

FMS2305

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FMS2305

30V P-Channel Enhancement Mode MOSFET

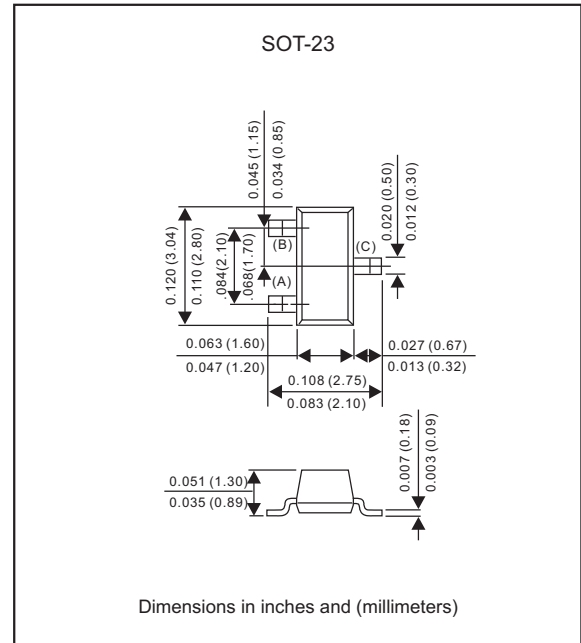
Features

- Advanced trench process technology
- High Density Cell Design For Ultra Low On-Resistance
- Suffix "-H" indicates Halogen-free part, ex.FMS2305-H.

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

Package outline



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

PARAMETER	Symbol	Limit	UNIT
Drain-Source Voltage	V_{DS}	-30	V
Continuous Drain Current Pulsed Drain Current 1)	I_D I_{DM}	-4.2 -30	A
Gate-Source Voltage	V_{GS}	± 12	V
Total Power Dissipation	P_D	1.4	W
Junction-to-Ambient Thermal Resistance (PCB mounted) 2)	$R_{\theta JA}$	140	$^{\circ}\text{C/W}$
Operation junction temperature range	T_J	-55 to +150	$^{\circ}\text{C}$
Storage temperature range	T_{STG}	-55 to +150	$^{\circ}\text{C}$

Note: 1. Repetitive Rating: Pulse width limited by the Maximum junction temperature
2. 1-in² 2oz Cu PCB board

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

PARAMETER	CONDITIONS	Symbol	MIN.	TYP.	MAX.	UNIT
Static 2)						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	BV_{DSS}	-30			V
Zero Gate Voltage Drain Current	$V_{DS} = -24V, V_{GS} = 0V$	I_{DSS}			-1.0	μA
Gate Body Leakage	$V_{GS} = \pm 12V, V_{DS} = 0$	I_{GSS}			± 100	nA
Forward Transconductance	$V_{DS} = -5V, I_D = -5.0A$	g_{fs}	7	11		S
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	$V_{GS(th)}$	-0.7		-1.3	V
Drain-Source On-State Resistance	$V_{GS} = -10V, I_D = -4.2A$ $V_{GS} = -4.5V, I_D = -4.0A$ $V_{GS} = -2.5V, I_D = -1.0A$	$R_{DS(on)}$		53 64 86	70 85 130	m Ω
Dynamic 3)						
Input capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}		826.18		μF
Output capacitance		C_{oss}		90.74		
Reverse transfer capacitance		C_{rss}		53.18		
Total Gate Charge	$V_{DS} = -15V, I_D = -4.0A$ $V_{GS} = -4.5V$	Q_g		6.36		nC
Gate-Source Charge		Q_{gs}		1.79		
Gate-Drain Charge		Q_{gd}		1.42		
Turn-On Delay Time	$V_{DD} = -15V, R_g = 3.6\Omega$ $I_D = -1.0A, V_{GEN} = -10V, R_g = 6\Omega$	$t_{d(on)}$		11.36		ns
Turn-On Rise Time		t_r		2.32		
Turn-Off Delay Time		$t_{d(off)}$		34.88		
Turn-Off Fall Time		t_f		3.52		
Source-Drain Diode						
Max. Diode Forward Current		I_S			-2.2	A
Diode Forward Voltage	$I_S = -1.0A, V_{GS} = 0V$	V_{SD}			-1.0	V

