

SOT-23

Pin Definition:

1. Gate
2. Source
3. Drain

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (m Ω)	I_D (A)
30	57 @ $V_{GS}=10V$	3.5
	94 @ $V_{GS}=4.5V$	2.8

Features

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

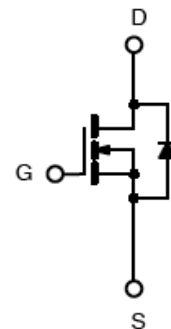
Application

- Load Switch
- PA Switch

Ordering Information

Part No.	Package	Packing
TSM2306CX RFG	SOT-23	3Kpcs / 7" Reel

Note: "G" denote for Green Product

Block Diagram


N-Channel MOSFET

Absolute Maximum Rating ($T_a = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	3.5	A
Pulsed Drain Current	I_{DM}	± 20	A
Continuous Source Current (Diode Conduction) ^{a,b}	I_S	1.7	A
Maximum Power Dissipation	P_D	$T_a = 25^\circ C$	1.25
		$T_a = 75^\circ C$	0.8
Operating Junction Temperature	T_J	+150	$^\circ C$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to +150	$^\circ C$

Thermal Performance

Parameter	Symbol	Limit	Unit
Junction to Case Thermal Resistance	$R_{\theta_{JC}}$	75	$^\circ C/W$
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta_{JA}}$	130	$^\circ C/W$

Notes:

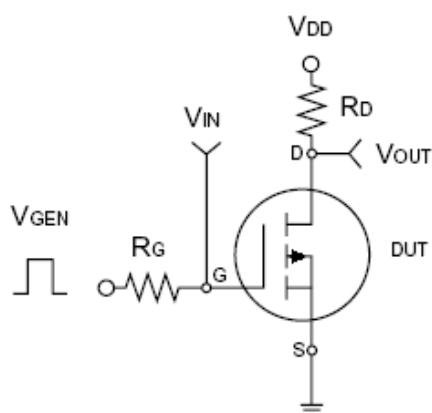
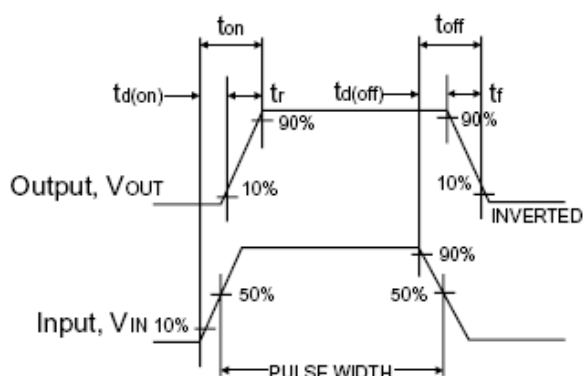
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 5$ sec.

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 = 250μA	BV _{DSS}	30	--	--	V
Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	V _{GS(TH)}	1	--	3	V
Gate Body Leakage	V _{GS} = ±20V, V _{DS} = 0V	I _{GSS}	--	--	±100	nA
Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	I _{DSS}	--	--	1.0	μA
On-State Drain Current	V _{DS} ≥ 4.5V, V _{GS} = 10V	I _{D(ON)}	6	--	--	A
Drain-Source On-State Resistance	V _{GS} = 10V, I _D = 3.5A	R _{DS(ON)}	--	46	57	mΩ
	V _{GS} = 4.5V, I _D = 2.8A		--	70	94	
Forward Transconductance	V _{DS} = 15V, I _D = 3.5A	g _{fs}	--	11	--	S
Diode Forward Voltage	I _S = 1.7A, V _{GS} = 0V	V _{SD}	--	--	1.2	V
Dynamic^b						
Total Gate Charge	V _{DS} = 15V, I _D = 3.5A, V _{GS} = 10V	Q _g	--	4.2	7	nC
Gate-Source Charge		Q _{gs}	--	1.9	--	
Gate-Drain Charge		Q _{gd}	--	1.35	--	
Input Capacitance	V _{DS} = 15V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	555	--	pF
Output Capacitance		C _{oss}	--	120	--	
Reverse Transfer Capacitance		C _{rss}	--	60	--	
Switching^c						
Turn-On Delay Time	V _{DD} = 15V, R _L = 15Ω, I _D = 1A, V _{GEN} = 10V, R _G = 6Ω	t _{d(on)}	--	4.2	5.5	nS
Turn-On Rise Time		t _r	--	19	25	
Turn-Off Delay Time		t _{d(off)}	--	13	17	
Turn-Off Fall Time		t _f	--	9	12	

