

SOP-8



Pin Definition:

- 1. Source 8. Drain
- 2. Source 7. Drain
- 3. Source 6. Drain
- 4. Gate 5. Drain

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
-30	26 @ $V_{GS} = -20V$	-8.0
	35 @ $V_{GS} = -10V$	-8.0

Features

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

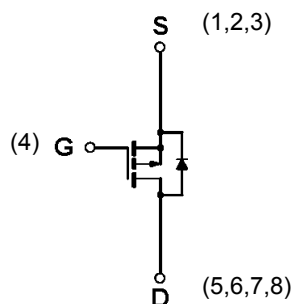
Application

- Load Switch
- PA Switch

Ordering Information

Part No.	Package	Packing
TSM4415CS RL	SOP-8	2.5kpcs/13" reel

Block Diagram



P-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}	± 25	V
Continuous Drain Current, $V_{GS} @ 4.5V$.	I_D	-8	A
Pulsed Drain Current, $V_{GS} @ 4.5V$	I_{DM}	-30	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	-1	A
Maximum Power Dissipation	P_D	$T_a = 25^\circ C$	3
		$T_a = 70^\circ C$	2.1
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 Foot (Drain) Thermal Resistance	$R_{\theta_{JF}}$	30	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta_{JA}}$	75	$^\circ C/W$

Notes:

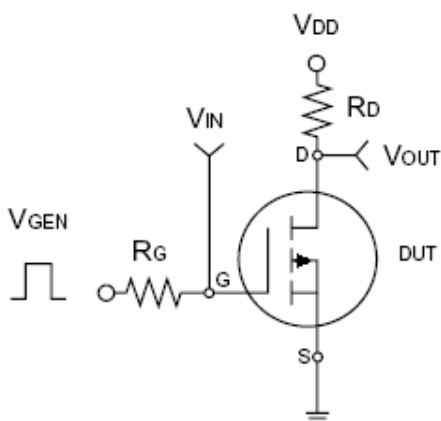
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 5$ sec.

Electrical Specifications

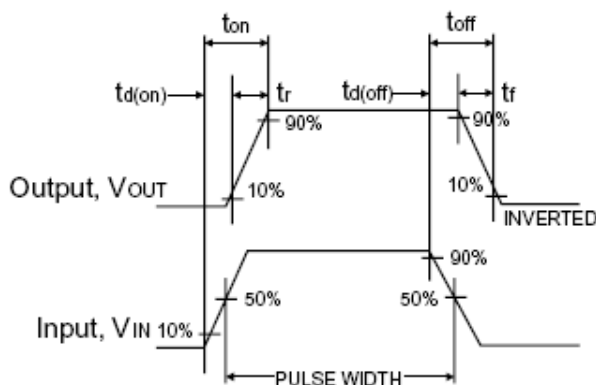
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	BV_{DSS}	-30	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	$V_{GS(TH)}$	-1.0	--	-3.0	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = -24V, V_{GS} = 0V$	I_{DSS}	--	--	-1.0	μA
On-State Drain Current ^a	$V_{DS} \geq -10V, V_{GS} = -5V$	$I_{D(ON)}$	-6	--	--	A
Drain-Source On-State Resistance ^a	$V_{GS} = -20V, I_D = -8A$	$R_{DS(ON)}$	--	21	26	m Ω
	$V_{GS} = -10V, I_D = -8A$		--	28	35	
	$V_{GS} = -6V, I_D = -5A$		--	41	--	
Forward Transconductance ^a	$V_{DS} = -5V, I_D = -8A$	g_{fs}	--	11.5	--	S
Diode Forward Voltage	$I_S = -1A, V_{GS} = 0V$	V_{SD}	--	-0.8	-1.0	V
Dynamic^b						
Total Gate Charge	$V_{DS} = -15V, I_D = -8A,$ $V_{GS} = -10V$	Q_g	--	18.1	--	nC
Gate-Source Charge		Q_{gs}	--	6.5	--	
Gate-Drain Charge		Q_{gd}	--	3.2	--	
Input Capacitance	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	1047.9	--	pF
Output Capacitance		C_{oss}	--	172.8	--	
Reverse Transfer Capacitance		C_{rss}	--	115.5	--	
Switching^c						
Turn-On Delay Time	$V_{DD} = -15V, R_L = 1.8\Omega,$ $I_D = -1A, V_{GEN} = -10V,$ $R_G = 3\Omega$	$t_{d(on)}$	--	20.5	--	nS
Turn-On Rise Time		t_r	--	4.4	--	
Turn-Off Delay Time		$t_{d(off)}$	--	42.8	--	
Turn-Off Fall Time		t_f	--	7.3	--	

Notes:

- a. pulse test: PW $\leq 300\mu S$, duty cycle $\leq 2\%$
- b. For DESIGN AID ONLY, not subject to production testing.
- b. Switching time is essentially independent of operating temperature.

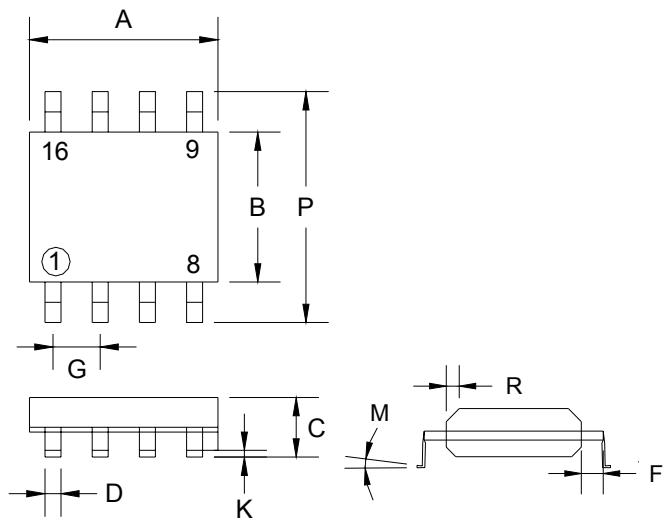


Switching Test Circuit



Switchin Waveforms

SOP-8 Mechanical Drawing



SOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A	4.80	5.00	0.189	0.196
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27BSC		0.05BSC	
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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