

SOT-23

SOT-323

Pin Definition:

1. Gate
2. Source
3. Drain

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (mA)
60	2 @ $V_{GS} = 10V$	300
	4 @ $V_{GS} = 4.5V$	200

Features

- Low On-Resistance
- ESD Protected 2KV
- High Speed Switching
- Low Voltage Drive

Ordering Information

Part No.	Package	Packing
TSM2N7002KCX RF	SOT-23	3Kpcs / 7" Reel
TSM2N7002KCX RFG	SOT-23	3Kpcs / 7" Reel
TSM2N7002KCU RF	SOT-323	3Kpcs / 7" Reel
TSM2N7002KCU RFG	SOT-323	3Kpcs / 7" Reel

Note: "G" denotes for Halogen Free

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

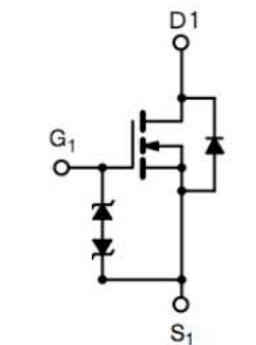
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current	Continuous @ $T_A = 25^\circ C$	I_D	300
	Pulsed	I_{DM}	800
Drain Reverse Current	Continuous @ $T_A = 25^\circ C$	I_{DR}	300
	Pulsed	I_{DMR}	800
Maximum Power Dissipation	P_D	300	mW
Operating Junction 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
Lead Temperature (1/8" from case)	T_L	5	S
Junction to Ambient Thermal Resistance (PCB mounted)	$R_{\theta JA}$	350	$^\circ C/W$

Notes:

- a. Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$
- b. When the device is mounted on a glass epoxy board with area measuring 1 x 0.75 x 0.62 inch.
- c. The power dissipation of the package may result in a continuous drain current.

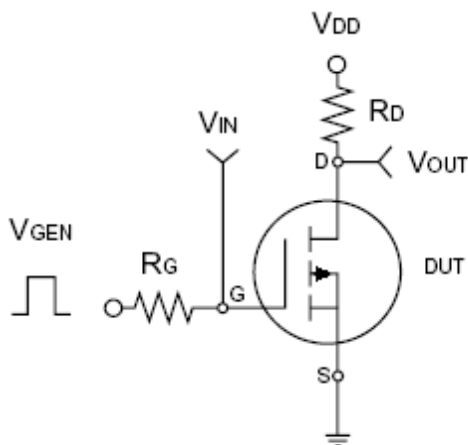
Block Diagram

N-Channel MOSFET

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

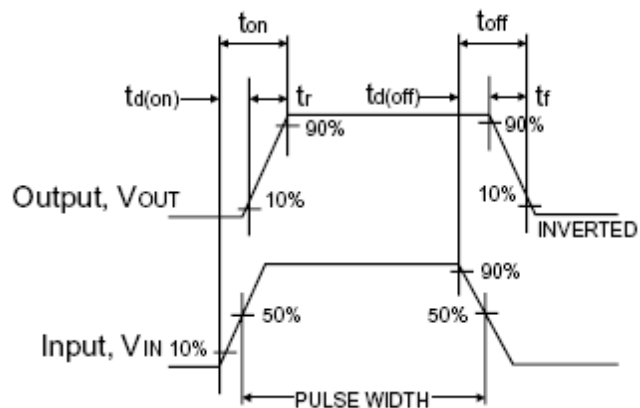
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	BV _{DSS}	60	--	--	V
Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	V _{GS(TH)}	1.0	1.5	2.5	V
Gate Body Leakage	V _{GS} =±20V, V _{DS} =0V	I _{GSS}	--	--	±10	uA
Zero Gate Voltage Drain Current	V _{DS} =60V, V _{GS} =0V	I _{DSS}	--	--	1.0	uA
Drain-Source On-State Resistance	V _{GS} =10V, I _D =300mA	R _{DS(ON)}	--	1.2	2	Ω
	V _{GS} =4.5V, I _D =100mA		--	2	4	
Forward Transconductance	V _{DS} =10V, I _D =200mA	g _{fs}	100	--	--	mS
Diode Forward Voltage	I _S =300mA, V _{GS} =0V	V _{SD}	--	0.8	1.4	V
Dynamic ^b						
Total Gate Charge	V _{DS} =10V, I _D = 250mA, V _{GS} =4.5V	Q _g	--	0.4	0.6	nC
Input Capacitance	V _{DS} = 25V, V _{GS} = 0V, f = 1.0MHz	C _{iss}	--	30	--	pF
Output Capacitance		C _{oss}	--	6	--	
Reverse Transfer Capacitance		C _{rss}	--	2.5	--	
Switching ^c						
Turn-On Delay Time	V _{DD} =30V, R _G =10Ω	t _{d(on)}	--	--	25	nS
Turn-Off Delay Time	I _D =200mA, V _{GEN} =10V,	t _{d(off)}	--	--	35	