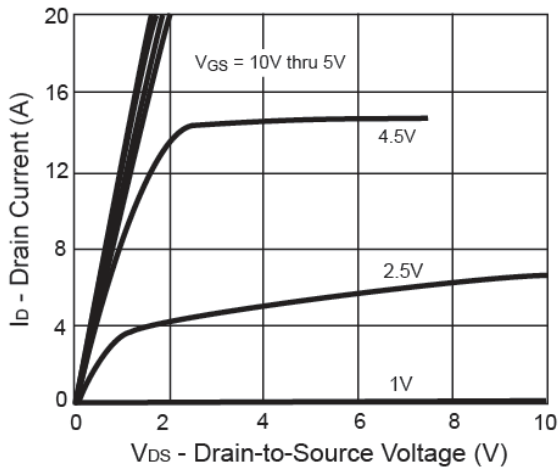
Notes:

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

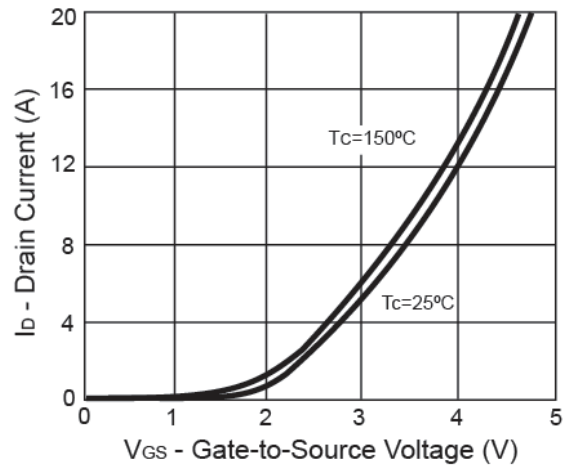

Switching Test Circuit

Switchin Waveforms

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

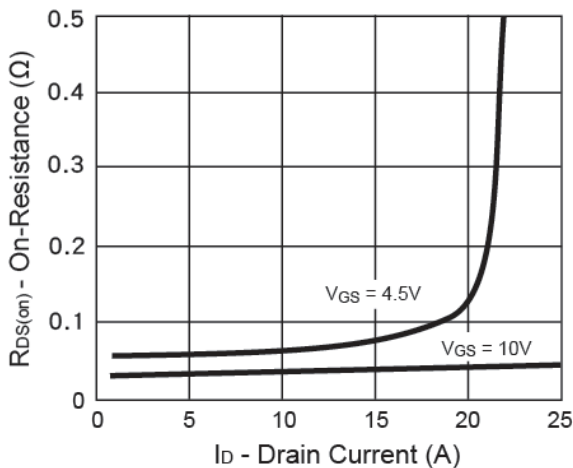
Output Characteristics



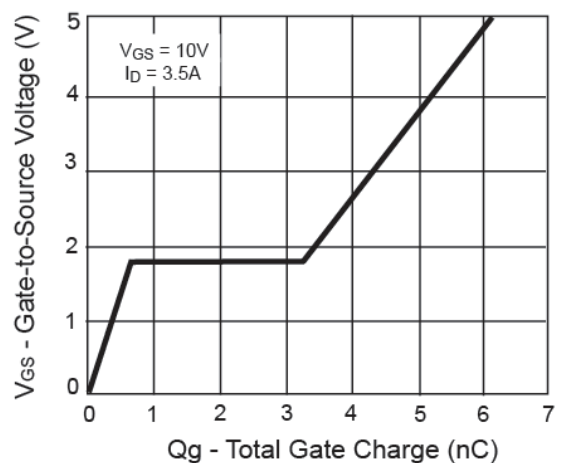
Transfer Characteristics



