TSM9428

Preliminary

20V N-Channel Enhancement-Mode MOSFET

SOP-8

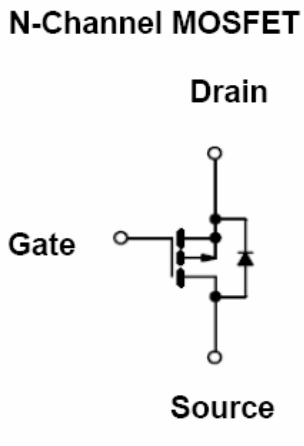
Pin assignment:
1. Source
2. Source
3. Source
4. Gate
5, 6, 7, 8. Drain

V_{DS} = 20V
$R_{DS\ (on)}$, Vgs @ 4.5V, Ids @ 6A =30mΩ
$R_{DS\ (on)}$, Vgs @ 2.5V, Ids @ 5.2A =40mΩ

Features

- ✧ Advanced trench process technology
- ✧ High density cell design for ultra low on-resistance
- ✧ Fully Characterized Avalanche Voltage and Current
- ✧ Improved Shoot-Through FOM

Block Diagram



Ordering Information

Part No.	Packing	Package
TSM9428CS	Tape & Reel 2,500/per reel	SOP-8

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	20V	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current,		I_D	6	A
Pulsed Drain Current,		I_{DM}	20	A
Maximum Power Dissipation	Ta = 25 °C	P_D	2.5	W
	Ta = 70 °C		1.6	
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 Foot (Drain) Thermal Resistance	Rθjf	30	°C/W
Junction to Ambient Thermal Resistance (PCB mounted)	Rθja	50	°C/W

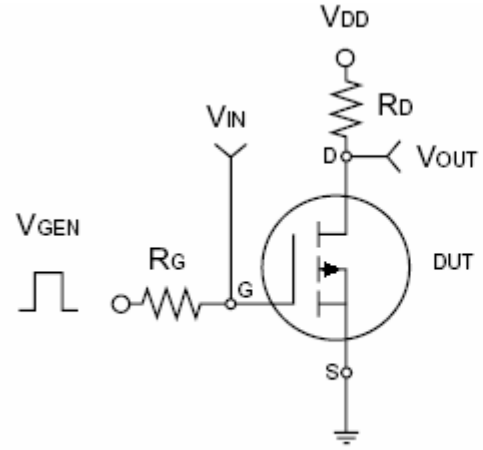
Note: Surface mounted on FR4 board t<=10sec.

Electrical Characteristics

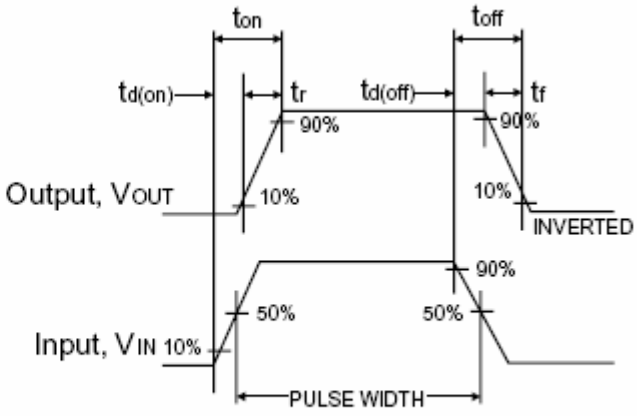
(Ta = 25 °C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 250uA	BV_{DSS}	20	--	--	V
Drain-Source On-State Resistance	V_{GS} = 4.5V, I_D = 6A	$R_{DS(ON)}$	--	23	30	mΩ
Drain-Source On-State Resistance	V_{GS} = 2.5V, I_D = 5.2A	$R_{DS(ON)}$	--	28	40	
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250uA	$V_{GS(TH)}$	0.6	--	--	V
Zero Gate Voltage Drain Current	V_{DS} = 20V, V_{GS} = 0V	I_{DSS}	--	--	1	uA
Gate Body Leakage	V_{GS} = ±8V, V_{DS} = 0V	I_{GSS}	--	--	±100	nA
Forward Transconductance	V_{DS} = 10V, I_D = 6A	g_{fs}	--	24	--	S
Dynamic						
Total Gate Charge	V_{DS} = 10V, I_D = 6A, V_{GS} = 4.5V	Q_g	--	21	40	nC
Gate-Source Charge		Q_{gs}	--	2.9	--	
Gate-Drain Charge		Q_{gd}	--	6.5	--	
Turn-On Delay Time	V_{DD} = 10V, R_L = 10Ω, I_D = 1A, V_{GEN} = 4.5V, R_G = 6Ω	$t_{d(on)}$	--	30	60	nS
Turn-On Rise Time		t_r	--	70	140	
Turn-Off Delay Time		$t_{d(off)}$	--	70	140	
Turn-Off Fall Time		t_f	--	30	60	
Input Capacitance	V_{DS} = 10V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	620	--	pF
Output Capacitance		C_{oss}	--	124	--	
Reverse Transfer Capacitance		C_{rss}	--	95	--	
Source-Drain Diode						
Max. Diode Forward Current		I_S	--	--	1.7	A
Diode Forward Voltage	I_S = 1.7A, V_{GS} = 0V	V_{SD}	--	--	1.2	V

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

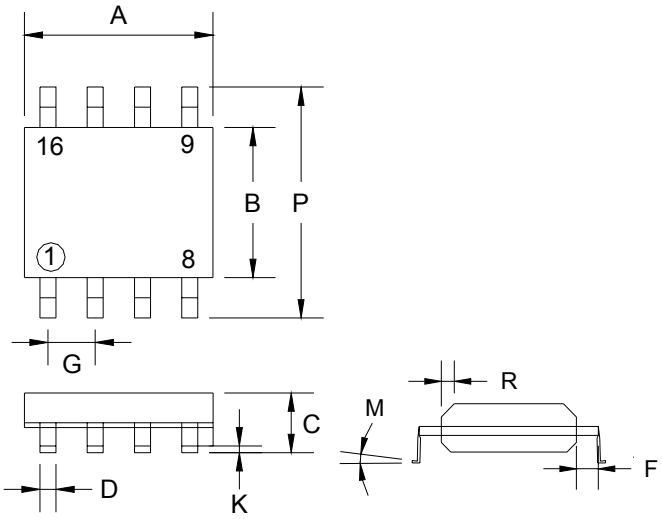


Switching Test Circuit



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