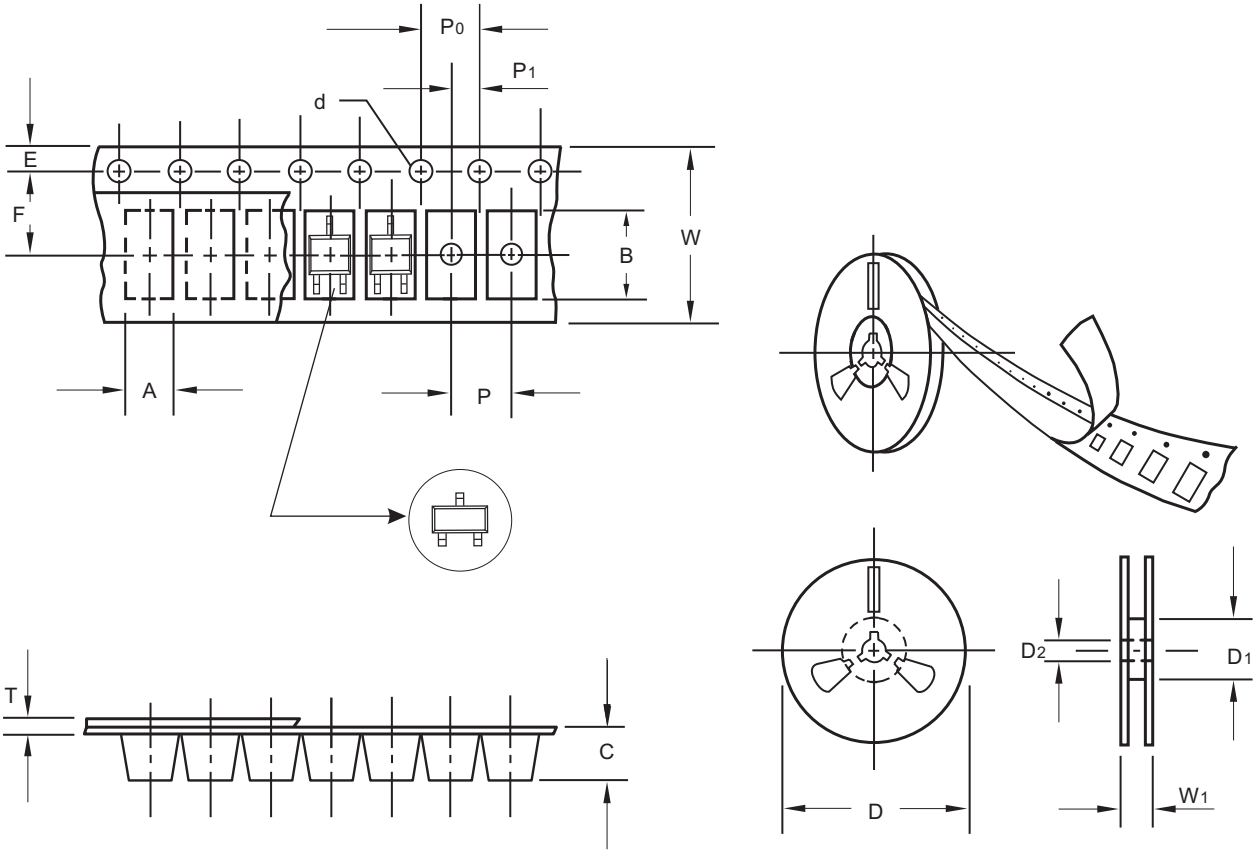
SOT-23



Dimensions in inches and (millimeters)

FMOS2321

Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	3.15
Carrier length	B	0.1	2.77
Carrier depth	C	0.1	1.22
Sprocket hole	d	0.1	1.50
13" Reel outside diameter	D	2.0	-
13" Reel inner diameter	D_1	min	-
7" Reel outside diameter	D	2.0	178.00
7" Reel inner diameter	D_1	min	54.40
Feed hole diameter	D_2	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	P_0	0.1	4.00
Embossment center	P_1	0.1	2.00
Overall tape thickness	T	0.1	0.23
Tape width	W	0.3	8.00
Reel width	W_1	1.0	9.50

Note:Devices are packed in accor dance with EIA standar RS-481-A and specifications listed above.

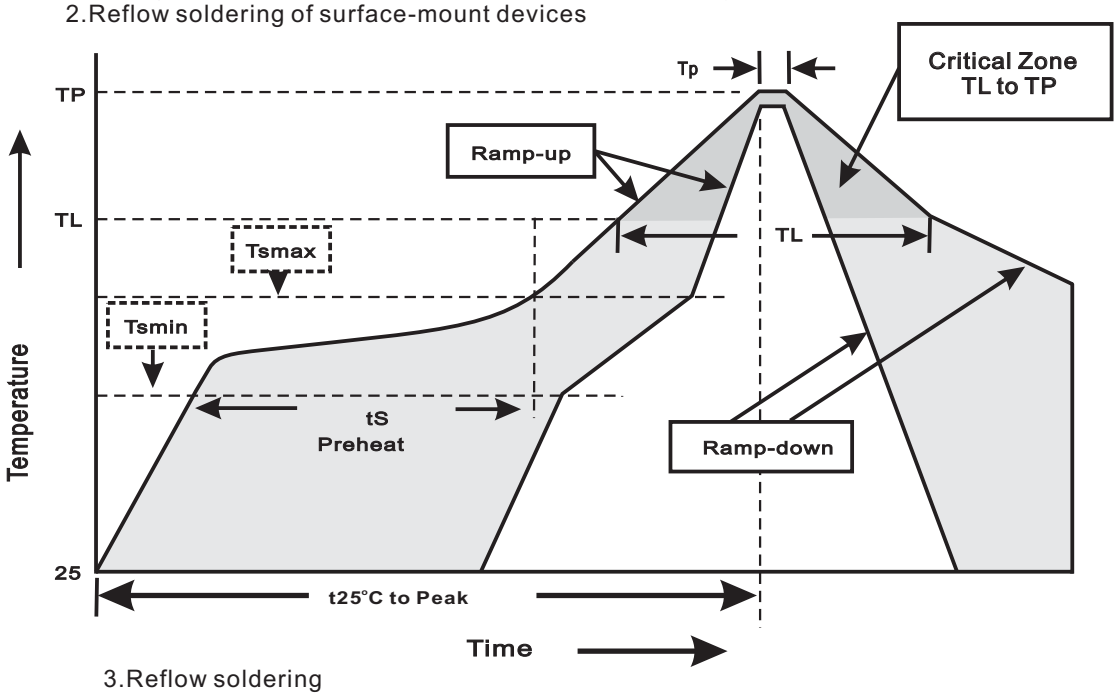
FMOS2321

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)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3,000	4.0	30,000	183*123*183	178	382*257*387	240,000	11.6

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	<6°C/sec
Time 25°C to Peak Temperature	<6minutes