

SOT-223



Pin Definition:

1. Gate
2. Drain
3. Source

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ (m $\Omega$ )	$I_D$ (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

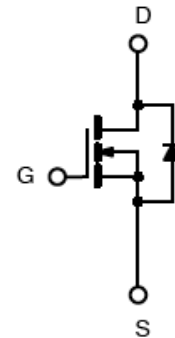
- Load Switch
- PA Switch

### 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	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	5	A
Pulsed Drain Current	$I_{DM}$	$\pm 20$	A
Continuous Source Current (Diode Conduction) <sup>a,b</sup>	$I_S$	1.7	A
Maximum Power Dissipation	$P_D$	$T_a = 25^{\circ}C$	3
		$T_a = 75^{\circ}C$	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:

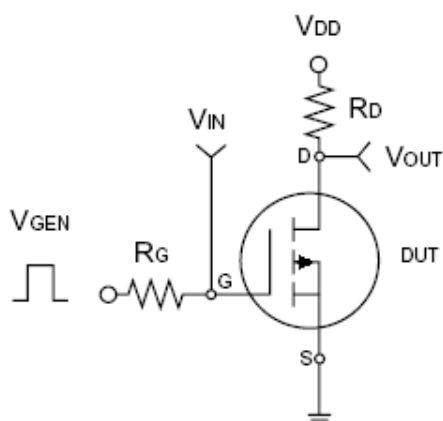
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on a 1 in<sup>2</sup> pad of 2oz Cu,  $t \leq 5$  sec.

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

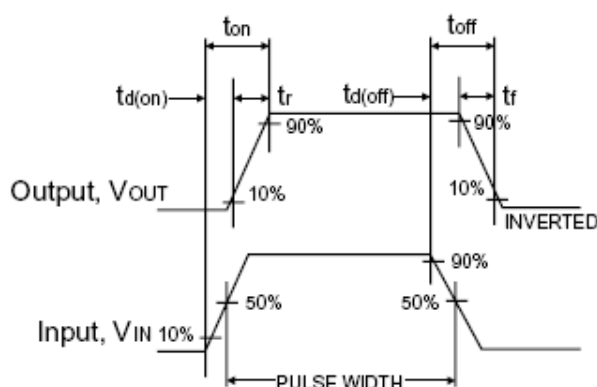
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 250\mu A$	$BV_{DSS}$	30	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1	--	3	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	$I_{GSS}$	--	--	$\pm 100$	nA
Zero Gate Voltage Drain Current	$V_{DS} = 30V, V_{GS} = 0V$	$I_{DSS}$	--	--	1.0	$\mu A$
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 $\Omega$
	$V_{GS} = 4.5V, I_D = 3.8A$		--	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
<b>Dynamic<sup>b</sup></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	--	
<b>Switching<sup>b,c</sup></b>						
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.

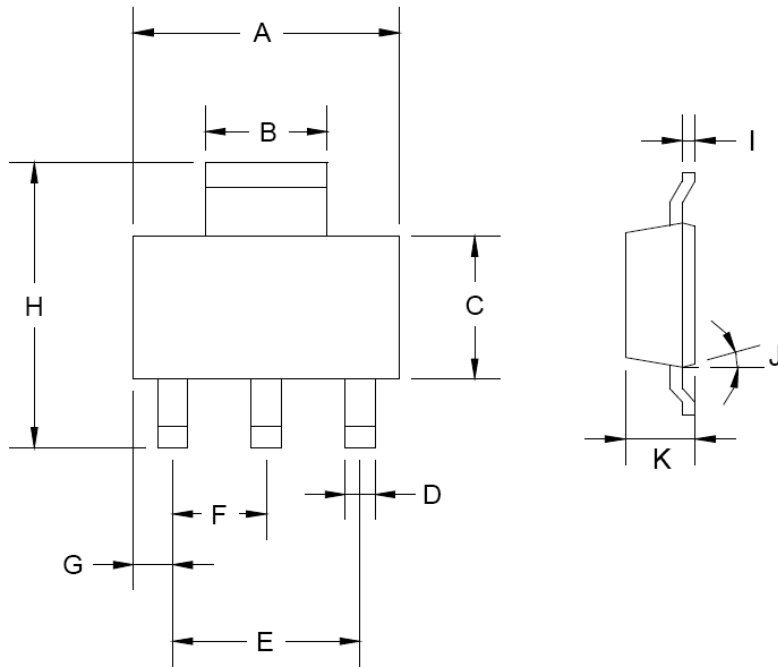


Switching Test Circuit



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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