



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

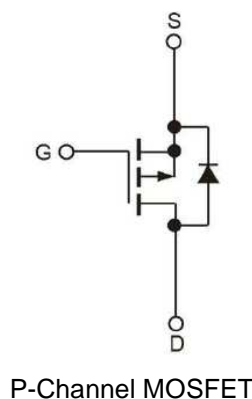
- Load Switch
- PA Switch

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



Absolute Maximum Ratings ($T_C = 25^\circ C$ 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	$T_a = 25^\circ C$	1.25
		$T_a = 75^\circ C$	0.8
Operating Junction Temperature	T_J	+150	$^\circ C$
Storage Temperature Range	T_{STG}	-50 to +150	$^\circ C$



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	

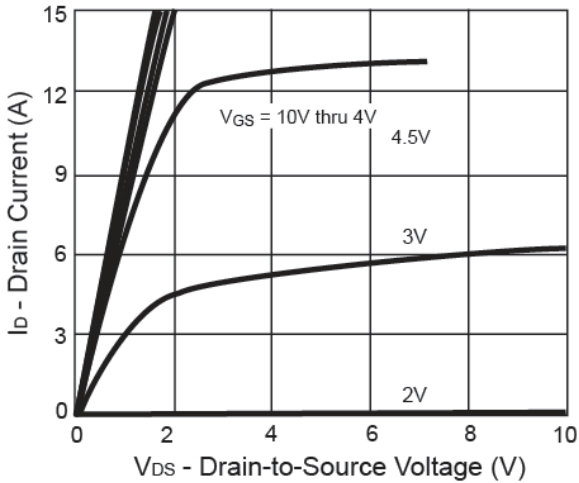
Note:

- 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.