- Note: 1. Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
2. Static parameters are based on package level with recommended wire-bonding
3. Guaranteed by design; not subject to production testing

Rating and characteristic curves (FMS2305)

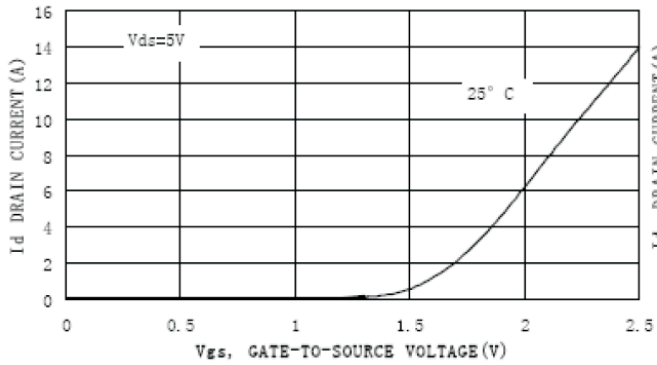


Figure 1. Transfer Characteristics

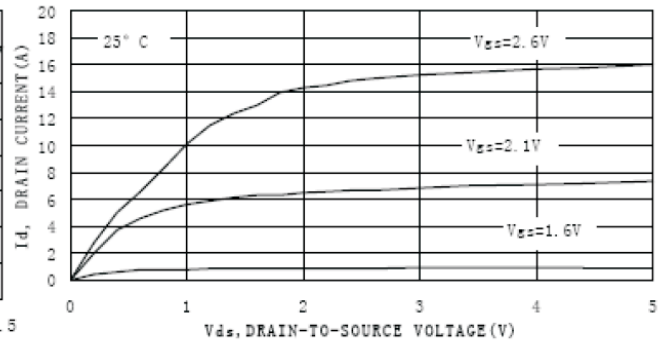


Figure 2. On-Region Characteristics

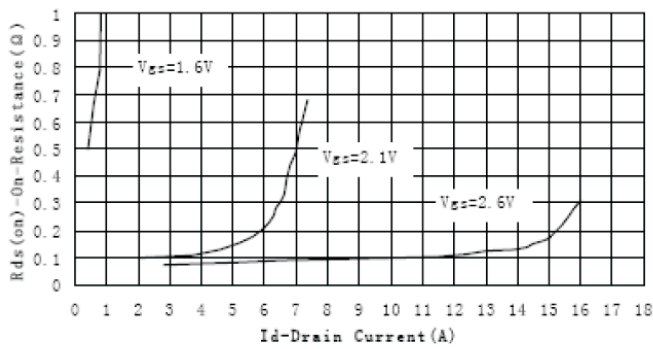


Figure 3. On-Resistance versus Drain Current

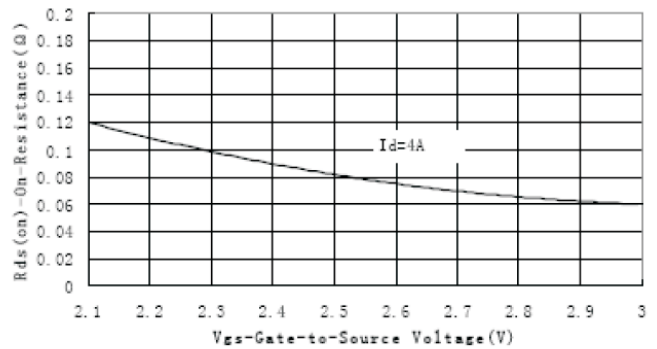
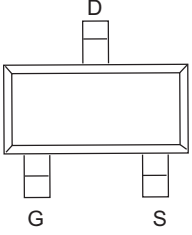
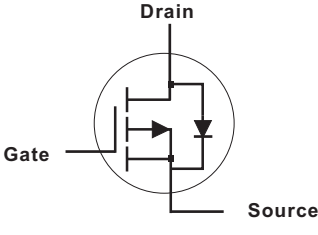


