

SOT-223



Pin Definition:

1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
30	60 @ $V_{GS}=10V$	5
	90 @ $V_{GS}=4.5V$	3.8

Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance

Application

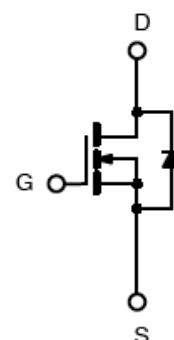
- Load Switch
- PA Switch

Ordering Information

Part No.	Package	Packing
TSM05N03CW RPG	SOT-223	2.5Kpcs / 13" Reel

Note: "G" denotes Halogen Free Product.

Block Diagram



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	5	A
Pulsed Drain Current	I_{DM}	± 20	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	1.7	A
Maximum Power Dissipation	P_D	3	W
		1.1	
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
Junction to Case Thermal Resistance	$R_{\theta JC}$	15	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta JA}$	45	$^\circ C/W$

Notes:

- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on a 1 in² pad of 2oz Cu, $t \leq 5$ sec.

Electrical Specifications (Ta = 25°C unless otherwise noted)

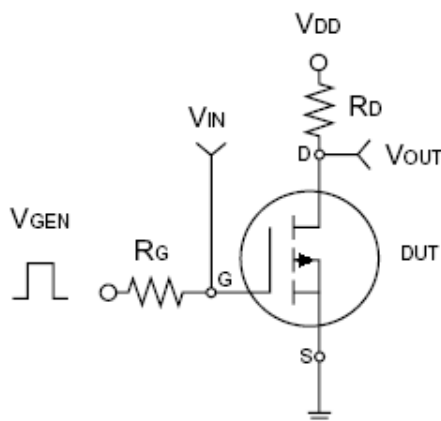
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	BV_{DSS}	30	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1	--	3	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = 30V, V_{GS} = 0V$	I_{DSS}	--	--	1.0	μA
On-State Drain Current	$V_{DS} = 5V, V_{GS} = 10V$	$I_{D(ON)}$	5	--	--	A
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 5A$	$R_{DS(ON)}$	--	46	60	m Ω
	$V_{GS} = 4.5V, I_D = 3.8A$		--	70	90	
Forward Transconductance	$V_{DS} = 10V, I_D = 5A$	g_{fs}	--	5	--	S
Diode Forward Voltage	$I_S = 2.5A, V_{GS} = 0V$	V_{SD}	--	--	1.2	V
Dynamic ^b						
Total Gate Charge	$V_{DS} = 10V, I_D = 5A,$ $V_{GS} = 5V$	Q_g	--	4.2	7	nC
Gate-Source Charge		Q_{gs}	--	1.9	--	
Gate-Drain Charge		Q_{gd}	--	1.35	--	
Input Capacitance	$V_{DS} = 15V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	555	--	pF
Output Capacitance		C_{oss}	--	120	--	
Reverse Transfer Capacitance		C_{rss}	--	60	--	
Switching ^{b,c}						
Turn-On Delay Time	$V_{DD} = 10V, R_L = 15\Omega,$ $I_D = 1A, V_{GEN} = 10V,$ $R_G = 6\Omega$	$t_{d(on)}$	--	4.2	5.5	nS
Turn-On Rise Time		t_r	--	19	25	
Turn-Off Delay Time		$t_{d(off)}$	--	13	17	
Turn-Off Fall Time		t_f	--	9	12	

Notes:

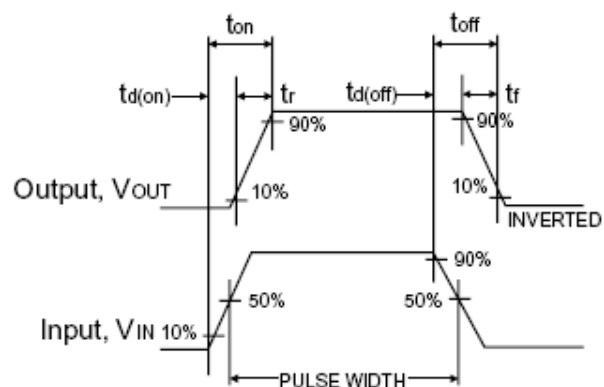
a. pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$

b. For DESIGN AID ONLY, not subject to production testing.

c. Switching time is essentially independent of operating temperature.

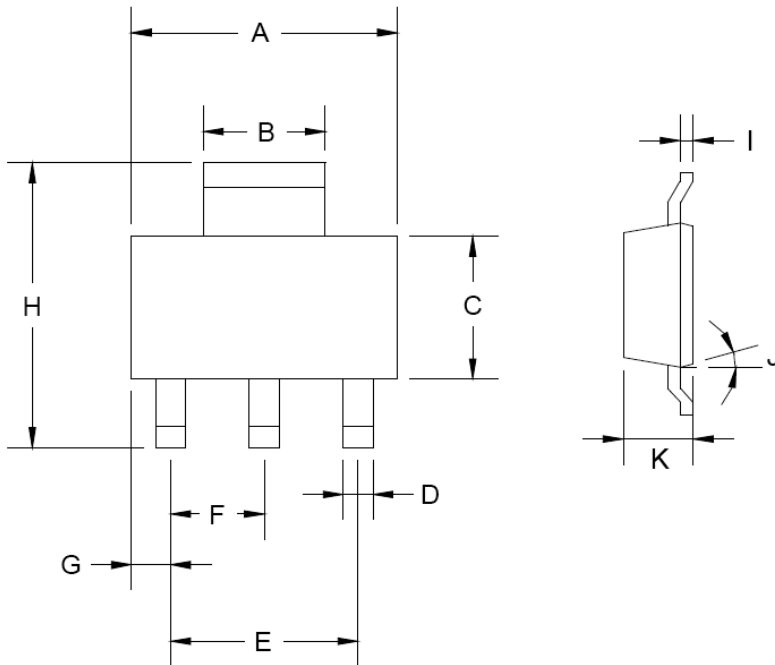


Switching Test Circuit



Switchin Waveforms

SOT-223 Mechanical Drawing



SOT-223 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.350	6.850	0.250	0.270
B	2.900	3.100	0.114	0.122
C	3.450	3.750	0.136	0.148
D	0.595	0.635	0.023	0.025
E	4.550	4.650	0.179	0.183
F	2.250	2.350	0.088	0.093
G	0.835	1.035	0.032	0.041
H	6.700	7.300	0.263	0.287
I	0.250	0.355	0.010	0.014
J	10°	16°	10°	16°
K	1.550	1.800	0.061	0.071

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