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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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SOT-23



Pin Definition:

1. Gate
2. Source
3. Drain

Key Parameter Performance

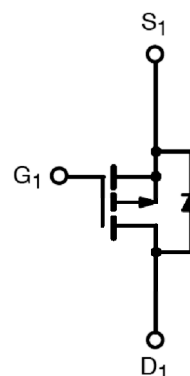
Parameter	Value	Unit
V_{DS}	-60	V
$R_{DS(on)}$ (max)	$V_{GS} = -10V$	190
	$V_{GS} = -4.5V$	240
Q_g	8.2	nC

Ordering Information

Part No.	Package	Packing
TSM2309CX RFG	SOT-23	3kcs / 7_Reel

Note: G_1 denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

Block Diagram



P-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	$T_C = 25^\circ C$	-3.1
		$T_C = 100^\circ C$	-2
Pulsed Drain Current ^(Note 1)	I_{DM}	-12.4	A
Power Dissipation @ $T_C = 25^\circ C$	P_D	1.56	W
Operating Junction Temperature	T_J	50	$^\circ C$
Storage Temperature Range	T_{STG}	-50 to +150	$^\circ C$

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	80	$^\circ C/W$

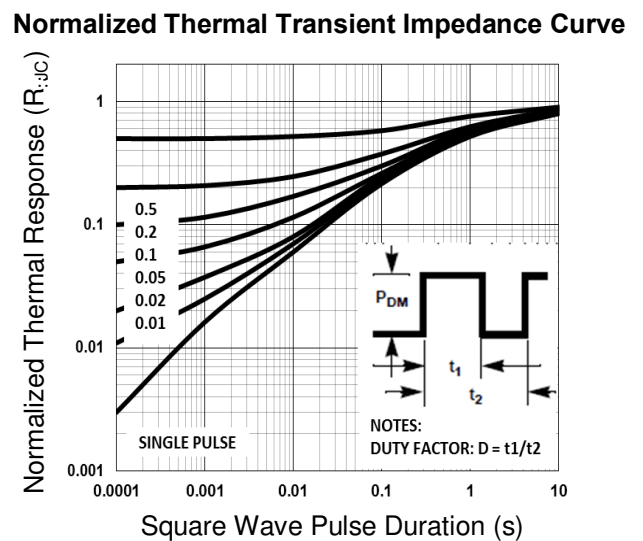
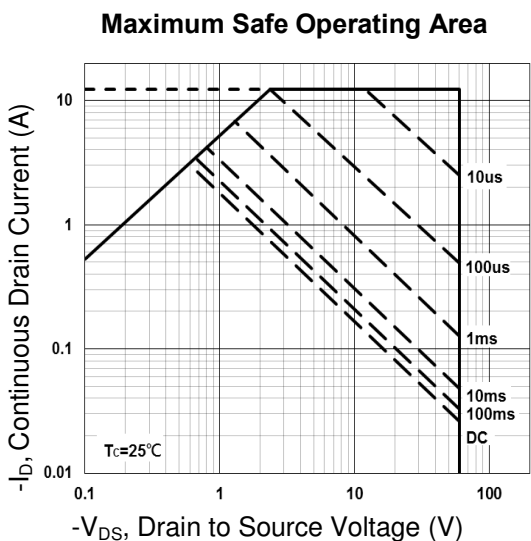
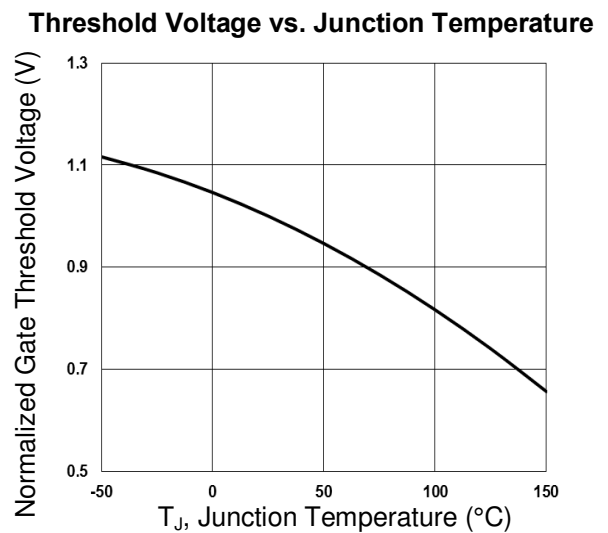
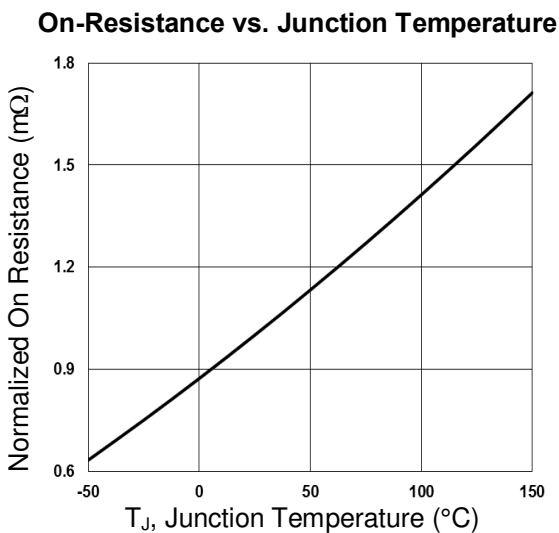
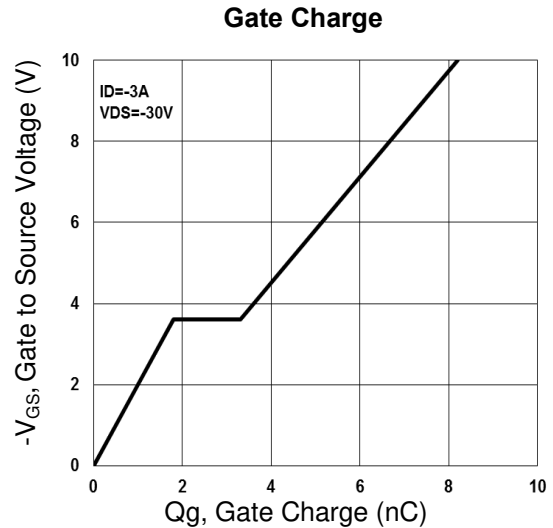
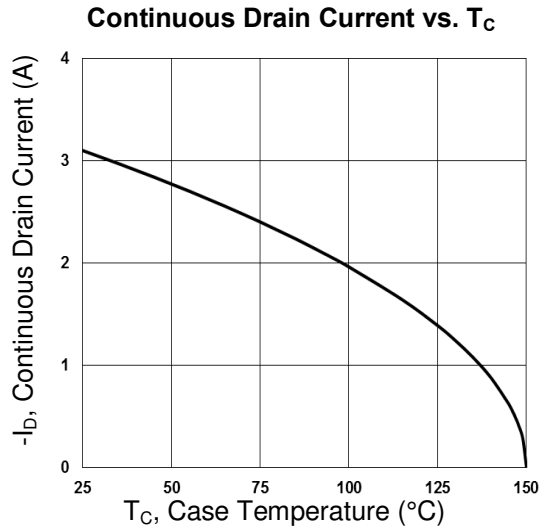
Electrical Specifications ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = -250\mu A$	BV_{DSS}	-60	--	--	V
Drain-Source On-State Resistance	$V_{GS} = -10V, I_D = -3A$	$R_{DS(on)}$	--	160	190	m Ω