Figure 4. On-Resistance vs. Gate-to-Source Voltage

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Pinning information

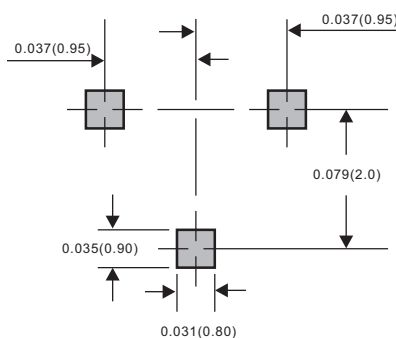
Pin	Simplified outline	Symbol
PinD Drain PinG Gate PinS Source		

Marking

Type number	Marking code
FMS2305	P05

Suggested solder pad layout

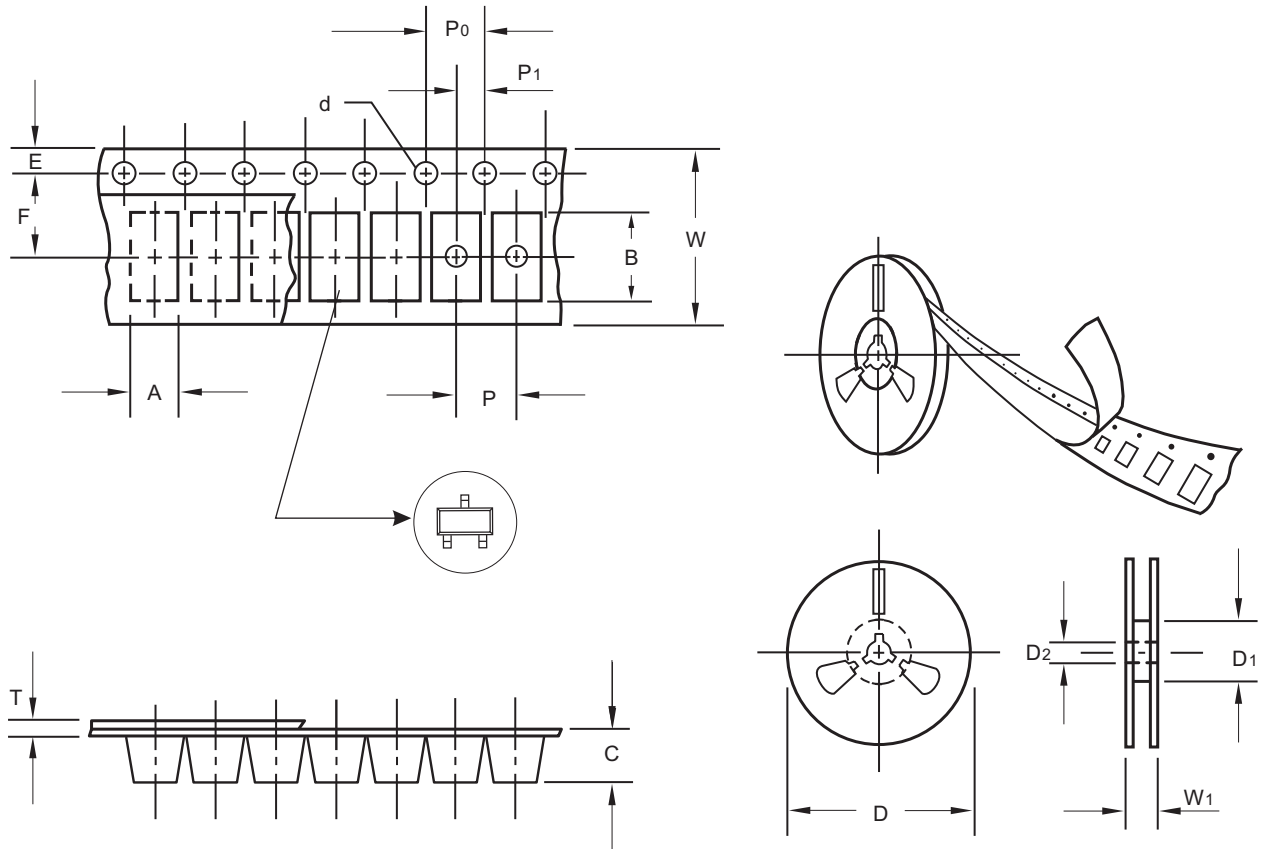
SOT-23



Dimensions in inches and (millimeters)

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Packing information



unit:mm

Item	Symbol	Tolerance	SOT-23
Carrier width	A	0.1	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	55.00
