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.

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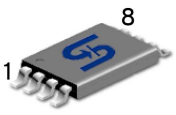
Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China

TSM6963SD

20V Dual P-Channel MOSFET

TSSOP-8



Pin Definition:

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

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$(mΩ)	I_D (A)
-20	30 @ V_{GS} = -4.5V	-4.5
	42 @ V_{GS} = -2.5V	-3
	68 @ V_{GS} = -1.8V	-2

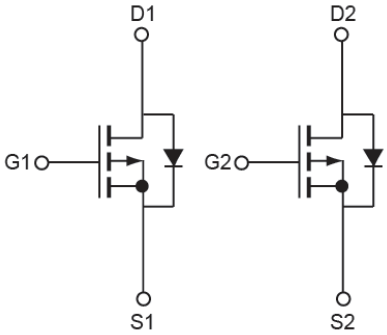
Features

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

Application

- Load Switch
- PA Switch

Block Diagram



Dual P-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM6963SDCA RVG	TSSOP-8	3Kpcs / 13" Reel

Note: "G" denote for Halogen Free Product

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current, V_{GS} @4.5V.		I_D	-4.5	A
Pulsed Drain Current, V_{GS} @4.5V		I_{DM}	-16	A
Continuous Source Current (Diode Conduction)[a,b]		I_S	-1.0	A
Maximum Power Dissipation	Ta = 25°C	P_D	1.14	W
	Ta = 70°C		0.73	
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	$R\Theta_{JF}$	75	°C/W
Junction to Ambient Thermal Resistance (PCB mounted)	$R\Theta_{JA}$	90	°C/W

Notes:

a. Surface Mounted on 1" x 1" FR4 Board.

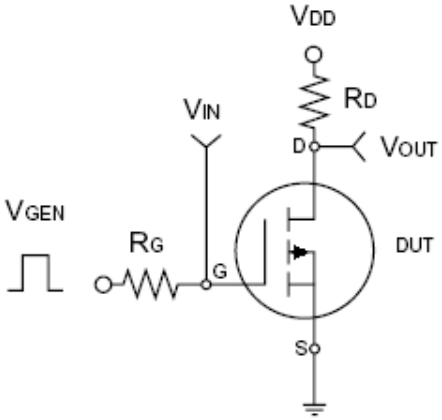
b. Pulse width limited by maximum junction temperature

TSM6963SD
20V Dual P-Channel MOSFET

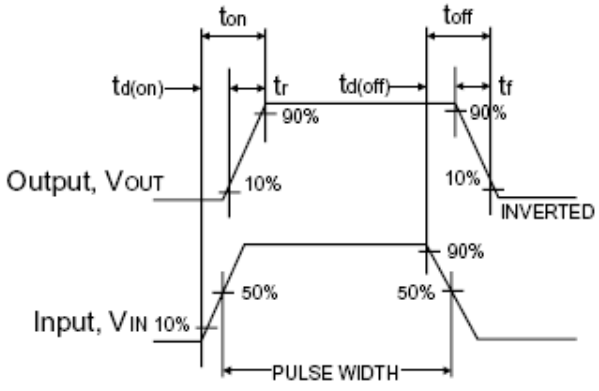
Electrical Specifications (Ta =25°C unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} =0V, I_D =-250uA	BV_{DSS}	-20	--	--	V
Gate Threshold Voltage	V_{DS} =V_{GS}, I_D =-250uA	$V_{GS(TH)}$	-0.5	-0.7	-1.0	V
Zero Gate Voltage Drain Current	V_{DS} =-16V, V_{GS} =0V	I_{DSS}	--	--	-1	uA
Gate Body Leakage	V_{GS} =±12V, V_{DS} =0V	I_{GSS}	--	--	±100	nA
On-State Drain Current	V_{DS} =-5V, V_{GS} =-4.5V	$I_{D(ON)}$	-25	--	--	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 =-3A		--	30	42	
	V_{GS} =-1.8V, I_D =-2A		--	45	68	
Forward Transconductance	V_{DS} =-5V, I_D =-4.5A	g_{fs}	--	16	--	S
Diode Forward Voltage	I_S =-0.5A, V_{GS} =0V	V_{SD}	--	- 0.8	-1.3	V
Dynamic[b]						
Total Gate Charge	V_{DS} =-10V, I_D =-4.5A, V_{GS} =-4.5V	Q_g	--	14	20	nC
Gate-Source Charge		Q_{gs}	--	2.1	10	
Gate-Drain Charge		Q_{gd}	--	4.7	--	
Input Capacitance	V_{DS} =-10V, V_{GS} =0V, f =1.0MHz	C_{iss}	--	1500	--	pF
Output Capacitance		C_{oss}	--	220	--	
Reverse Transfer Capacitance		C_{rss}	--	160	--	
Switching[b,C]						
Turn-On Delay Time	V_{DD} =-10V, R_L =10Ω, I_D =-1A, V_{GEN} =-4.5V, R_G =6Ω	$t_{d(on)}$	--	6	11	nS
Turn-On Rise Time		t_r	--	13	23	
Turn-Off Delay Time		$t_{d(off)}$	--	86	145	
Turn-Off Fall Time		t_f	--	42	70	

