TSM05N03

30V N-Channel MOSFET

SOT-223

Pin Definition:
1. Gate
2. Drain
3. Source

PRODUCT SUMMARY

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

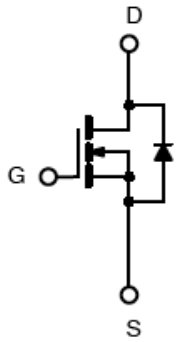
Features

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

Application

- Load Switch
- PA Switch

Block Diagram



N-Channel MOSFET

Ordering Information

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

Note: "G" denotes Halogen Free Product.

Absolute Maximum Rating (Ta = 25°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	Ta = 25°C	P_D	3	W
	Ta = 75°C		1.1	
Operating Junction Temperature		T_J	+150	°C
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	°C

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R\Theta_{JC}$	15	°C/W
Junction to Ambient Thermal Resistance (PCB mounted)	$R\Theta_{JA}$	45	°C/W

Notes:

a. Pulse width limited by the Maximum junction temperature

b. Surface Mounted on a 1 in^2 pad of 2oz Cu, t ≤ 5 sec.

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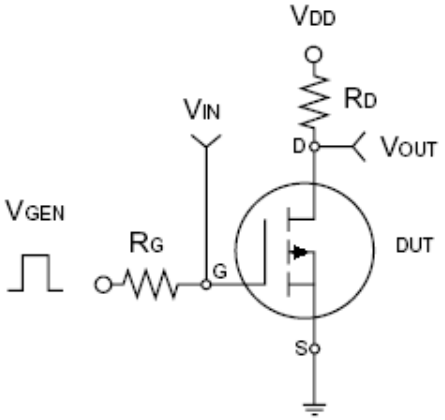
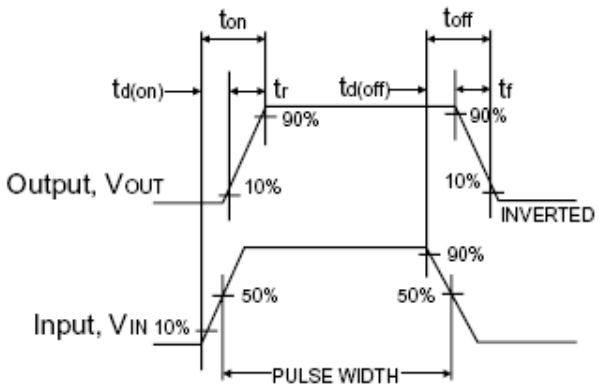
Electrical Specifications (Ta = 25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250μA	BV_{DSS}	30	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	1	--	3	V
Gate Body Leakage	V_{GS} = ±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	mΩ
	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 = 15Ω, I_D = 1A, V_{GEN} = 10V, R_G = 6Ω	$t_{d(on)}$	--	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 ≤300μS, duty cycle ≤2%
b. For DESIGN AID ONLY, not subject to production testing.
c. Switching time is essentially independent of operating temperature.

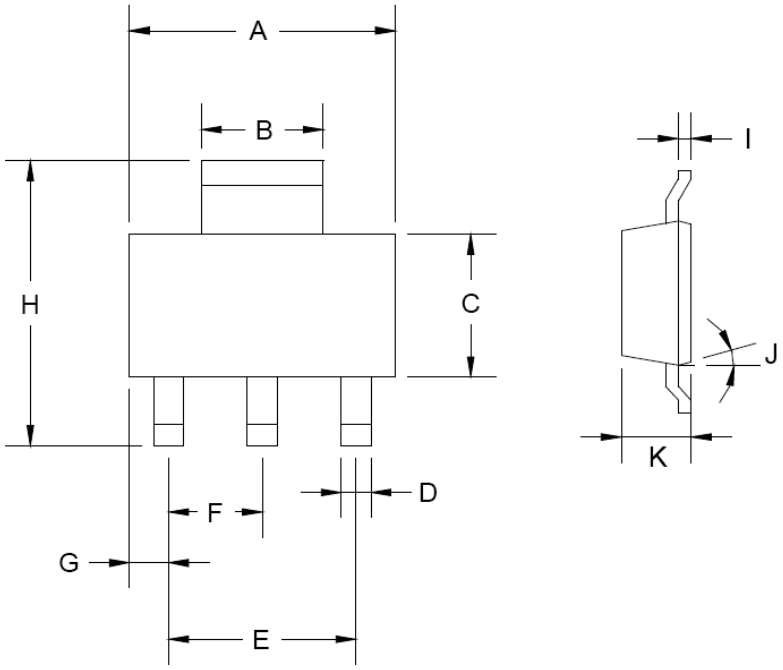


Switching Test Circuit



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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