

SOP-8



Pin Definition:

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

PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ (m $\Omega$ )	$I_D$ (A)
20	14 @ $V_{GS} = 10V$	9.4
	16 @ $V_{GS} = 4.5V$	8
	22 @ $V_{GS} = 2.5V$	6
	30 @ $V_{GS} = 1.8V$	4

Features

- Advance Trench Process Technology
- High Density Cell Design for Ultra Low On-resistance
- ESD Protect 2KV

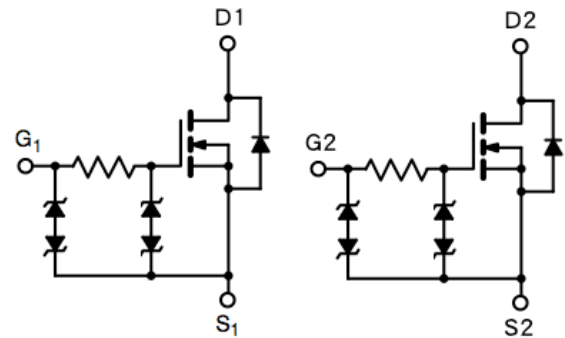
Application

- Specially Designed for Li-ion Battery Packs
- Battery Switch Application

Ordering Information

Part No.	Package	Packing
TSM9426DCS RL	SOP-8	2.5Kpcs / 13" Reel

Block Diagram



Dual N-Channel MOSFET

Absolute Maximum Rating ( $T_a = 25^\circ C$  unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	20	V
Gate-Source Voltage	$V_{GS}$	$\pm 12$	V
Continuous Drain Current, $V_{GS} @ 4.5V$ .	$I_D$	9.4	A
Pulsed Drain Current, $V_{GS} @ 4.5V$	$I_{DM}$	40	A
Continuous Source Current (Diode Conduction) <sup>a,b</sup>	$I_S$	3	A
Maximum Power Dissipation	$P_D$	$T_a = 25^\circ C$	2
		$T_a = 75^\circ C$	1.28
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	$R_{\theta_{JF}}$	45	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta_{JA}}$	62.5	$^\circ C/W$

Notes:

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

## Preliminary

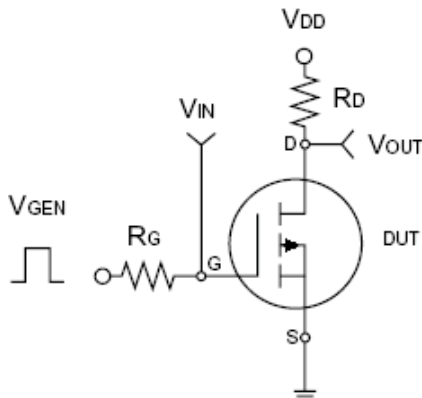
### 20V Dual N-Channel MOSFET w/ESD Protected

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

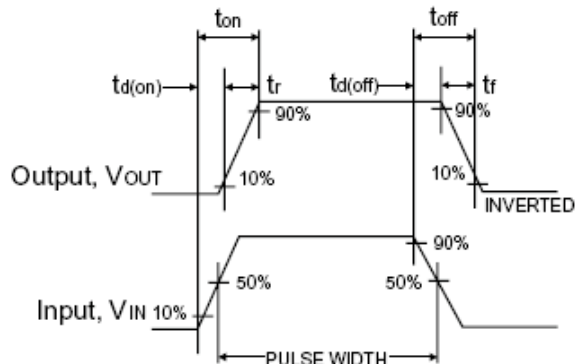
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	BV <sub>DSS</sub>	20	--	--	V
Gate Threshold Voltage	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250uA	V <sub>GS(TH)</sub>	0.5	0.75	1.0	V
Gate Body Leakage	V <sub>GS</sub> = ±10V, V <sub>DS</sub> = 0V	I <sub>GSS</sub>	--	--	±10	uA
Zero Gate Voltage Drain Current	V <sub>DS</sub> = 16V, V <sub>GS</sub> = 0V	I <sub>DSS</sub>	--	--	10	uA
On-State Drain Current	V <sub>DS</sub> = 5V, V <sub>GS</sub> = 4.5V	I <sub>D(ON)</sub>	30	--	--	A
Drain-Source On-State Resistance	V <sub>GS</sub> = 10V, I <sub>D</sub> = 9.4A	R <sub>DS(ON)</sub>	--	11	14	mΩ
	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8A		--	12.6	16	
	V <sub>GS</sub> = 2.5V, I <sub>D</sub> = 6A		--	16.5	22	
	V <sub>GS</sub> = 1.8V, I <sub>D</sub> = 4A		--	23.4	30	
Forward Transconductance	V <sub>DS</sub> = 5V, I <sub>D</sub> = 8A	g <sub>fs</sub>	--	37	--	S
Diode Forward Voltage	I <sub>S</sub> = 1A, V <sub>GS</sub> = 0V	V <sub>SD</sub>	--	0.72	1	V
<b>Dynamic<sup>b</sup></b>						
Total Gate Charge	V <sub>DS</sub> = 10V, I <sub>D</sub> = 8A, V <sub>GS</sub> = 4.5V	Q <sub>g</sub>	--	4.65	6.05	nC
Gate-Source Charge		Q <sub>gs</sub>	--	1.12	1.46	
Gate-Drain Charge		Q <sub>gd</sub>	--	3.72	4.84	
Input Capacitance	V <sub>DS</sub> = 10V, V <sub>GS</sub> = 0V, f = 1.0MHz	C <sub>iss</sub>	--	36.45	--	pF
Output Capacitance		C <sub>oss</sub>	--	183.88	--	
Reverse Transfer Capacitance		C <sub>rss</sub>	--	14.57	--	
<b>Switching<sup>c</sup></b>						
Turn-On Delay Time	V <sub>DD</sub> = 10V, R <sub>L</sub> = 1.2Ω, I <sub>D</sub> = 1A, V <sub>GEN</sub> = 10V, R <sub>G</sub> = 3Ω	t <sub>d(on)</sub>	--	487.6	--	nS
Turn-On Rise Time		t <sub>r</sub>	--	800.4	--	
Turn-Off Delay Time		t <sub>d(off)</sub>	--	1728	--	
Turn-Off Fall Time		t <sub>f</sub>	--	6180	--	

Notes:

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

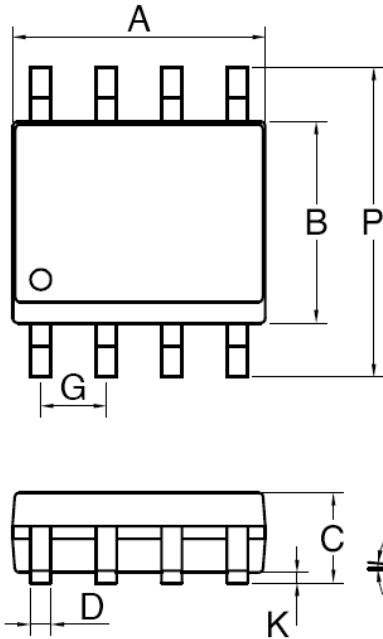


Switching Test Circuit



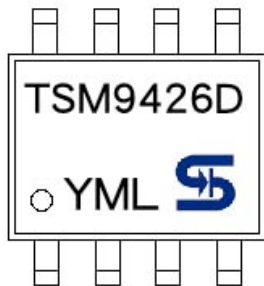
Switchin Waveforms

**SOP-8 Mechanical Drawing**



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

**Marking Diagram**



- Y** = Year Code
- M** = Month Code  
(A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
- L** = Lot Code

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