

SOT-23

Pin Definition:

1. Gate
2. Source
3. Drain

PRODUCT SUMMARY

V_{DS} (V)	R_{DS(on)}(mΩ)	I_D (A)
-20	55 @ V _{GS} = -4.5V	-4.0
	85 @ V _{GS} = -2.5V	-2.5

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
TSM2311CX RF	SOT-23	3Kpcs / 7" Reel

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

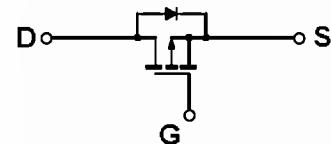
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±8	V
Continuous Drain Current, V _{GS} @4.5V.	I _D	-4	A
Pulsed Drain Current, V _{GS} @4.5V	I _{DM}	-20	A
Continuous Source Current (Diode Conduction) ^{a,b}	I _S	-0.72	A
Maximum Power Dissipation	P _D	0.9	W
		0.57	
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
Lead Temperature (1/8" from case)	T _L	5	S
Junction to Ambient Thermal Resistance (PCB mounted)	R _{θ_{JA}}	250	°C/W

Notes:

- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, t ≤ 5 sec.
- c. Surface Mounted on FR4 Board,

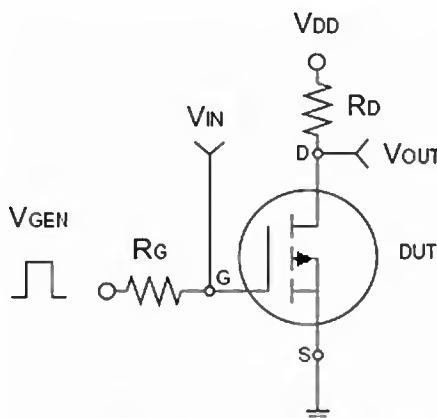
Block Diagram

P-Channel MOSFET

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

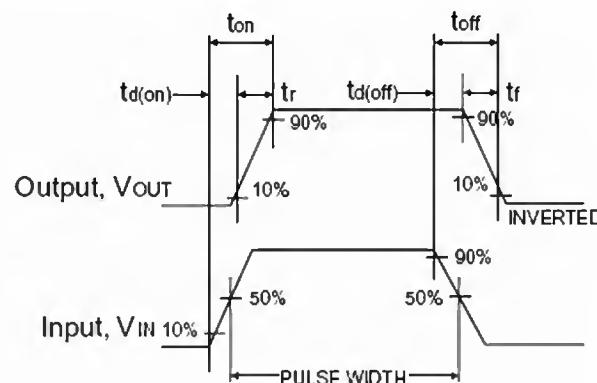
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0\text{V}$, $I_D = -250\mu\text{A}$	BV_{DSS}	-20	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$	$V_{GS(\text{TH})}$	-0.45	--	-0.95	V
Gate Body Leakage	$V_{GS} = \pm 8\text{V}$, $V_{DS} = 0\text{V}$	I_{GSS}	--	--	± 100	nA
Zero Gate Voltage Drain Current	$V_{DS} = -16\text{V}$, $V_{GS} = 0\text{V}$	I_{DSS}	--	--	-1.0	μA
On-State Drain Current ^a	$V_{DS} \geq -10\text{V}$, $V_{GS} = -5\text{V}$	$I_{D(\text{ON})}$	-6	--	--	A
Drain-Source On-State Resistance ^a	$V_{GS} = -4.5\text{V}$, $I_D = -4\text{A}$	$R_{DS(\text{ON})}$	--	45	55	$\text{m}\Omega$
	$V_{GS} = -2.5\text{V}$, $I_D = -2.5\text{A}$		--	75	85	
Forward Transconductance ^a	$V_{DS} = -5\text{V}$, $I_D = -4\text{A}$	g_{fs}	--	9	--	S
Diode Forward Voltage	$I_S = -0.75\text{A}$, $V_{GS} = 0\text{V}$	V_{SD}	--	- 0.8	-1.2	V
Dynamic^b						
Total Gate Charge	$V_{DS} = -6\text{V}$, $I_D = -4\text{A}$, $V_{GS} = -4.5\text{V}$	Q_g	--	6	9	nC
Gate-Source Charge		Q_{gs}	--	1.4	--	
Gate-Drain Charge		Q_{gd}	--	1.9	--	
Input Capacitance	$V_{DS} = -6\text{V}$, $V_{GS} = 0\text{V}$, $f = 1.0\text{MHz}$	C_{iss}	--	640	--	pF
Output Capacitance		C_{oss}	--	180	--	
Reverse Transfer Capacitance		C_{rss}	--	90	--	
Switching^c						
Turn-On Delay Time	$V_{DD} = -6\text{V}$, $R_L = 6\Omega$, $I_D = -1\text{A}$, $V_{GEN} = -4.5\text{V}$, $R_G = 6\Omega$	$t_{d(on)}$	--	22	35	nS
Turn-On Rise Time		t_r	--	35	55	
Turn-Off Delay Time		$t_{d(off)}$	--	45	70	
Turn-Off Fall Time		t_f	--	25	50	

Notes:

- pulse test: $PW \leq 300\mu\text{S}$, duty cycle $\leq 2\%$
- For DESIGN AID ONLY, not subject to production testing.
- Switching time is essentially independent of operating temperature.