Notes:

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



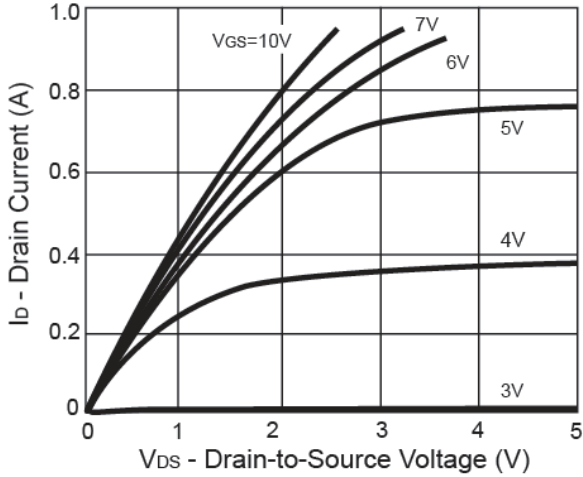
Switching Test Circuit



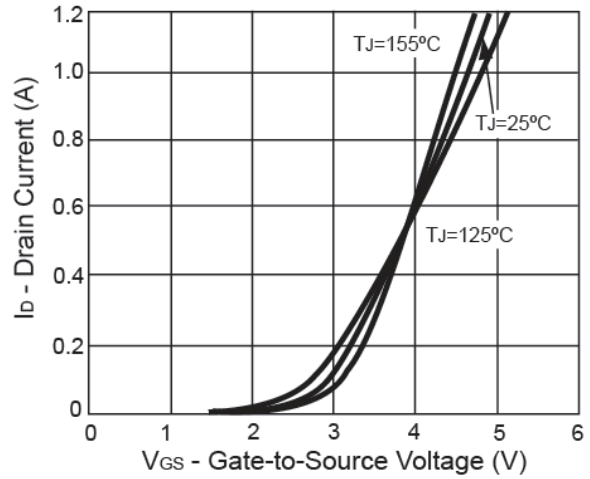
Switchin Waveforms

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

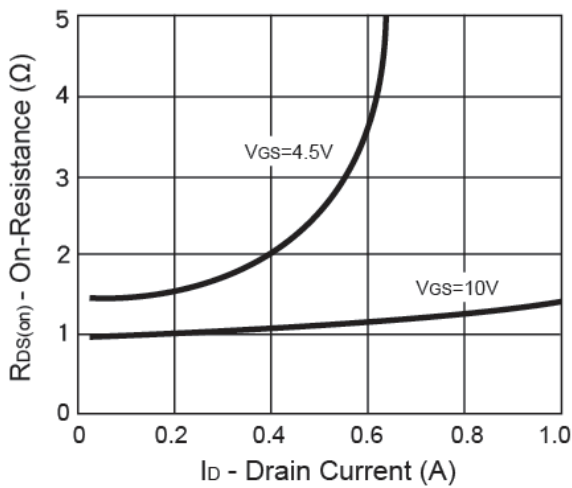
Output Characteristics



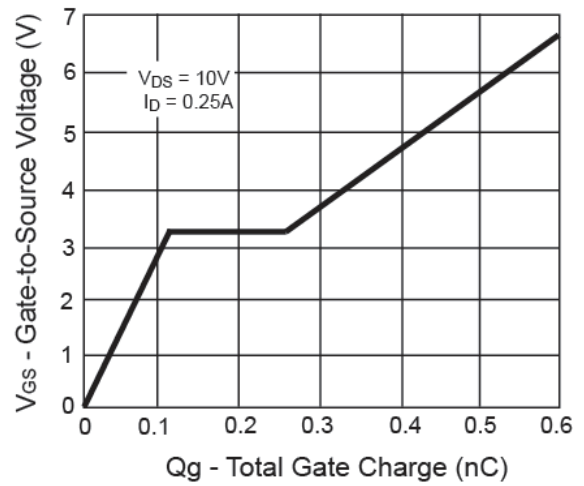
Transfer Characteristics



