

### 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

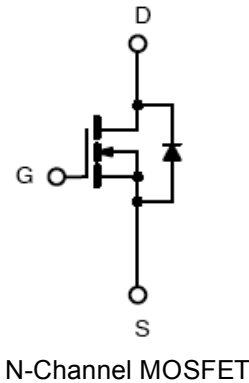
### Application

- 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:

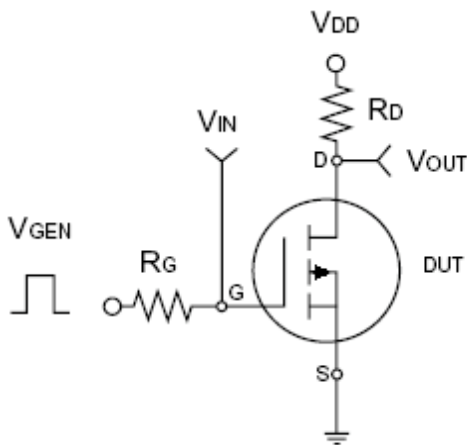
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board,  $t \leq 5$  sec.

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

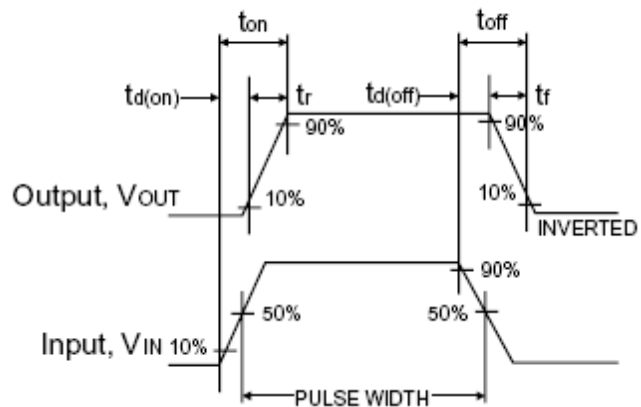
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 10\mu A$	$BV_{DSS}$	60	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 1mA$	$V_{GS(TH)}$	0.8	--	3.0	V
Gate Body Leakage	$V_{GS} = \pm 15V, V_{DS} = 0V$	$I_{GSS}$	--	--	$\pm 10$	nA
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.

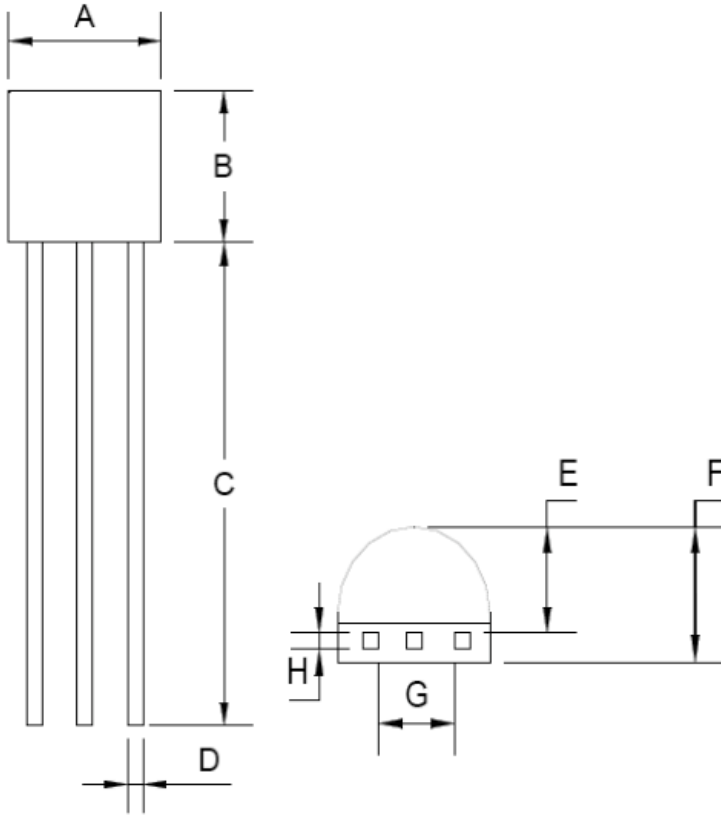


**Switching Test Circuit**



**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

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