



**THE DATASHEET OF
TSM2307CX RFG**



SOT-23



Pin Definition:

1. Gate
2. Source
3. Drain

Key Parameter Performance

Parameter	Value	Unit
V_{DS}	-30	V
$R_{DS(on)}$ (max)	$V_{GS} = -10V$	95
	$V_{GS} = -4.5V$	140
Q_g	10	nC

Features

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

Application

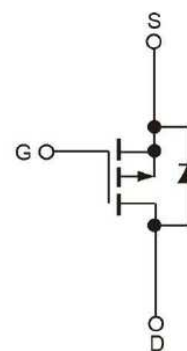
- Load Switch
- PA Switch

Ordering Information

Part No.	Package	Packing
TSM2307CX RFG	SOT-23	3kpcs / 7" 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

Block Diagram



P-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^(Note 1)	I_D	-3	A
Pulsed Drain Current ^(Note 2)	I_{DM}	-20	A
Continuous Source Current (Diode Conduction)	I_S	-1.7	A
Power Dissipation	P_D	$T_a = 25^\circ\text{C}$	1.25
		$T_a = 75^\circ\text{C}$	0.8
Operating Junction Temperature	T_J	+150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-50 to +150	$^\circ\text{C}$

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance - Junction to Case	$R_{\theta JC}$	75	$^{\circ}\text{C/W}$
Thermal Resistance - Junction to Ambient	$R_{\theta JA}$	130	$^{\circ}\text{C/W}$

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

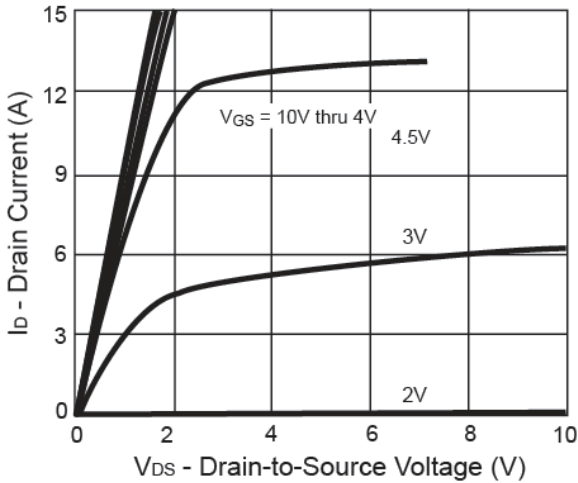
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}, I_D = -250\mu\text{A}$	BV_{DSS}	-30	--	--	V
Drain-Source On-State Resistance	$V_{GS} = -10\text{V}, I_D = -3\text{A}$	$R_{DS(ON)}$	--	76	95	m Ω
	$V_{GS} = -4.5\text{V}, I_D = -2\text{A}$		--	103	140	m Ω
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = -250\mu\text{A}$	$V_{GS(TH)}$	-1	--	-3	V
Zero Gate Voltage Drain Current	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}$	I_{DSS}	--	--	-1.0	μA
Gate Body Leakage	$V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$	I_{GSS}	--	--	± 100	nA
Forward Transconductance (Note 4)	$V_{DS} = -10\text{V}, I_D = -6\text{A}$	g_{fs}	--	5	--	S
Diode Forward Voltage	$I_S = -1.7\text{V}, V_{GS} = 0\text{V}$	V_{SD}			-1.2	V
Dynamic						
Total Gate Charge (Note 3,4)	$V_{DS} = -15\text{V}, I_D = -3\text{A}, V_{GS} = -10\text{V}$	Q_g	--	10	15	nC
Gate-Source Charge (Note 3,4)		Q_{gs}	--	1.9	--	
Gate-Drain Charge (Note 3,4)		Q_{gd}	--	2	--	
Input Capacitance	$V_{DS} = -30\text{V}, V_{GS} = 0\text{V}, f = 1.0\text{MHz}$	C_{iss}	--	565	--	pF
Output Capacitance		C_{oss}	--	126	--	
Reverse Transfer Capacitance		C_{rss}	--	75	--	
Switching						
Turn-On Delay Time (Note 3,4)	$V_{DD} = -15\text{V}, R_L = 15\Omega, I_D = -1\text{A}, V_{GEN} = -10\text{V}, R_G = 6\Omega$	$t_{d(on)}$	--	10	20	ns
Turn-On Rise Time (Note 3,4)		t_r	--	9	20	
Turn-Off Delay Time (Note 3,4)		$t_{d(off)}$	--	27	50	
Turn-Off Fall Time (Note 3,4)		t_f	--	7	16	

