



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



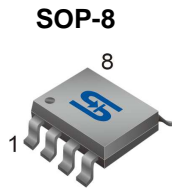
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Pin Definition:

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

Key Parameter Performance

Parameter	Value	Unit
V_{DS}	20	V
$R_{DS(on)}$ (max)	30	mΩ
Q_g	11.2	nC

Features

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

Application

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

Ordering Information

Part No.	Package	Packing
TSM4424CS RLG	SOP-8	2.5Kpcs / 13" Reel
TSM4424CS RVG	SOP-8	3Kpcs / 13" Reel

Note: "G" denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

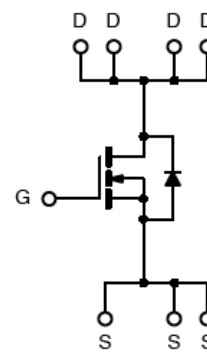
Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$, unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V _{DS}	20	V
Gate-Source Voltage		V _{GS}	±8	V
Continuous Drain Current		I _D	8	A
Pulsed Drain Current ^(Note 1)		I _{DM}	30	A
Continuous Source Current (Diode Conduction)		I _S	2.2	A
Maximum Power Dissipation	Ta = 25°C	P _D	2.5	W
	Ta = 75°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
Thermal Resistance Junction to Foot	$R_{\theta JF}$	25	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	52.5	$^\circ\text{C/W}$

Block Diagram



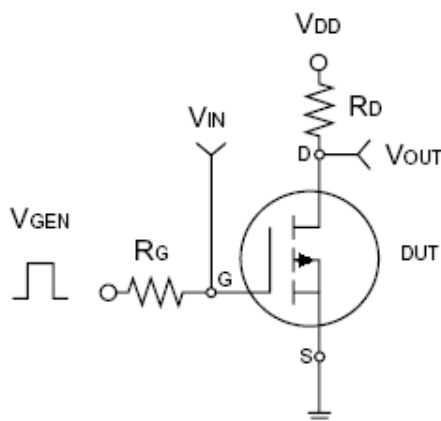
N-Channel MOSFET

Electrical Specifications

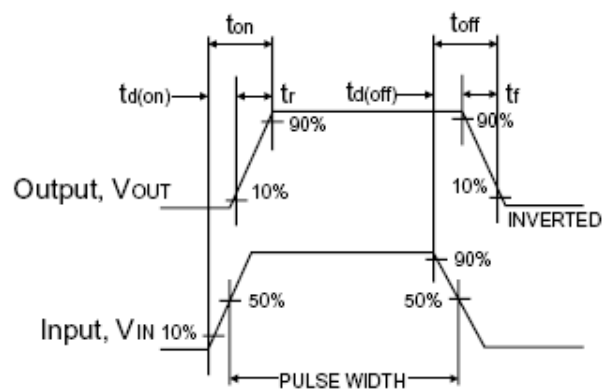
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static ^(Note 2)						
Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250uA	BV _{DSS}	20	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	V _{GS(TH)}	--	0.65	1	V
Gate Body Leakage	V _{GS} = ±8V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 20V, V _{GS} = 0V	I _{DSS}	--	--	1.0	uA
On-State Drain Current	V _{DS} =5V, V _{GS} = 4.5V	I _{D(ON)}	30	--	--	A
Drain-Source On-State Resistance	V _{GS} = 4.5V, I _D = 4.5A	R _{DS(ON)}	--	23	30	mΩ
	V _{GS} = 2.5V, I _D = 3.5A		--	25	35	
	V _{GS} = 1.8V, I _D = 2.0A		--	35	45	
Forward Transconductance	V _{DS} = 10V, I _D = 6A	g _{fs}	--	40	--	S
Diode Forward Voltage	I _S = 1.7A, V _{GS} = 0V	V _{SD}	--	0.8	1.2	V
Dynamic ^(Note 3)						
Total Gate Charge	V _{DS} = 10V, I _D = 4.5A, V _{GS} = 4.5V	Q _g	--	11.2	14	nC
Gate-Source Charge		Q _{gs}	--	1.4	--	
Gate-Drain Charge		Q _{gd}	--	2.2	--	
Input Capacitance	V _{DS} = 10V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	500	--	pF
Output Capacitance		C _{oss}	--	300	--	
Reverse Transfer Capacitance		C _{rss}	--	140	--	
Switching ^(Note 4)						
Turn-On Delay Time	V _{DD} = 10V, R _L = 10Ω, I _D = 1A, V _{GEN} = 4.5V, R _G = 6Ω	t _{d(on)}	--	15	25	ns
Turn-On Rise Time		t _r	--	30	60	
Turn-Off Delay Time		t _{d(off)}	--	35	70	
Turn-Off Fall Time		t _f	--	15	45	

Notes:

1. Pulse width limited by the maximum junction temperature
2. Pulse test: $PW \leq 300\mu s$, duty cycle $\leq 2\%$
3. For DESIGN AID ONLY, not subject to production testing.
4. Switching time is essentially independent of operating temperature.