	$V_{GS} = -4.5V, I_D = -1.5A$		--	200	240	
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu A$	$V_{GS(TH)}$	-1.2	-1.9	-2.5	V
Zero Gate Voltage Drain Current	$V_{DS} = -60V, V_{GS} = 0V$	I_{DSS}	--	--	-1	μA
	$V_{DS} = -48V, T_J = 125^\circ C$		--	--	-10	
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 100	nA
Forward Transconductance	$V_{DS} = -10V, I_D = -3A$	g_{fs}	--	3.5	--	S
Dynamic						
Total Gate Charge ^(Note 2,3)	$V_{DS} = -30V, I_D = -3A,$ $V_{GS} = -10V$	Q_g	--	8.2	--	nC
Gate-Source Charge ^(Note 2,3)		Q_{gs}	--	1.8	--	
Gate-Drain Charge ^(Note 2,3)		Q_{gd}	--	1.5	--	
Input Capacitance	$V_{DS} = -30V, V_{GS} = 0V,$ $f = 1.0MHz$	C_{iss}	--	425	--	pF
Output Capacitance		C_{oss}	--	35	--	
Reverse Transfer Capacitance		C_{rss}	--	20	--	
Switching						
Turn-On Delay Time ^(Note 2,3)	$V_{DD} = -30V, I_D = -1A,$ $V_{GS} = -10V, R_{GEN} = 6\Omega$	$t_{d(on)}$	--	5.2	--	ns
Turn-On Rise Time ^(Note 2,3)		t_r	--	19	--	
Turn-Off Delay Time ^(Note 2,3)		$t_{d(off)}$	--	35	--	
Turn-Off Fall Time ^(Note 2,3)		t_f	--	10.6	--	
Source-Drain Diode Ratings and Characteristic						
Maximum Continuous Drain-Source Diode Forward Current	Integral reverse diode in the MOSFET	I_S	--	--	-3.1	A
Maximum Pulse Drain-Source Diode Forward Current		I_{SM}	--	--	-12.4	A
Diode-Source Forward Voltage	$V_{GS} = 0V, I_S = -1A$	V_{SD}	--	--	-1	V