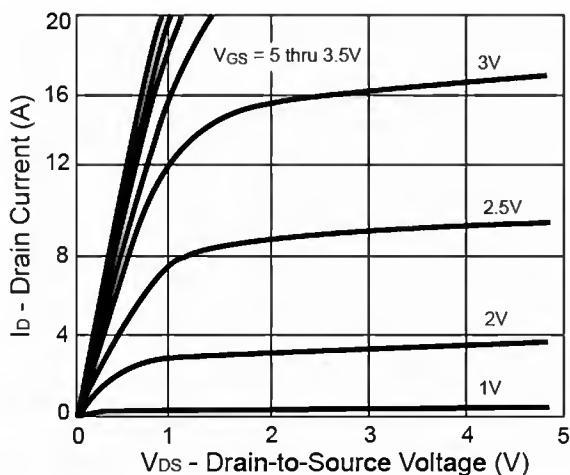
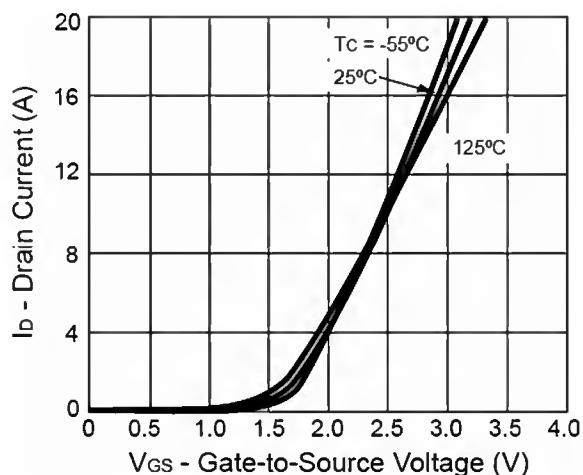
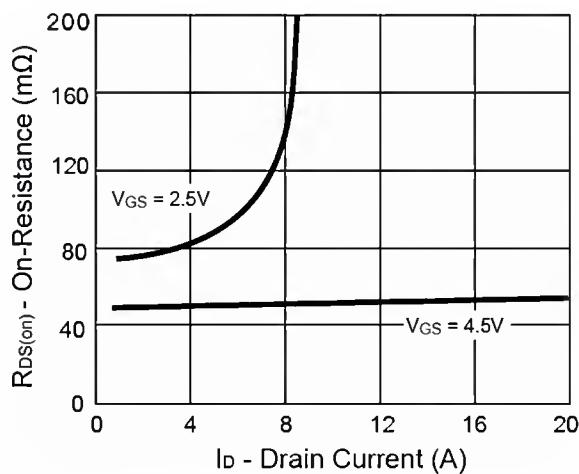
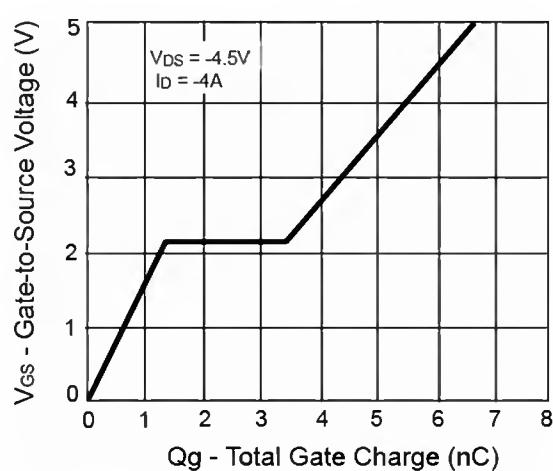
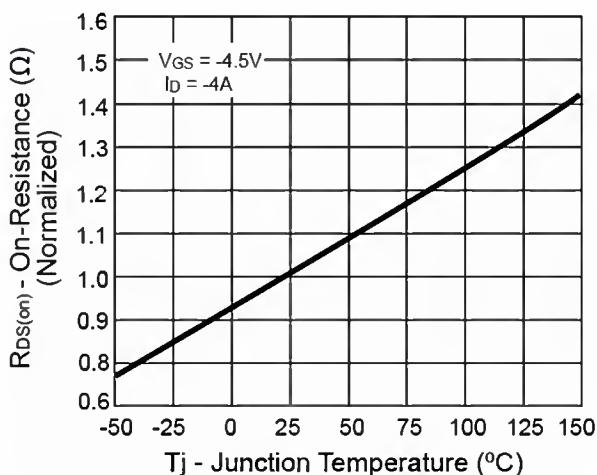
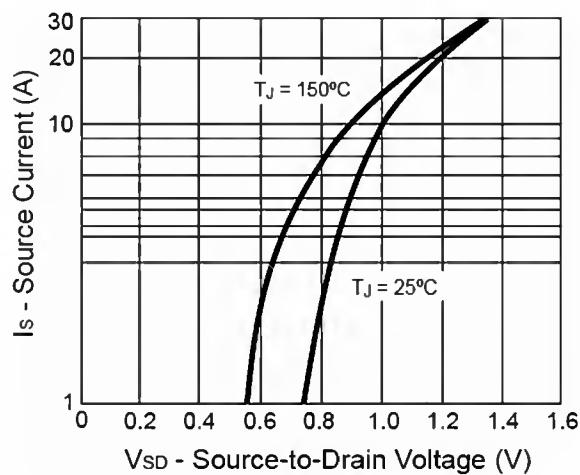