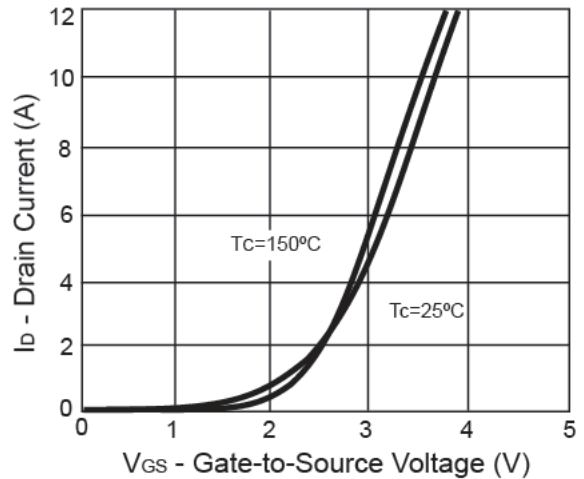


Electrical Characteristics Curve

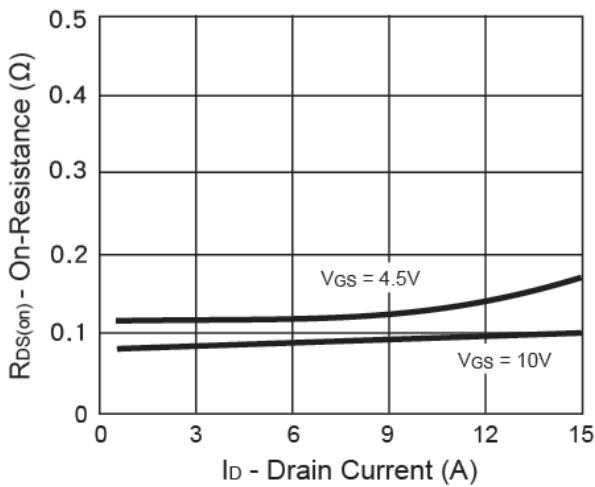
Output Characteristics



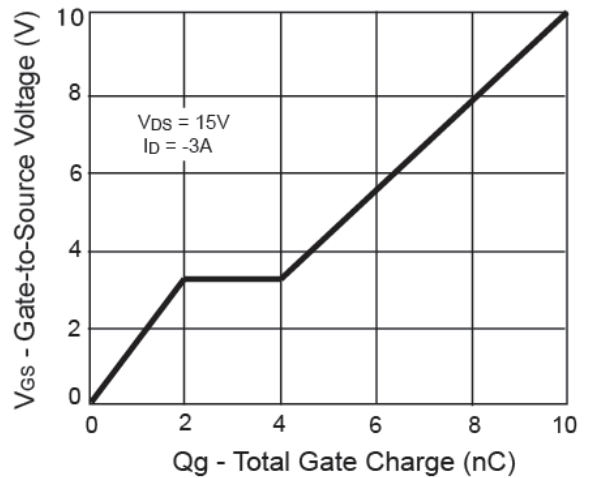
Transfer Characteristics



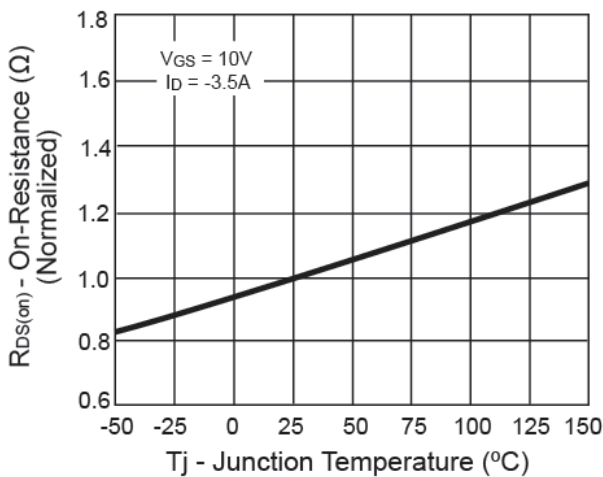
On-Resistance vs. Drain Current



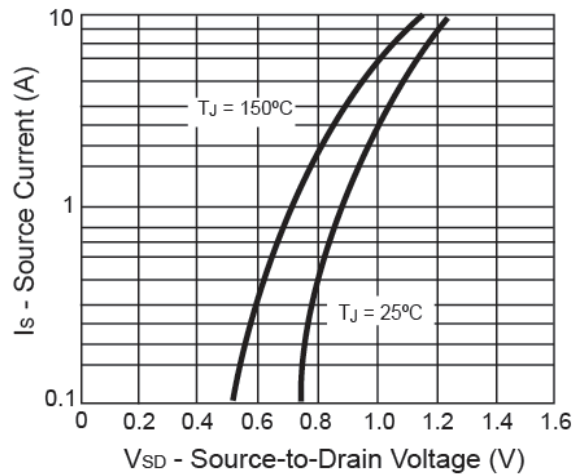
Gate Charge



On-Resistance vs. Junction Temperature



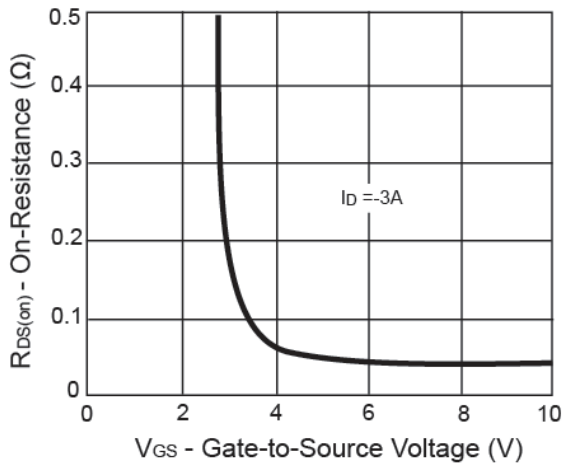
Source-Drain Diode Forward Voltage



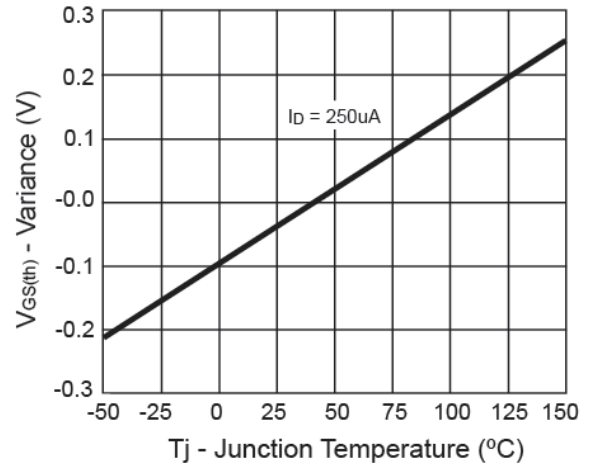