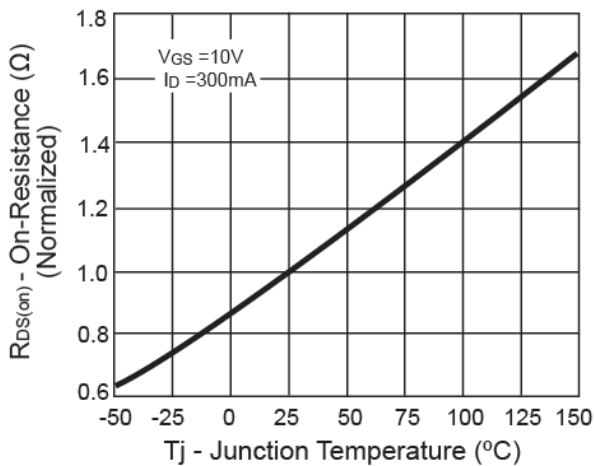
On-Resistance vs. Drain Current



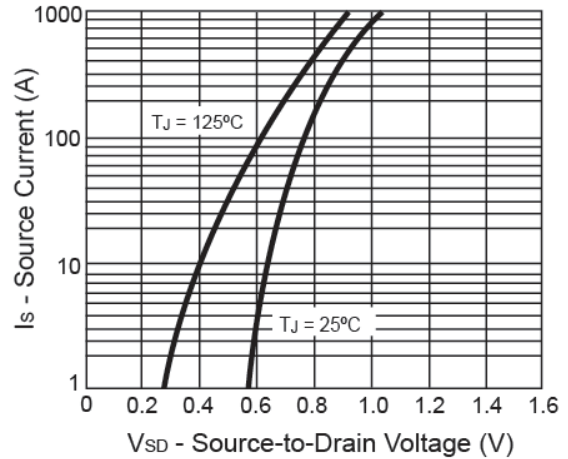
Gate Charge



On-Resistance vs. Junction Temperature

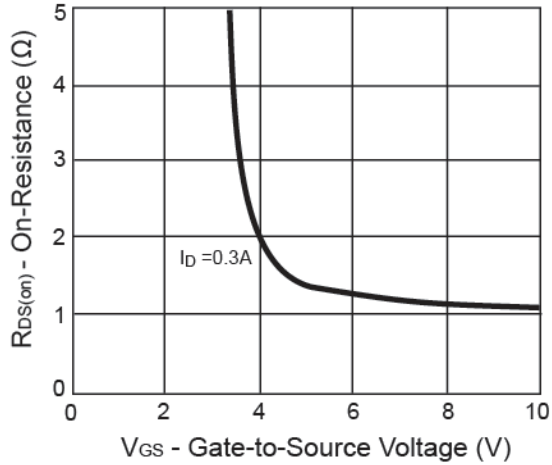


Source-Drain Diode Forward Voltage

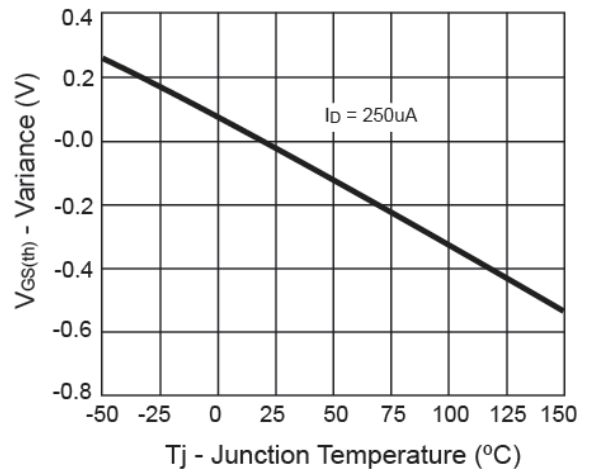


Electrical Characteristics Curve ($T_a = 25^\circ\text{C}$, unless otherwise noted)