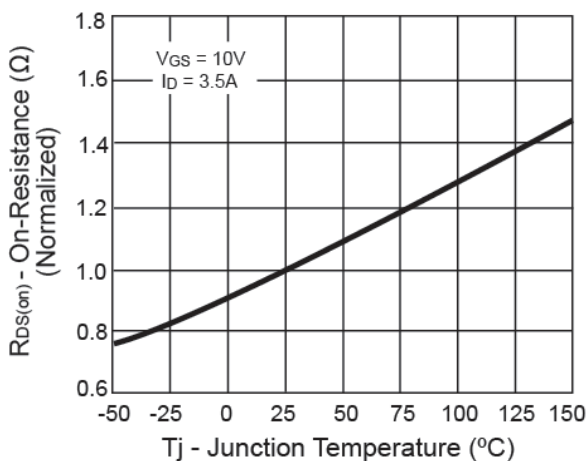
On-Resistance vs. Drain Current



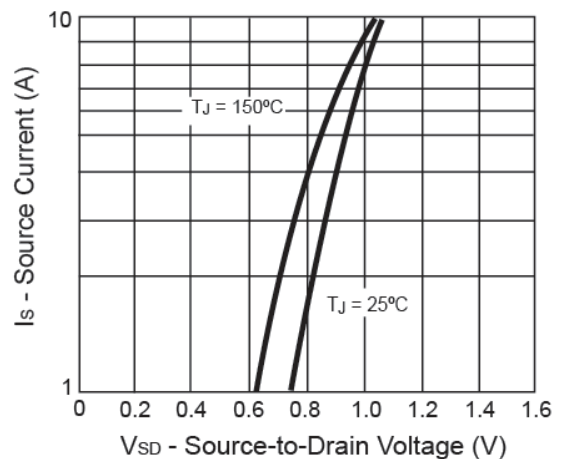
Gate Charge



On-Resistance vs. Junction Temperature

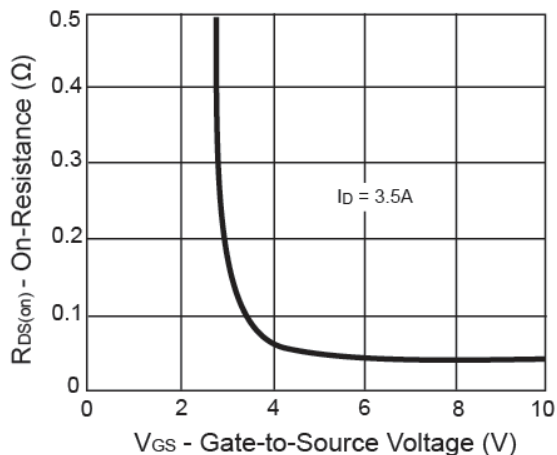


Source-Drain Diode Forward Voltage

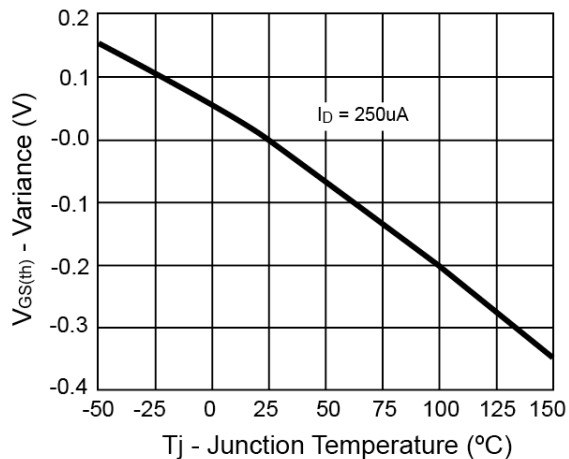


Electrical Characteristics Curve (Ta = 25°C, unless otherwise noted)