Note:

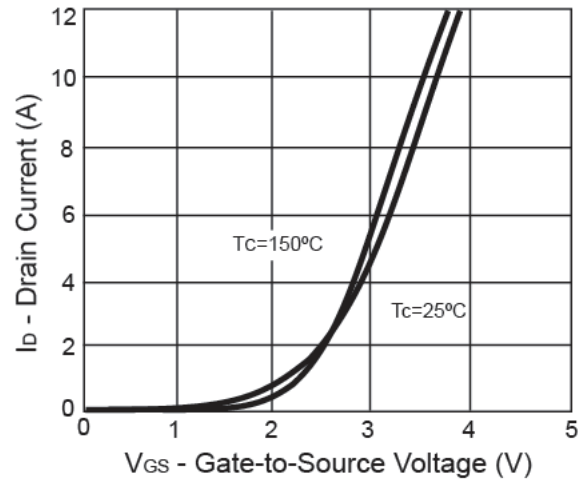
- Limited by maximum junction temperature
- Pulse width limited by safe operating area
- Pulse test: pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- Switching time is essentially independent of operating temperature.

Electrical Characteristics Curve

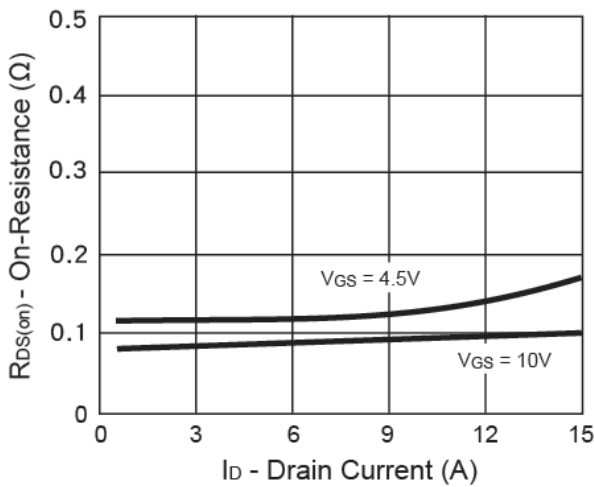
Output Characteristics



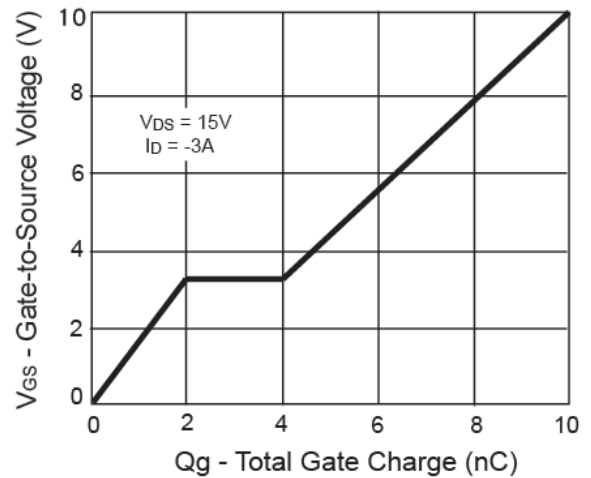
