TSC Sb

TSM2312

20V N-Channel Enhancement Mode MOSFET

SOT-23



Pin assignment:

- 1. Gate
- 2. Source
- 3. Drain

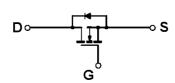
 $V_{DS} = 20V$

 $R_{DS (on)}$, Vgs @ 4.5V, Ids @ 5.0A = 33m Ω $R_{DS (on)}$, Vgs @ 2.5V, Ids @ 4.0A = 40m Ω

Features

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

Block Diagram



Ordering Information

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

Absolute Maximum Rating (Ta = 25℃ 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	А	
Pulsed Drain Current		I _{DM}	15	А	
Maximum Power Dissipation	Ta = 25 °C	P _D	1.25	W	
	Ta = 75 °C		0.8		
Operating Junction Temperature		TJ	+150	°C	
Operating Junction and Storage Temperature Range		T _J , T _{STG}	- 55 to +150	°C	

Thermal Performance

Parameter	Symbol	Limit	Unit
Lead Temperature (1/8" from case)	TL	5	S
Junction to Ambient Thermal Resistance (PCB mounted)	Rθja	100	°C/W

Note: Surface mounted on FR4 board t<=5sec.

TSM2312 1-1 2003/12 rev. A

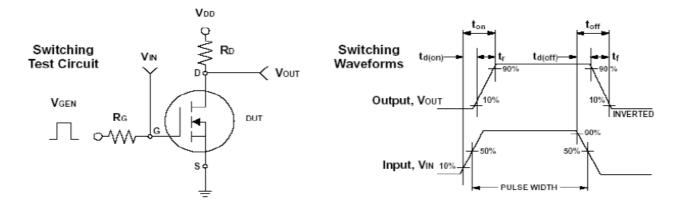


Electrical Characteristics

Ta = 25 °C, unless otherwise noted

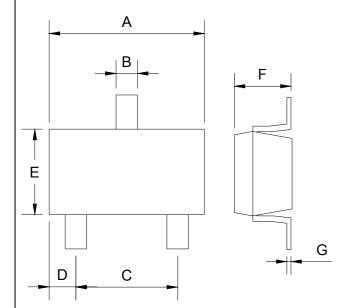
Parameter	Conditions	Symbol	Min	Тур	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250uA$	BV _{DSS}	20			V
Drain-Source On-State	$V_{GS} = 4.5V, I_D = 5.0A$	R _{DS(ON)}		25	33	
Resistance						mΩ
Drain-Source On-State	$V_{GS} = 2.5V, I_D = 4.0A$	R _{DS(ON)}		35	40	
Resistance						
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	$V_{GS} = \pm 8V, V_{DS} = 0V$	I _{GSS}			± 100	nA
On-State Drain Current	$V_{DS} \ge 10V$, $V_{GS} = 4.5V$	I _{D(ON)}	15			Α
Forward Transconductance	$V_{DS} = 5V, I_{D} = 5.0A$	9 _{fs}		20		S
Dynamic						
Total Gate Charge	$V_{DS} = 10V, I_D = 3.6A,$	Q_g		11	14	
Gate-Source Charge	V _{GS} = 4.5V	Q_{gs}		1.4		nC
Gate-Drain Charge		Q_{gd}		2.2		
Turn-On Delay Time	$V_{DD} = 10V, R_L = 10\Omega,$	$t_{d(on)}$		15	25	
Turn-On Rise Time	$I_D = 1A, V_{GEN} = 4.5V,$	t _r		40	60	nS
Turn-Off Delay Time	$R_G = 6\Omega$	$t_{d(off)}$		48	70	
Turn-Off Fall Time		t _f		31	45	
Input Capacitance	$V_{DS} = 10V, V_{GS} = 0V,$	C _{iss}		900		
Output Capacitance	f = 1.0MHz	C _{oss}		140		pF
Reverse Transfer Capacitance		C _{rss}		100		
Source-Drain Diode		•		·		
Max. Diode Forward Current		I _S			1.6	Α
Diode Forward Voltage	I _S = 1.0A, V _{GS} = 0V	V_{SD}		0.75	1.2	V

Note: pulse test: pulse width <=300uS, duty cycle <=2%





SOT-23 Mechanical Drawing



SOT-23 DIMENSION					
DIM	MILLIMETERS		INCHES		
	MIN	MAX	MIN	MAX	
Α	2.88	2.91	0.113	0.115	
В	0.39	0.42	0.015	0.017	
С	1.78	2.03	0.070	0.080	
D	0.51	0.61	0.020	0.024	
Ε	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	