Switching Test Circuit

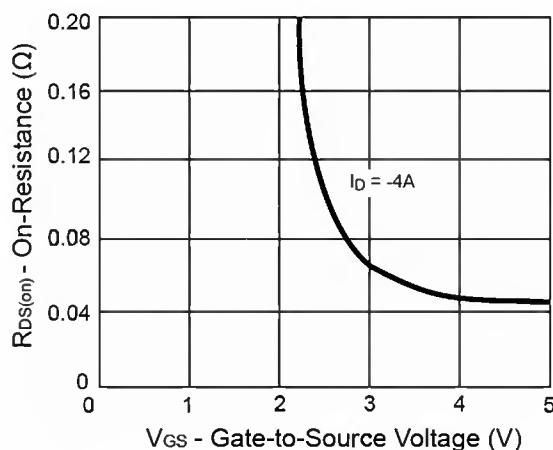
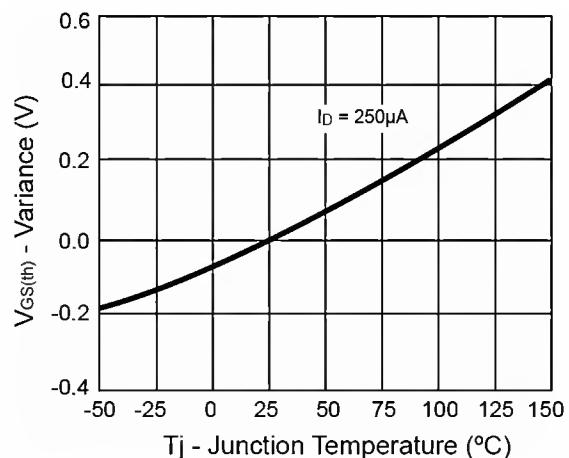
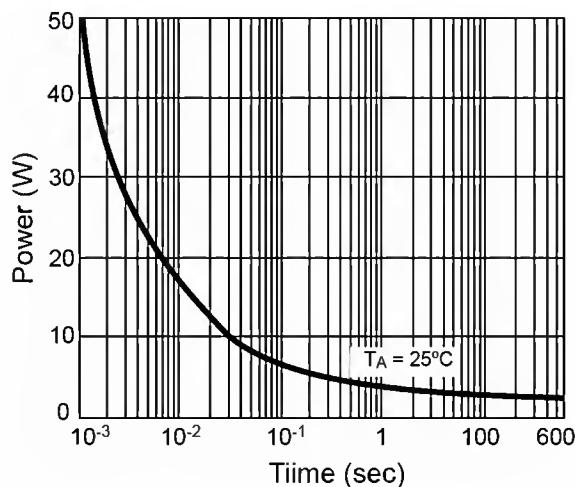
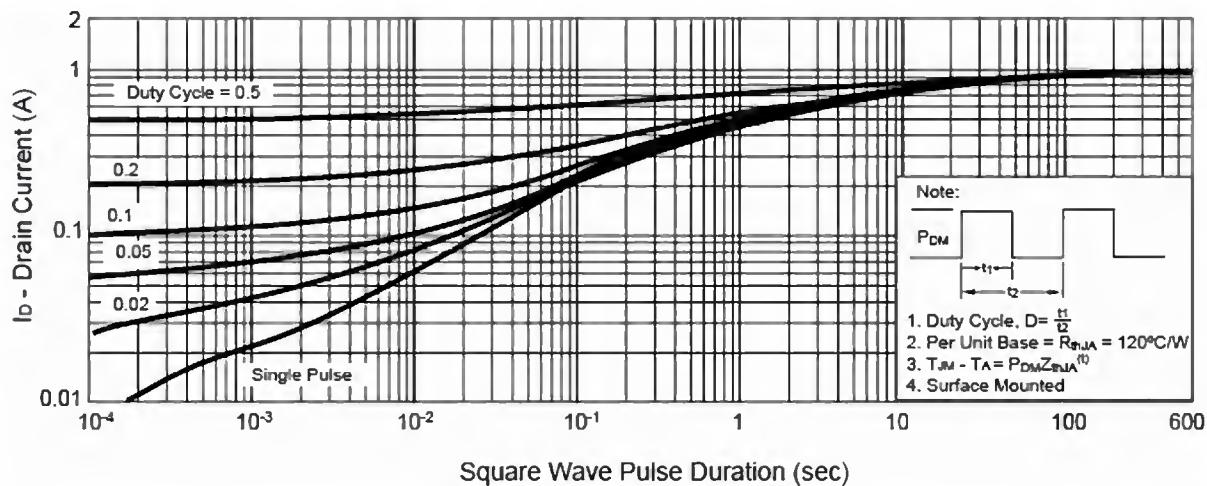