Transfer Characteristics



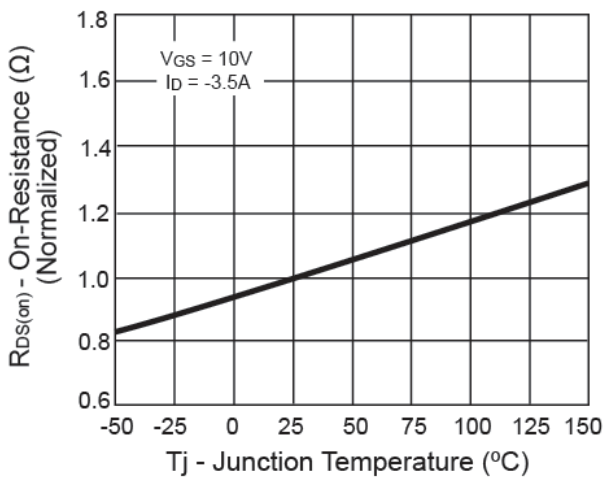
On-Resistance vs. Drain Current



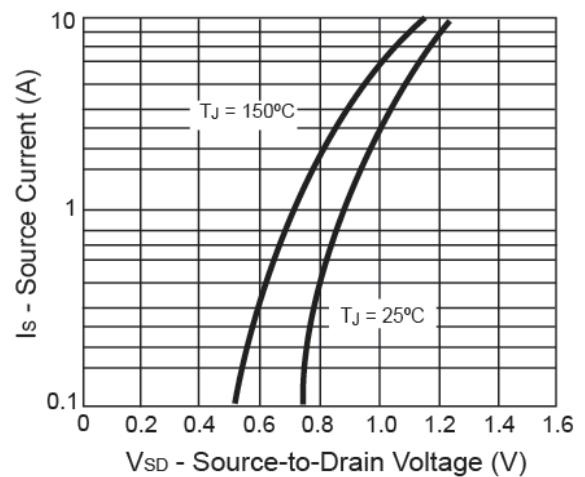
Gate Charge



On-Resistance vs. Junction Temperature

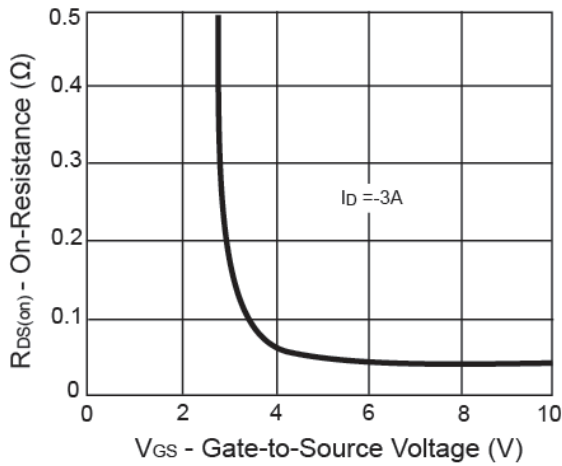


Source-Drain Diode Forward Voltage

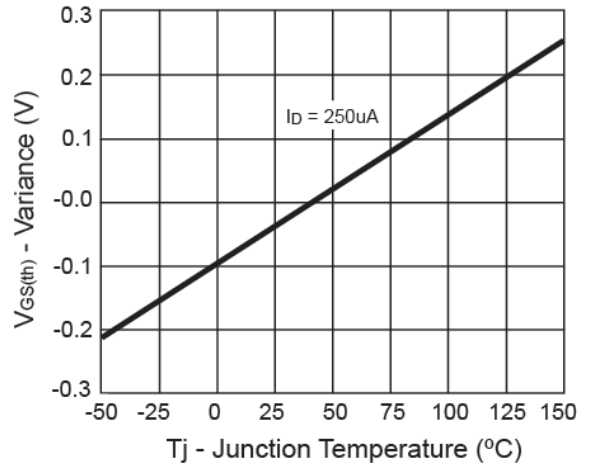


Electrical Characteristics Curve

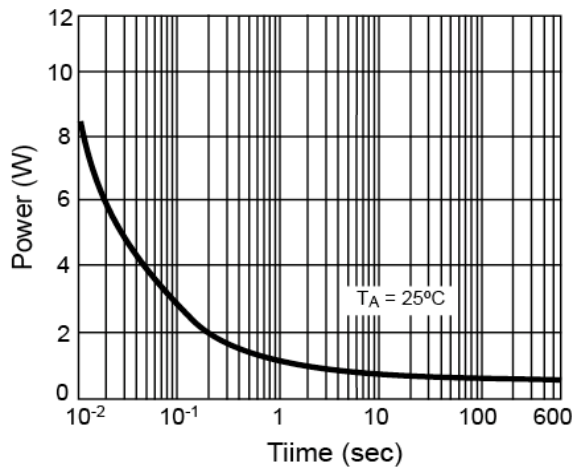