Electrical Characteristics Curve

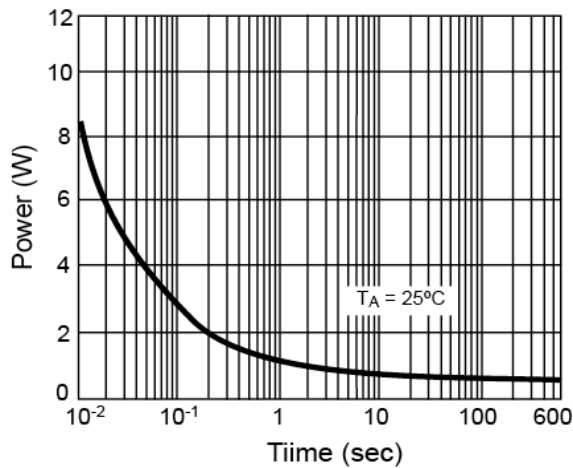
On-Resistance vs. Gate-Source Voltage



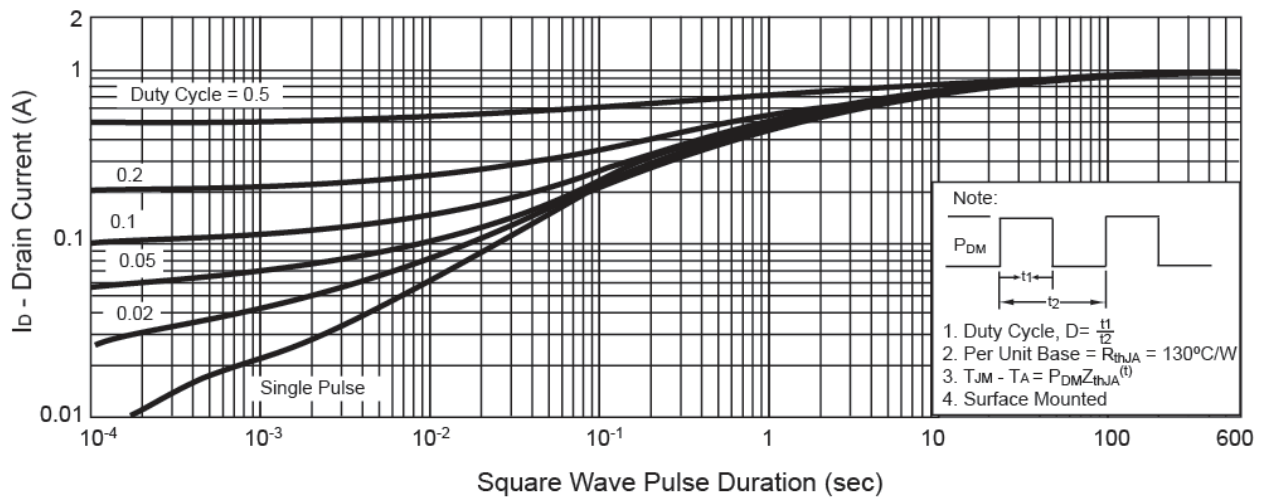
Threshold Voltage



Single Pulse Power

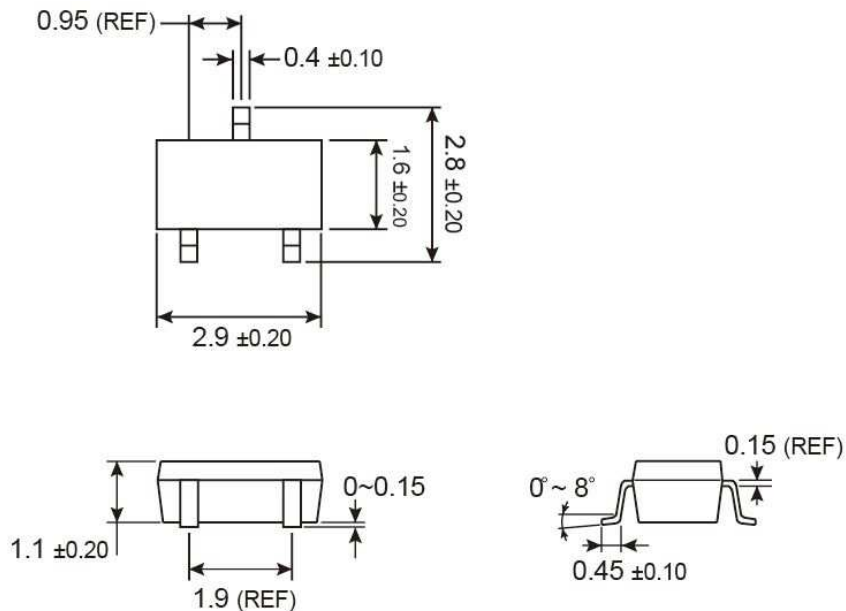


Normalized Thermal Transient Impedance, Junction-to-Ambient



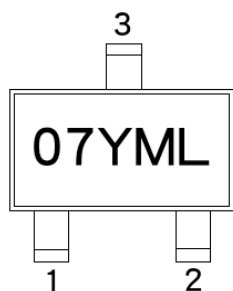


SOT-23 Mechanical Drawing



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

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.