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	12.0

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

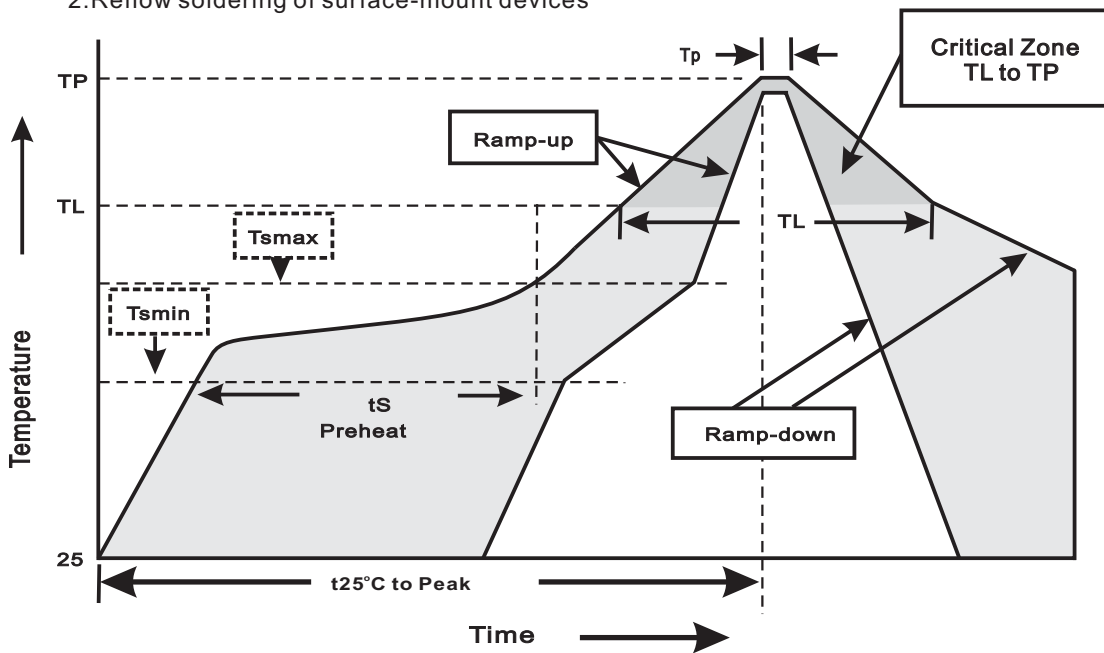
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Reel packing

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)	APPROX. GROSS WEIGHT (kg)
SOT-23	7"	3000	4.0	30,000	183*183*123	178	383*262*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(T _{min}) -Temperature Max(T _{max}) -Time(min to max)(t _s)	150°C 200°C 60~120sec
T _{max} 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