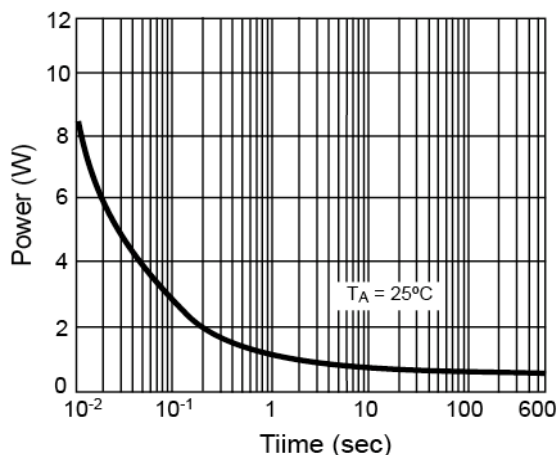
On-Resistance vs. Gate-Source Voltage



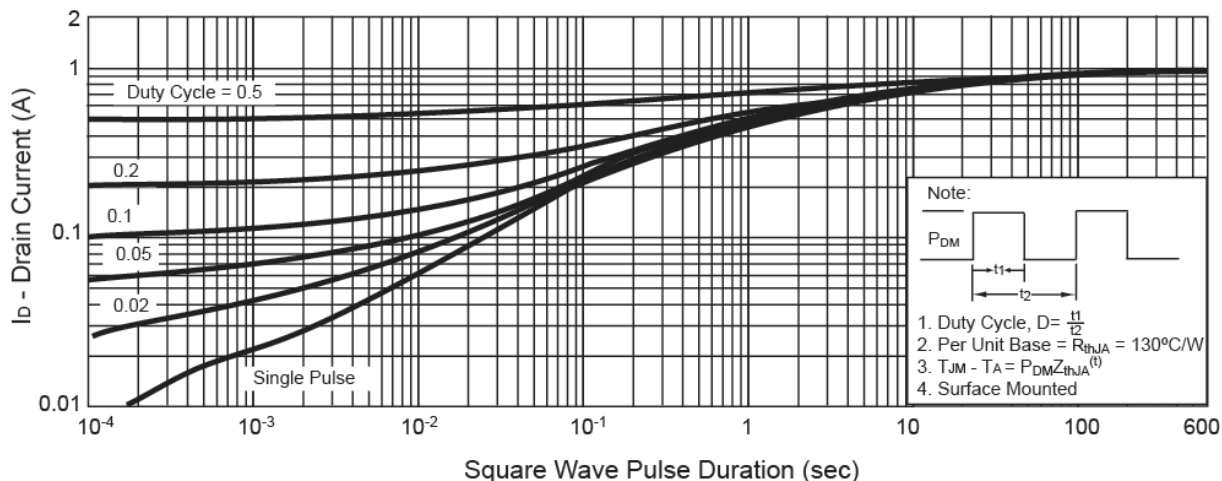
Threshold Voltage



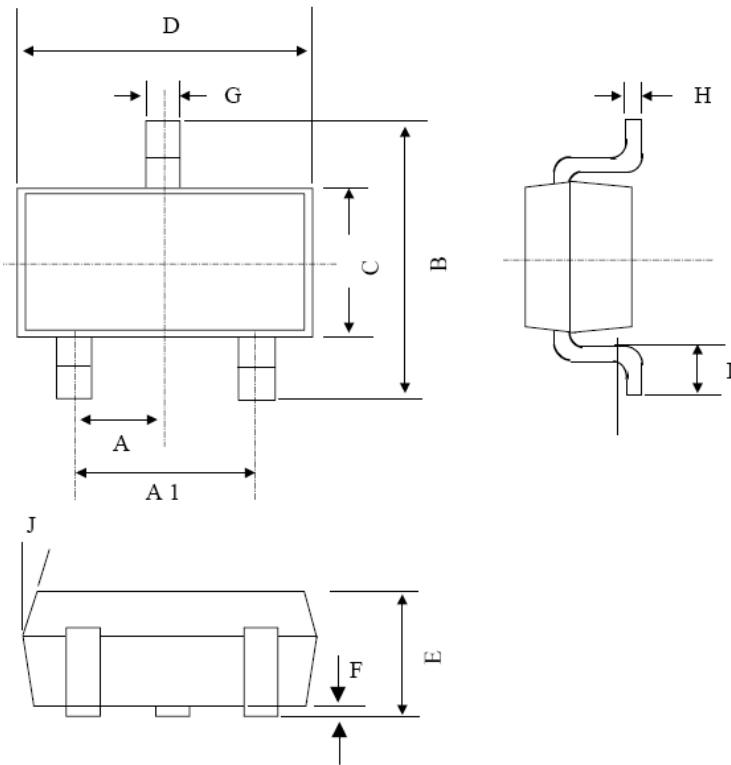
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

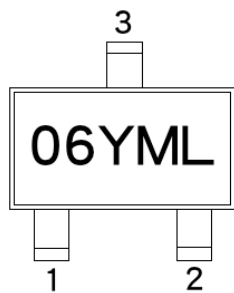


SOT-23 Mechanical Drawing



SOT-23 DIMENSION				
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



- 06** = 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



TSM2306

30V N-Channel MOSFET

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