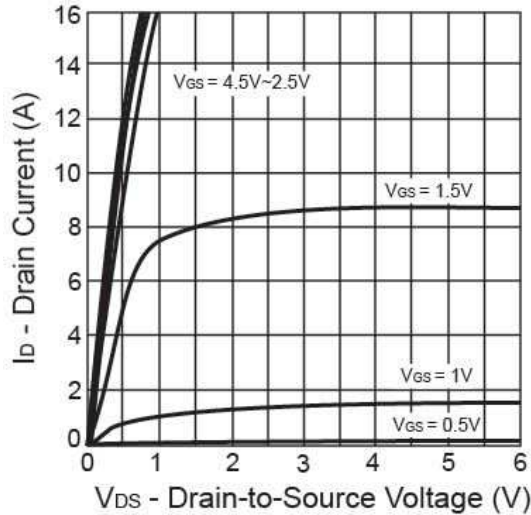
Switching Test Circuit



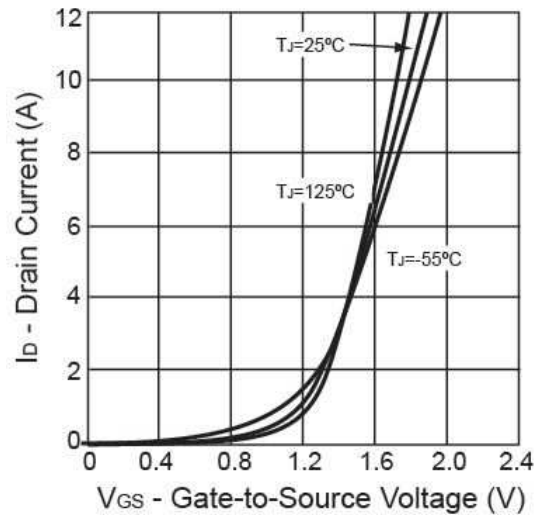
Switchin Waveforms

Electrical Characteristics Curve

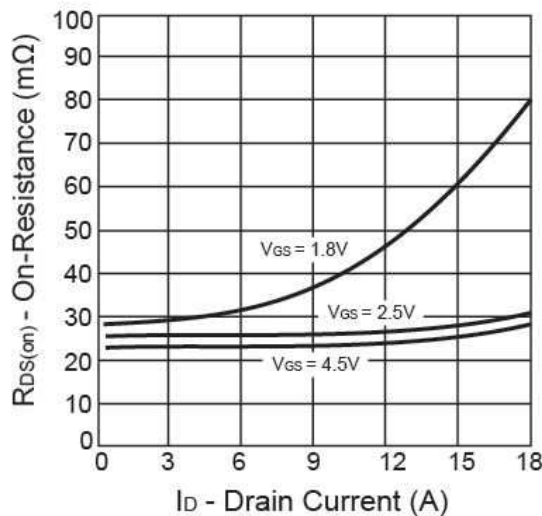
Output Characteristics



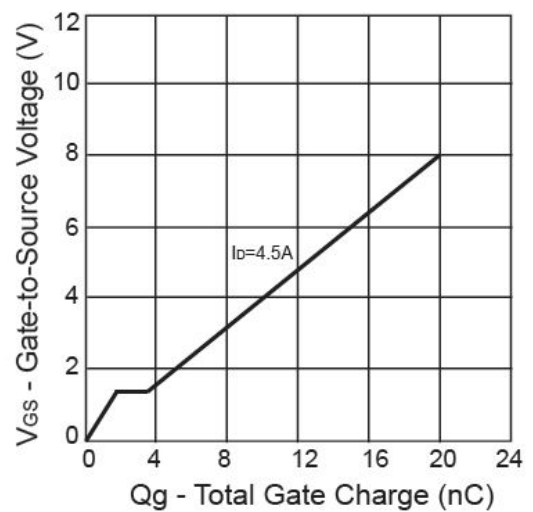
Transfer Characteristics



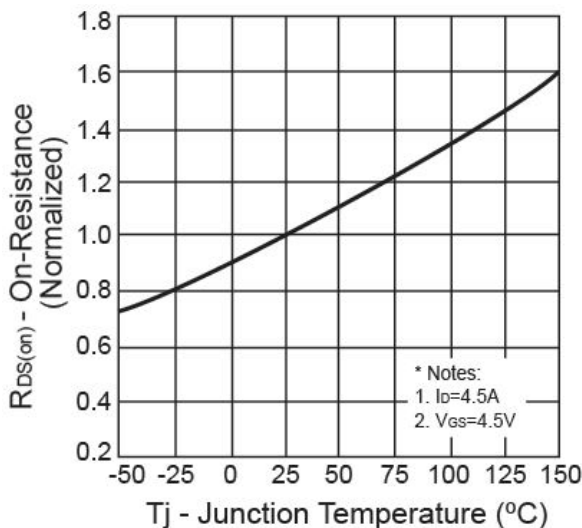
On-Resistance vs. Drain Current



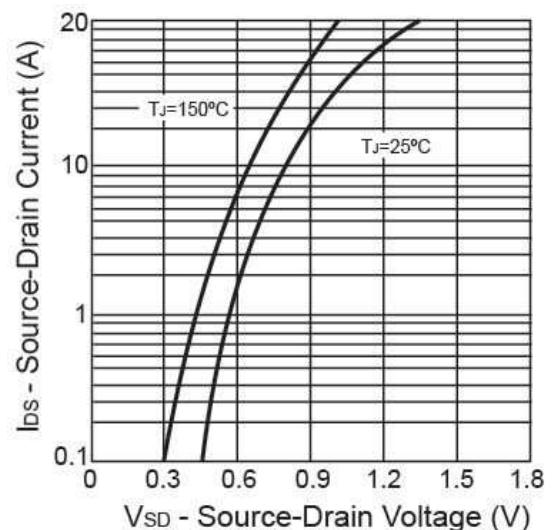