Switching Waveforms

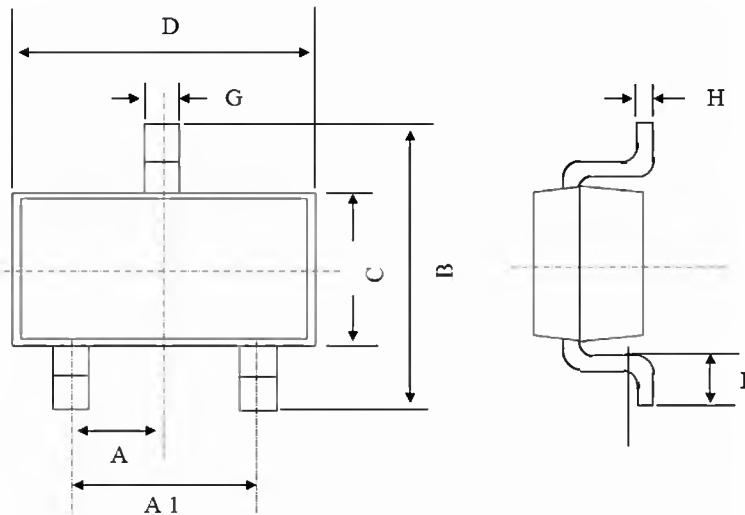
Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

Output Characteristics

Transfer Characteristics

On-Resistance vs. Drain Current

Gate Charge

On-Resistance vs. Junction Temperature

Source-Drain Diode Forward Voltage


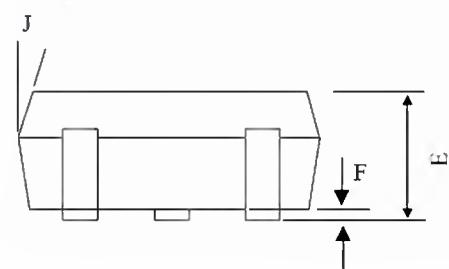
Electrical Characteristics Curve ($T_A = 25^\circ\text{C}$, unless otherwise noted)

On-Resistance vs. Gate-Source Voltage

Threshold Voltage

Single Pulse Power

Normalized Thermal Transient Impedance, Junction-to-Ambient


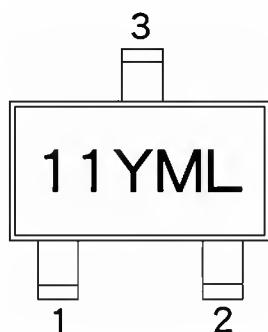
SOT-23 Mechanical Drawing



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.95 BSC		0.037 BSC	
A1	1.9 BSC		0.074 BSC	
B	2.60	3.00	0.102	0.118
C	1.40	1.70	0.055	0.067
D	2.80	3.10	0.110	0.122
E	1.00	1.30	0.039	0.051
F	0.00	0.10	0.000	0.004
G	0.35	0.50	0.014	0.020
H	0.10	0.20	0.004	0.008
I	0.30	0.60	0.012	0.024
J	5°	10°	5°	10°



Marking Diagram



11 = Device Code
Y = Year Code
M = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apl, E=May, F=Jun, G=Jul, H=Aug,
 I=Sep, J=Oct, K=Nov, L=Dec)
L = Lot Code

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