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



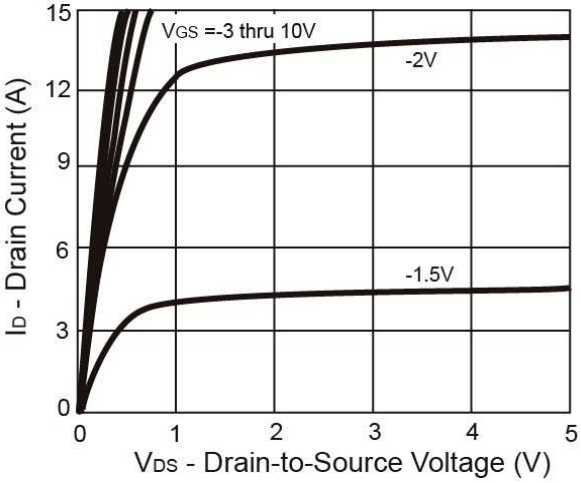
Switching Test Circuit



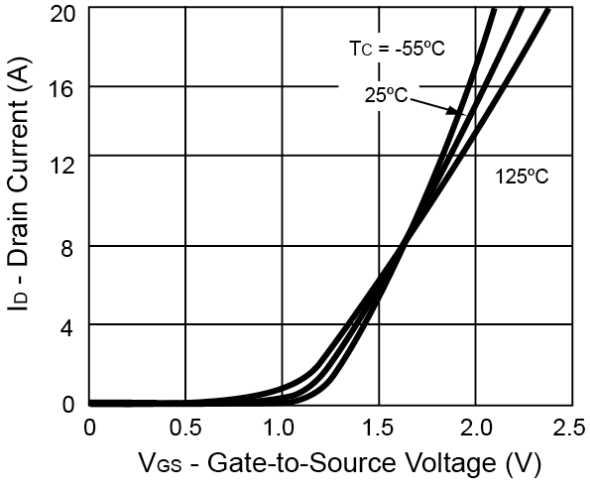
Switchin Waveforms

Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

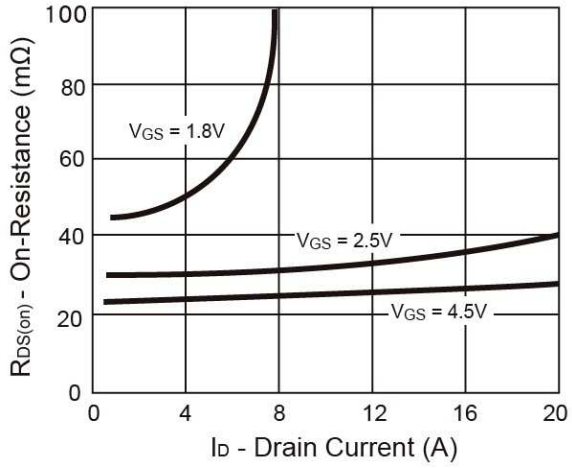
Output Characteristics



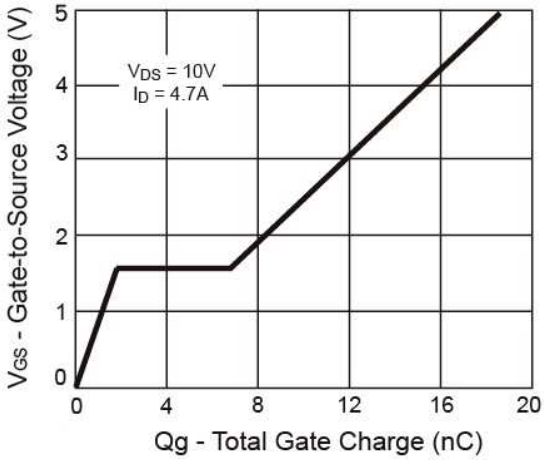
Transfer Characteristics



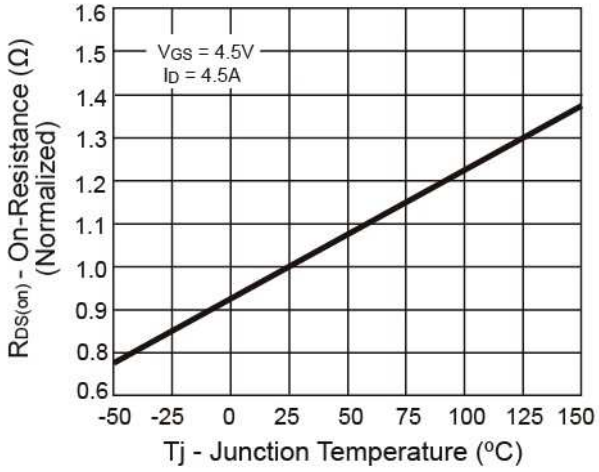
On-Resistance vs. Drain Current



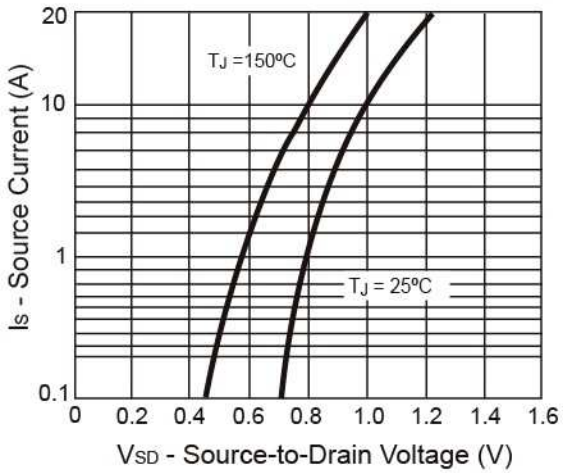
