TSM4420

Preliminary

N-Channel Enhancement Mode MOSFET

SOP-8

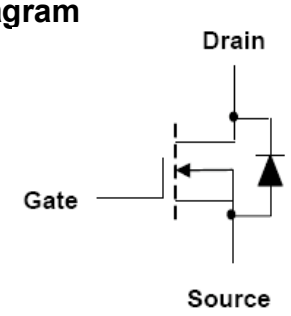
Pin assignment:
1. Source
2. Source
3. Source
4. Gate
5, 6, 7, 8. Drain

V_{DS} = 25V
I_D = 13.5A
$R_{DS\ (on)}$, Vgs @ 10V, Ids @ 13.5A = 8.5mΩ
$R_{DS\ (on)}$, Vgs @ 4.5V, Ids @ 11A = 11mΩ

Features

- ✧ Advanced trench process technology
- ✧ High Density Cell Design for Ultra Low On-Resistance
- ✧ Fully Characterized Avalanche Voltage and Current

Block Diagram



Ordering Information

Part No.	Packing	Package
TSM4420CS	**Tape & Reel** (2,500pcs / Reel)	SOP-8

Absolute Maximum Rating (T_A = 25 °C unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	25	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current		I_D	13.5	A
Pulsed Drain Current		I_{DM}	50	
Maximum Power Dissipation	T_A = 25 °C	P_D	2	W
	T_A = 70 °C		1.3	
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	Rθjc	2.2	°C/W
Junction to Ambient Thermal Resistance (PCB mounted)	Rθja	50	

Note: 1. Maximum DC current limited by the package
2. 1-in^2 2oz Cu PCB board

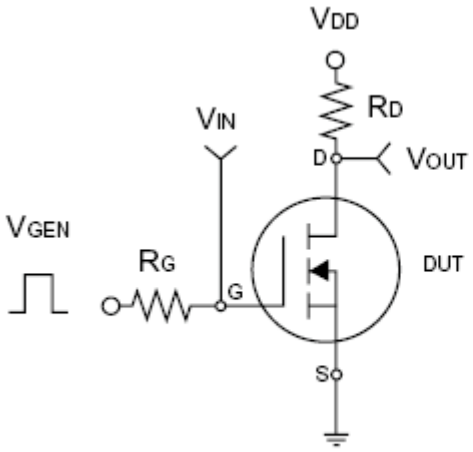
Electrical Characteristics

T_J = 25 °C, unless otherwise noted

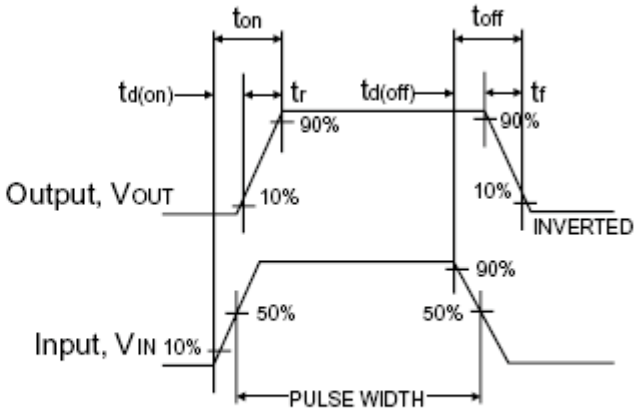
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	BV_{DSS}	25	--	--	V
Drain-Source On-State Resistance	V_{GS} = 4.5V, I_D = 11A	$R_{DS(ON)}$	--	9	11	mΩ
	V_{GS} = 10V, I_D = 13.5A	$R_{DS(ON)}$	--	7	8.5	mΩ
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	$V_{GS(TH)}$	1.0	--	3.0	V
Zero Gate Voltage Drain Current	V_{DS} = 24V, V_{GS} = 0V	I_{DSS}	--	--	1.0	uA
Gate Body Leakage	V_{GS} = ± 20V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Forward Transconductance	V_{DS} =10V, I_D = 35A	g_{fs}	--	50	--	S
Dynamic						
Total Gate Charge	V_{DS} = 15V, I_D = 13.5A, V_{GS} = 5V	Q_g	--	--	25	nC
Gate-Source Charge		Q_{gs}	--	6.6	--	
Gate-Drain Charge		Q_{gd}	--	4.0	--	
Turn-On Delay Time	V_{DD} = 15V, R_L = 15Ω, I_D = 1A, V_{GEN} = 10V, R_G = 24Ω	$t_{d(on)}$	--	15	25	nS
Turn-On Rise Time		t_r	--	11	18	
Turn-Off Delay Time		$t_{d(off)}$	--	40	60	
Turn-Off Fall Time		t_f	--	12	20	
Source-Drain Diode						
Max. Diode Forward Current		I_S	--	--	50	A
Diode Forward Voltage	I_S = 20A, V_{GS} = 0V	V_{SD}	--	0.75	1.1	V

Note: 1. pulse test: pulse width <=300uS, duty cycle <=2%

2. Negligible, Dominated by circuit inductance.

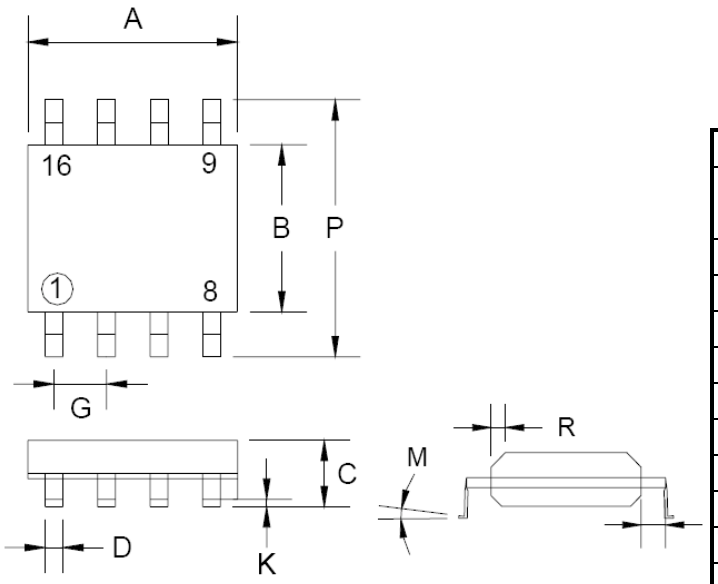


Switching Test Circuit



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	1.27 (typ)		0.05 (typ)	
K	0.10	0.25	0.004	0.009
M	0^o	7^o	0^o	7^o
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019