

### SOT-92



#### Pin Definition:

1. Gate
2. Source
3. Drain

### PRODUCT SUMMARY

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (mA)
60	5 @ $V_{GS} = 10V$	500

### Features

- Fast Switching Speed
- Low Input and Output Leakage

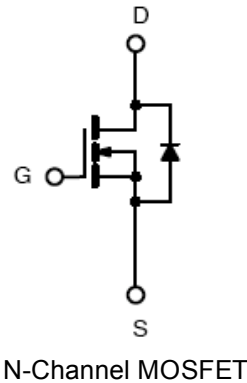
### Application

- Direct Logic-Level Interface: TTL/CMOS
- Solid-State Relays

### Ordering Information

Part No.	Package	Packing
TSM2N7000CT B0	TO-92	1Kpcs / Bulk
TSM2N7000CT A3	TO-92	2Kpcs / Ammo

### Block Diagram



### 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	$V_{GS}$	$\pm 20$	V
Continuous Drain Current	$I_D$	200	mA
Pulsed Drain Current	$I_{DM}$	500	mA
Continuous Source Current (Diode Conduction) <sup>a,b</sup>	$I_S$	500	mA
Maximum Power Dissipation	$P_D$	$T_a = 25^\circ C$	350
		$T_a = 75^\circ C$	280
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)	$T_L$	10	S
Junction to Ambient Thermal Resistance (PCB mounted)	$R\theta_{JA}$	357	$^\circ C/W$

#### Notes:

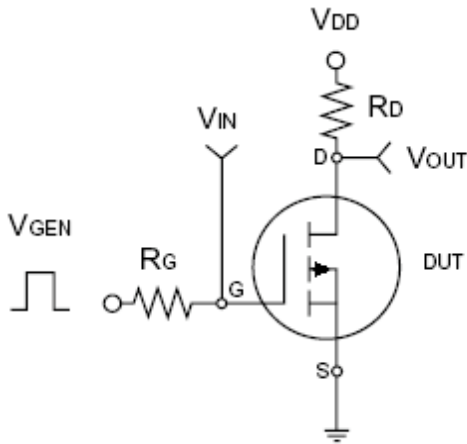
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board,  $t \leq 5$  sec.

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

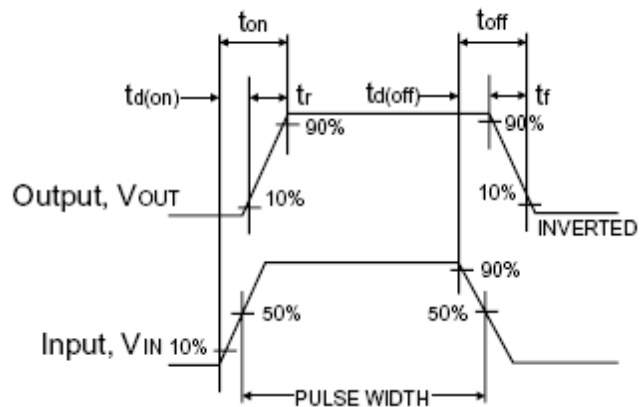
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 10\mu A$	$BV_{DSS}$	60	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 1mA$	$V_{GS(TH)}$	0.8	--	3.0	V
Gate Body Leakage	$V_{GS} = \pm 15V, V_{DS} = 0V$	$I_{GSS}$	--	--	$\pm 10$	nA
Zero Gate Voltage Drain Current	$V_{DS} = 48V, V_{GS} = 0V$	$I_{DSS}$	--	--	1.0	$\mu A$
Drain-Source On-State Resistance	$V_{GS} = 10V, I_D = 500mA$	$R_{DS(ON)}$	--	--	5.0	$\Omega$
	$V_{GS} = 5V, I_D = 50mA$		--	7.5	--	
Forward Transconductance	$V_{DS} = 15V, I_D = 300mA$	$g_{fs}$	--	320	--	mS
Diode Forward Voltage	$I_S = 200mA, V_{GS} = 0V$	$V_{SD}$	--	1.3	1.5	V
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1.0MHz$	$C_{iss}$	--	60	--	pF
Output Capacitance		$C_{oss}$	--	25	--	
Reverse Transfer Capacitance		$C_{rss}$	--	5	--	
<b>Switching<sup>c</sup></b>						
Turn-On Rise Time	$V_{DD} = 15V, R_L = 30\Omega,$ $I_D = 500mA,$ $V_{GEN} = 10V, R_G = 25\Omega$	$t_r$	--	10	--	nS
Turn-Off Fall Time		$t_f$	--	10	--	

**Notes:**

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

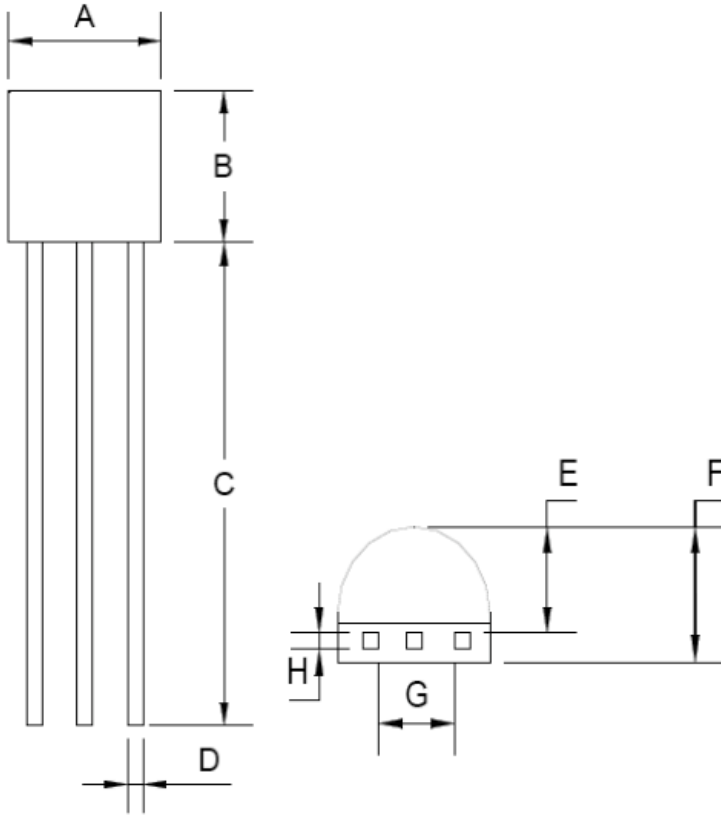


**Switching Test Circuit**



**Switchin Waveforms**

**TO-92 Mechanical Drawing**



TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	14.30(typ)		0.563(typ)	
D	0.43	0.49	0.017	0.019
E	2.19	2.81	0.086	0.111
F	3.30	3.70	0.130	0.146
G	2.42	2.66	0.095	0.105
H	0.37	0.43	0.015	0.017

### 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.