Gate Charge



On-Resistance vs. Junction Temperature

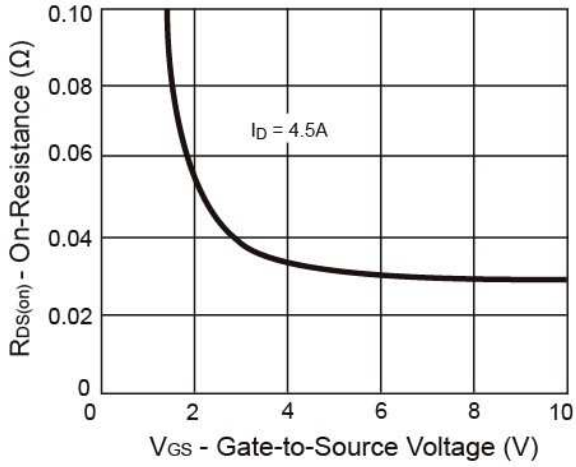


Source-Drain Diode Forward Voltage

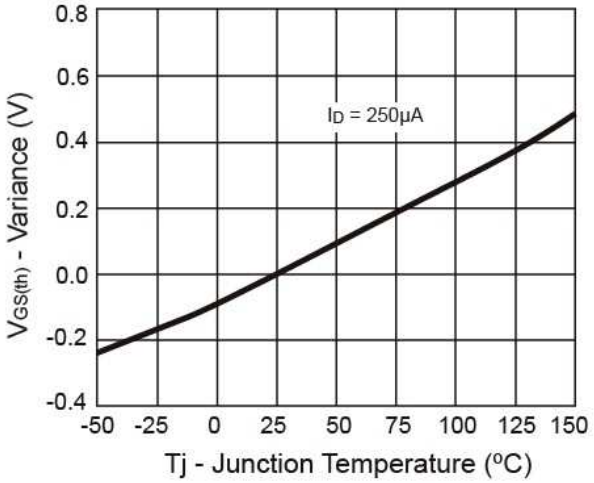


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

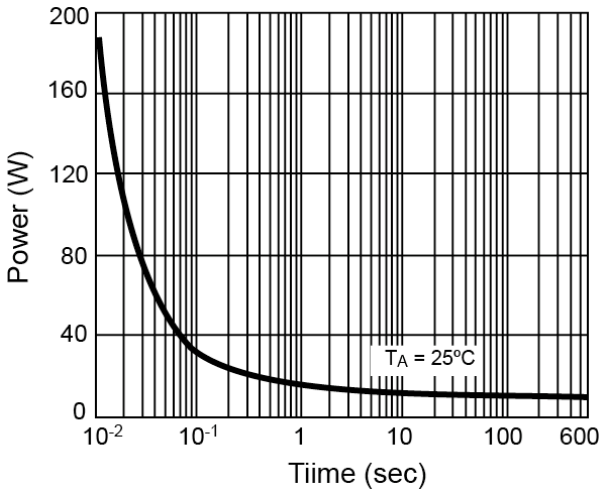
On-Resistance vs. Gate-Source Voltage



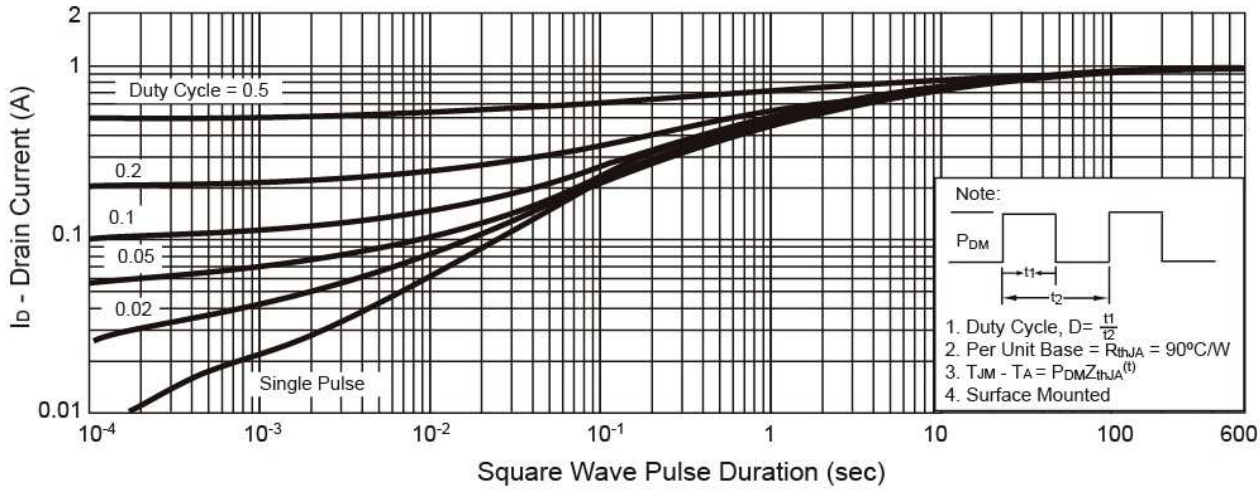
Threshold Voltage



Single Pulse Power

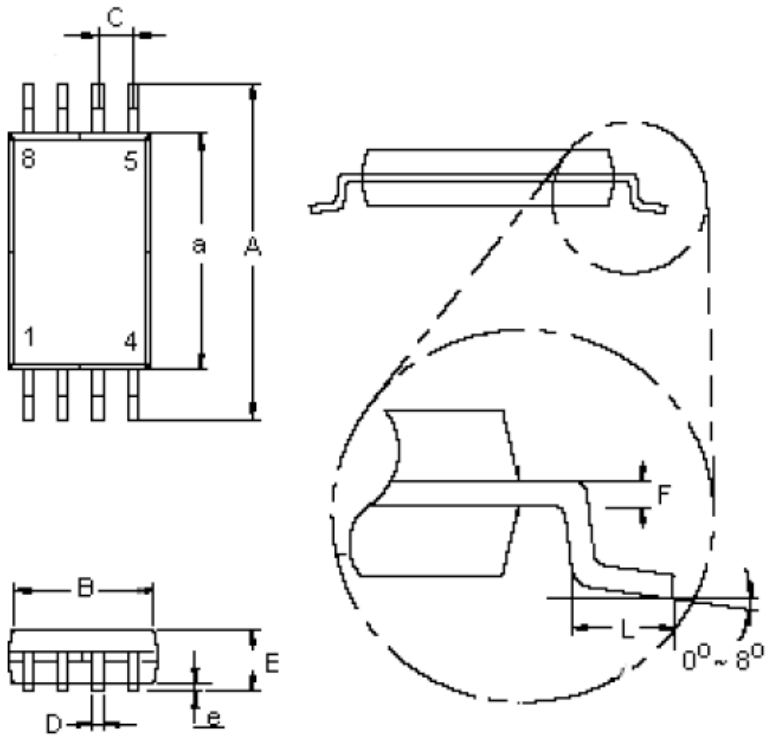


Normalized Thermal Transient Impedance, Junction-to-Ambient



TSM6963SD
20V Dual P-Channel MOSFET

TSSOP-8 Mechanical Drawing



TSSOP-8 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	6.20	6.60	0.244	0.260
a	4.30	4.50	0.170	0.177
B	2.90	3.10	0.114	0.122
C	0.65 (typ)		0.025 (typ)	
D	0.25	0.30	0.010	0.019
E	1.05	1.20	0.041	0.049
e	0.05	0.15	0.002	0.009
F	0.127		0.005	
L	0.50	0.70	0.020	0.028

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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