On-Resistance vs. Gate-Source Voltage



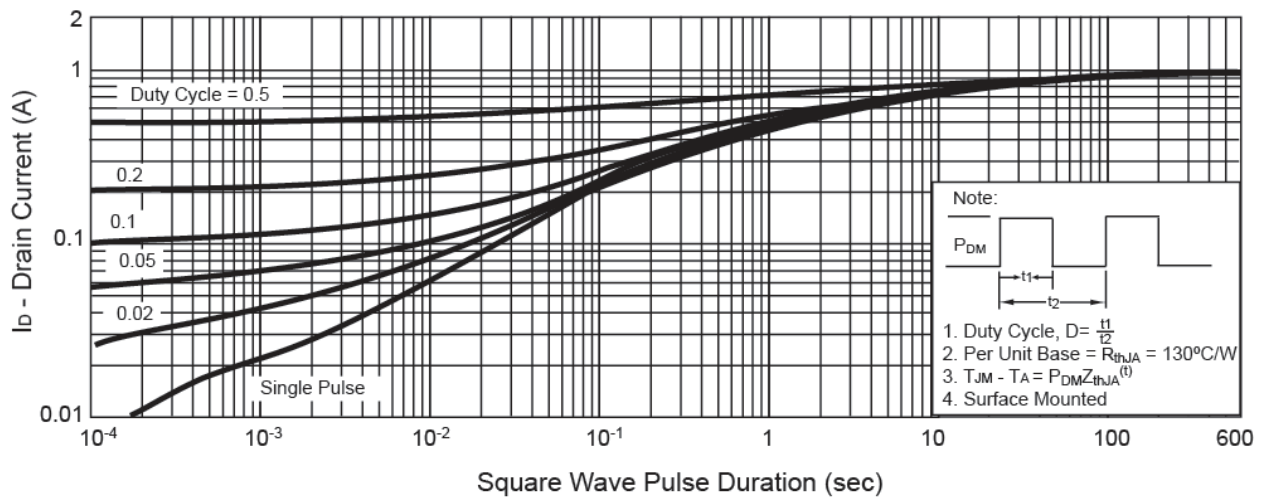
Threshold Voltage



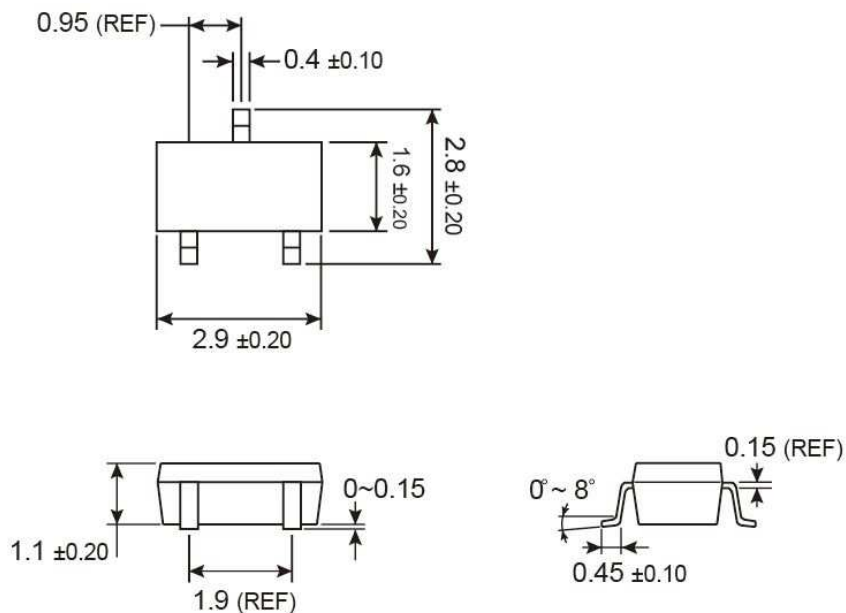
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

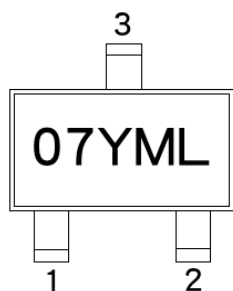


SOT-23 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- 07** = 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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