



TSM2312

20V N-Channel Enhancement Mode MOSFET

SOT-23



Pin assignment:

1. Gate
2. Source
3. Drain

$V_{DS} = 20V$

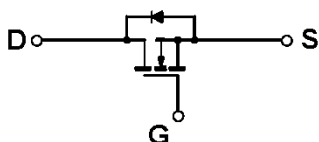
$R_{DS(on)}, V_{GS} @ 4.5V, I_{DS} @ 5.0A = 33m\Omega$

$R_{DS(on)}, V_{GS} @ 2.5V, I_{DS} @ 4.0A = 40m\Omega$

Features

- ✧ Advanced trench process technology
- ✧ Excellent thermal and electrical capabilities
- ✧ High density cell design for ultra low on-resistance
- ✧ Compact and low profile SOT-23 package

Block Diagram



Ordering Information

Part No.	Packing	Package
TSM2312CX	Tape & Reel	SOT-23

Absolute Maximum Rating ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	20V	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	5	A
Pulsed Drain Current	I_{DM}	15	A
Maximum Power Dissipation	$T_a = 25^\circ C$	P_D	W
		1.25	
	$T_a = 75^\circ C$	0.8	
Operating Junction Temperature	T_J	+150	$^\circ C$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	- 55 to +150	$^\circ C$

Thermal Performance

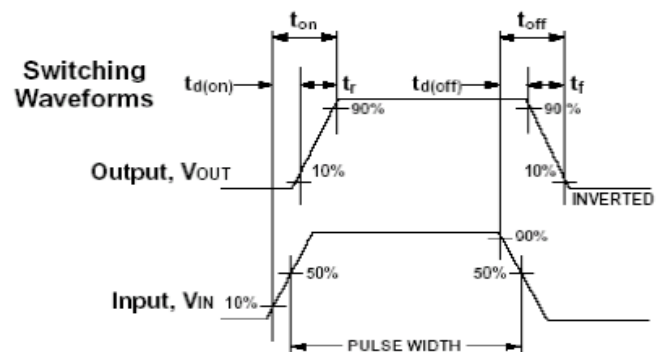
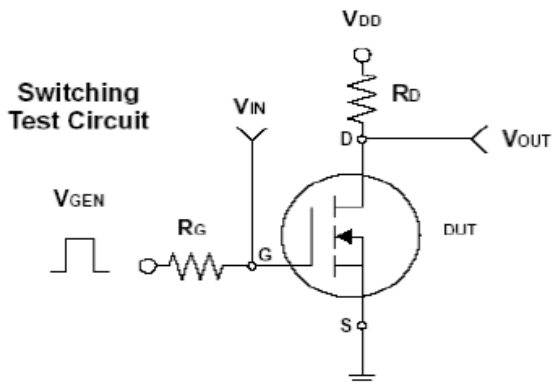
Parameter	Symbol	Limit	Unit
Lead Temperature (1/8" from case)	T_L	5	S
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta ja}$	100	$^\circ C/W$

Note: Surface mounted on FR4 board $t \leq 5sec$.

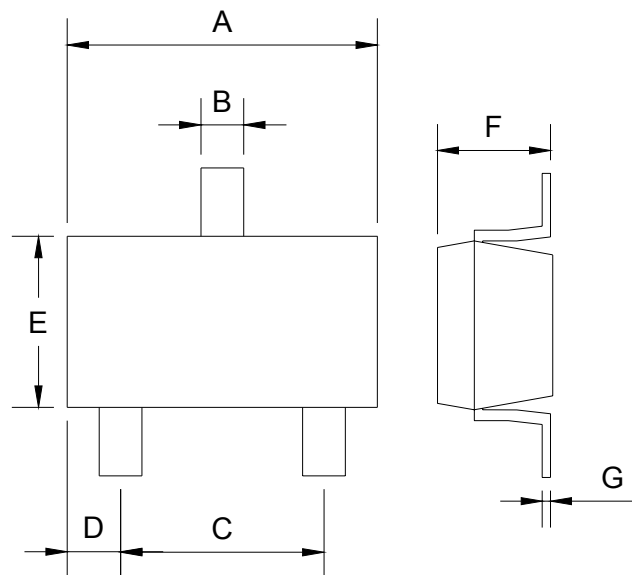


Electrical Characteristics						
Ta = 25 °C, unless otherwise noted						
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	BV _{DSS}	20	--	--	V
Drain-Source On-State Resistance	V _{GS} = 4.5V, I _D = 5.0A	R _{DS(ON)}	--	25	33	mΩ
Drain-Source On-State Resistance	V _{GS} = 2.5V, I _D = 4.0A	R _{DS(ON)}	--	35	40	
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	V _{GS(TH)}	0.45	--	--	V
Zero Gate Voltage Drain Current	V _{DS} = 20V, V _{GS} = 0V	I _{DSS}	--	--	1.0	uA
Gate Body Leakage	V _{GS} = ± 8V, V _{DS} = 0V	I _{GSS}	--	--	± 100	nA
On-State Drain Current	V _{DS} ≥ 10V, V _{GS} = 4.5V	I _{D(ON)}	15	--	--	A
Forward Transconductance	V _{DS} = 5V, I _D = 5.0A	g _{fs}	--	20	--	S
Dynamic						
Total Gate Charge	V _{DS} = 10V, I _D = 3.6A, V _{GS} = 4.5V	Q _g	--	11	14	nC
Gate-Source Charge		Q _{gs}	--	1.4	--	
Gate-Drain Charge		Q _{gd}	--	2.2	--	
Turn-On Delay Time	V _{DD} = 10V, R _L = 10Ω, I _D = 1A, V _{GEN} = 4.5V, R _G = 6Ω	t _{d(on)}	--	15	25	nS
Turn-On Rise Time		t _r	--	40	60	
Turn-Off Delay Time		t _{d(off)}	--	48	70	
Turn-Off Fall Time		t _f	--	31	45	
Input Capacitance	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	900	--	pF
Output Capacitance		C _{oss}	--	140	--	
Reverse Transfer Capacitance		C _{rss}	--	100	--	
Source-Drain Diode						
Max. Diode Forward Current		I _S	--	--	1.6	A
Diode Forward Voltage	I _S = 1.0A, V _{GS} = 0V	V _{SD}	--	0.75	1.2	V

Note : pulse test: pulse width ≤ 300μs, duty cycle ≤ 2%



SOT-23 Mechanical Drawing



SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.88	2.91	0.113	0.115
B	0.39	0.42	0.015	0.017
C	1.78	2.03	0.070	0.080
D	0.51	0.61	0.020	0.024
E	1.59	1.66	0.063	0.065
F	1.04	1.08	0.041	0.043
G	0.07	0.09	0.003	0.004