Note:

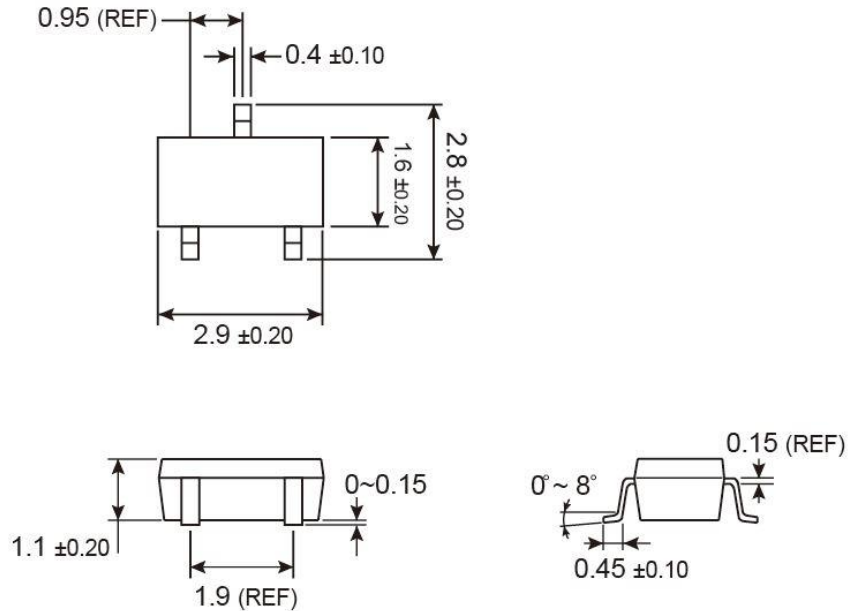
- Pulse width limited by safe operating area
- Pulse test: pulse width $\neq 300\mu s$, duty cycle $\neq 2\%$
- Switching time is essentially independent of operating temperature.

Electrical Characteristics Curve



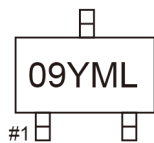


SOT-23 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- 09** = Device Code
- 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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