Gate Charge



On-Resistance vs. Junction Temperature

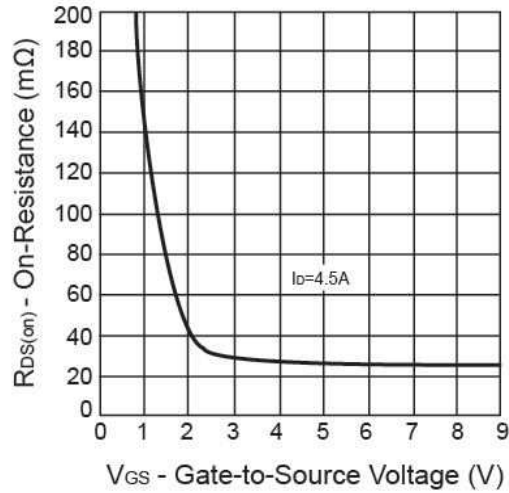


Source-Drain Diode Forward Voltage

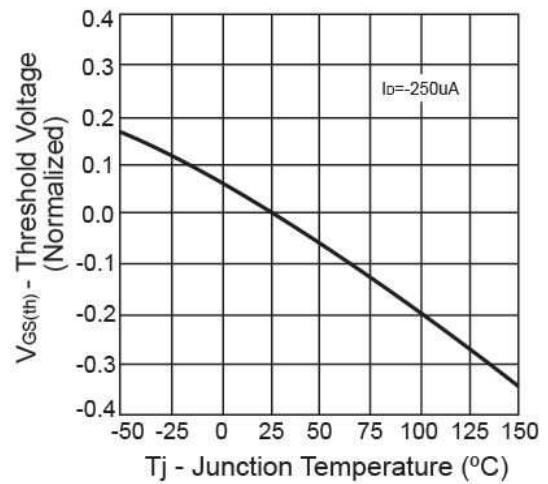


Electrical Characteristics Curve

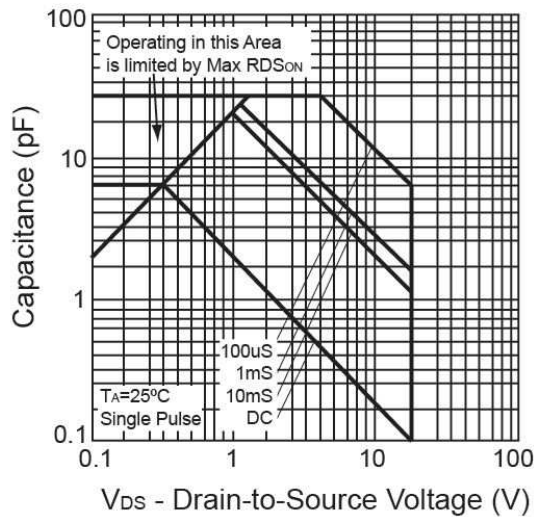
On-Resistance vs. Gate-Source Voltage



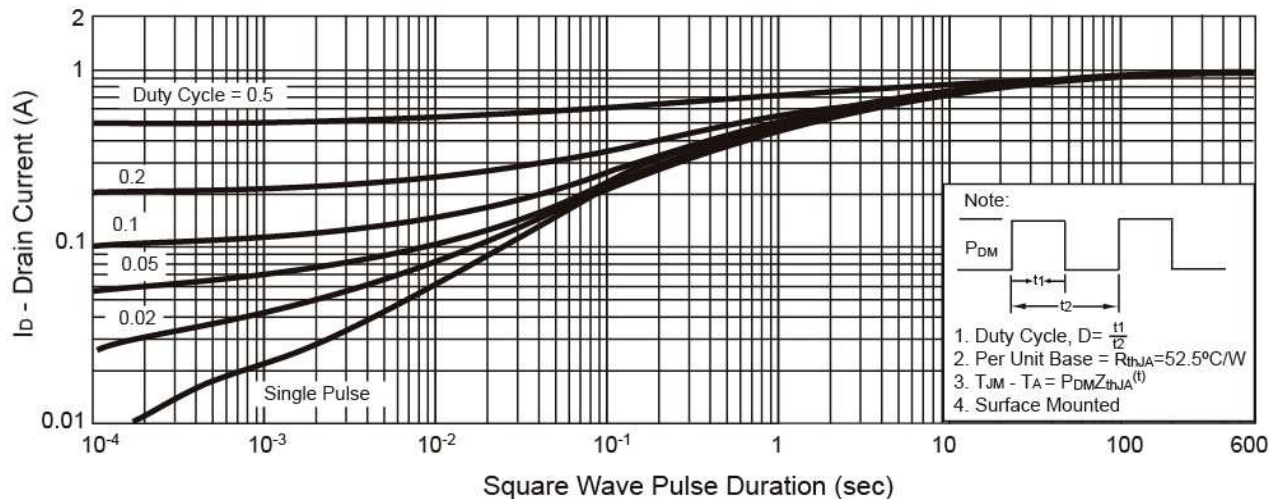
Threshold Voltage



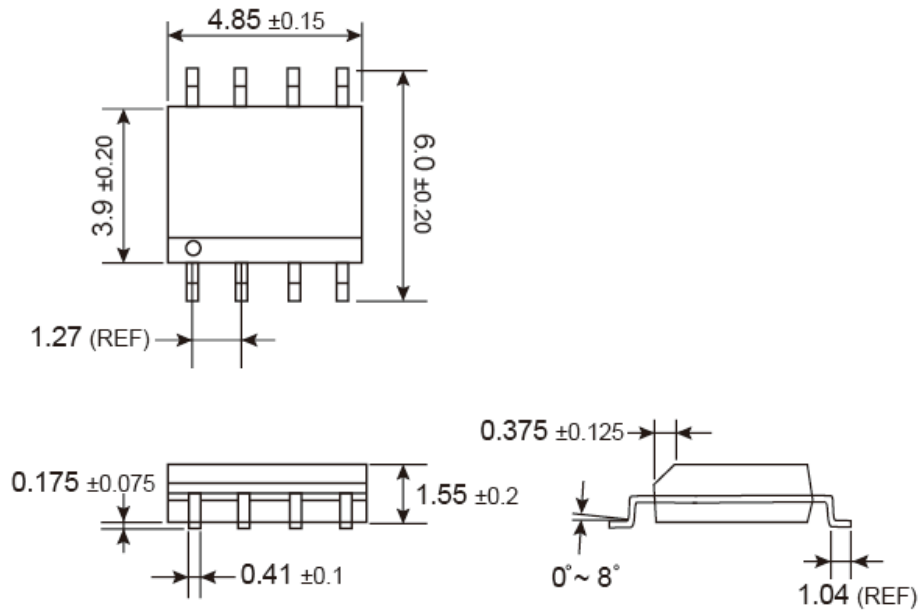
Safety Operation Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

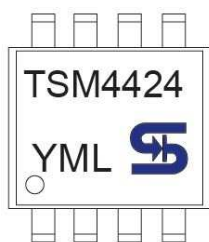


SOP-8 Mechanical Drawing



Unit: Millimeters

Marking Diagram



Y = Year Code

M = Month Code for Halogen Free Product

O =Jan **P** =Feb **Q** =Mar **R** =Apr

S =May **T** =Jun **U** =Jul **V** =Aug

W =Sep **X** =Oct **Y** =Nov **Z** =Dec

L = Lot Code

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