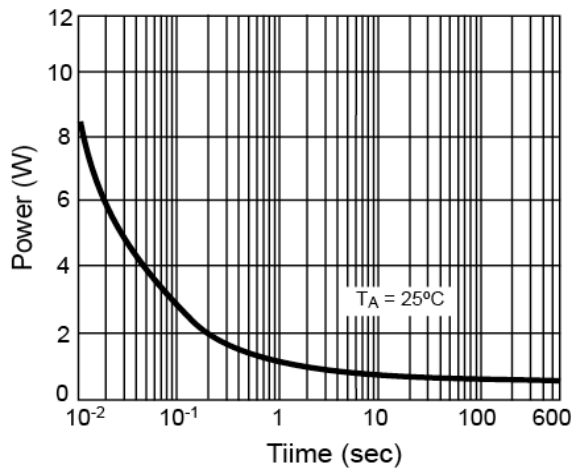
On-Resistance vs. Gate-Source Voltage



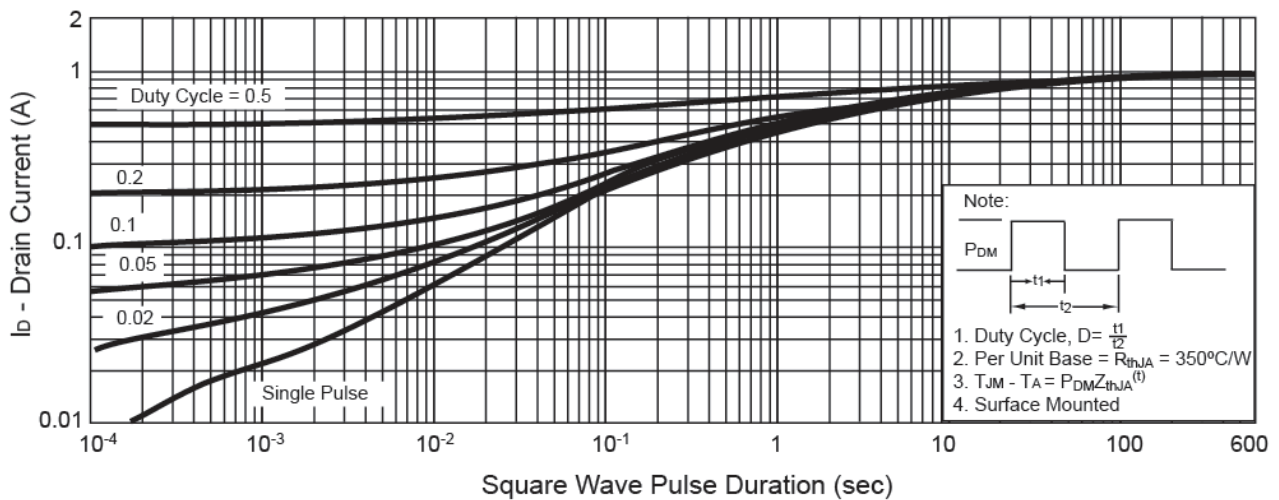
Threshold Voltage



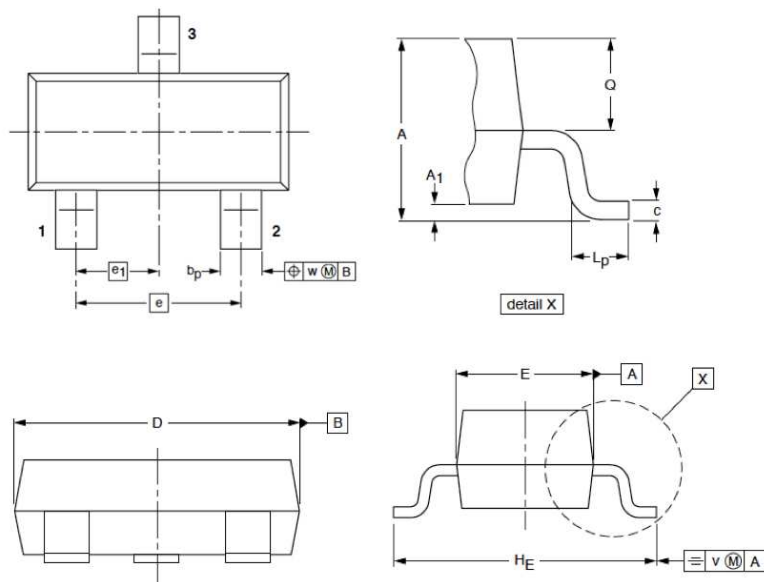
Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

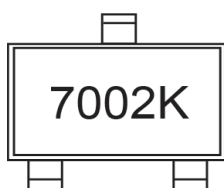


SOT-23 Mechanical Drawing

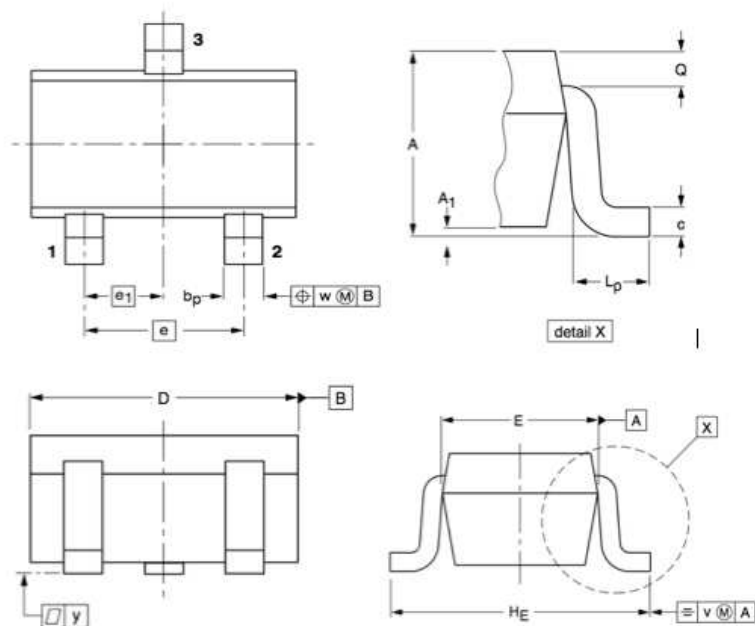


SOT-23 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX.
A	1.00 BSC		0.039 BSC	
A1	--	0.10	--	0.004
bp	0.37	0.42	0.014	0.016
C	0.15	0.09	0.005	0.004
D	2.80	3.00	0.110	0.118
E	1.20	1.40	0.047	0.055
e	1.9 BSC		0.075 BSC	
e1	0.95 BSC		0.037 BSC	
H _E	2.35	2.45	0.093	0.096
L _P	0.15	0.45	0.005	0.018
Q	0.45	0.55	0.018	0.022
V	0.2 BSC		0.007 BSC	
W	0.1 BSC		0.004 BSC	

Marking Diagram

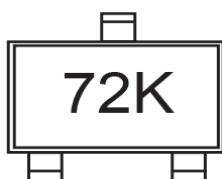


SOT-323 Mechanical Drawing



SOT-323 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.80	1.10	0.031	0.043
A1	--	0.10	--	0.004
bp	0.30	0.40	0.012	0.016
C	0.10	0.25	0.004	0.010
D	1.80	2.20	0.071	0.087
E	1.15	1.35	0.045	0.053
e	1.30 BSC		0.051 BSC	
e1	0.65 BSC		0.026 BSC	
H _E	2.00	2.20	0.079	0.087
Lp	0.15	0.45	0.006	0.018
Q	0.20 BSC		0.007 BSC	
W	0.20 BSC		0.007 BSC	

Marking Diagram



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