



# TSM2N7000

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## 60V N-Channel Enhancement Mode MOSFET

TO-92



Pin assignment:

1. Gate
2. Source
3. Drain

$V_{DS} = 60V$

$I_D = 200mA$

$R_{DS(on)}, V_{GS} @ 10V, I_{DS} @ 500mA = 5.0\Omega$

### General Description

The TSM2N7000 is produced using high cell density, DMOS technology. These products have been designed to minimize on-state resistance while provide rugged, reliable and fast switching performance. It can be used in most applications requiring up to 200mA DC and can deliver pulsed currents up to 500mA. This product is particularly suited for low voltage, low current application such as small servo motor control, power MOSFET gate drivers, and other switching applications.

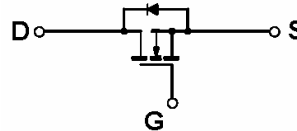
### Features

- ◇ High density cell design for low on-resistance
- ◇ Voltage control small signal switch
- ◇ Rugged and reliable
- ◇ High saturation current capability
- ◇ Provide in TO-92 package

### Ordering Information

Part No.	Packing	Package
TSM2N7000CT A3	Ammo pack	TO-92
TSM2N7000CT B0	Bulk pack	

### Block Diagram



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	60	V
Drain-Gate Voltage	$V_{DGR}$	60	V
Gate-Source Voltage --- Continuous --- Pulsed	$V_{GS}$	$\pm 20$	V
	$V_{GSM}$	$\pm 40$	
Continuous Drain Current	$I_D$	200	mA
Pulsed Drain Current	$I_{DM}$	500	mA
Maximum Power Dissipation	$P_D$	Ta = 25 °C	350
		Ta > 25 °C	2.8
Operating Junction Temperature	$T_J$	+150	°C
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	- 55 to +150	°C

### Thermal Performance

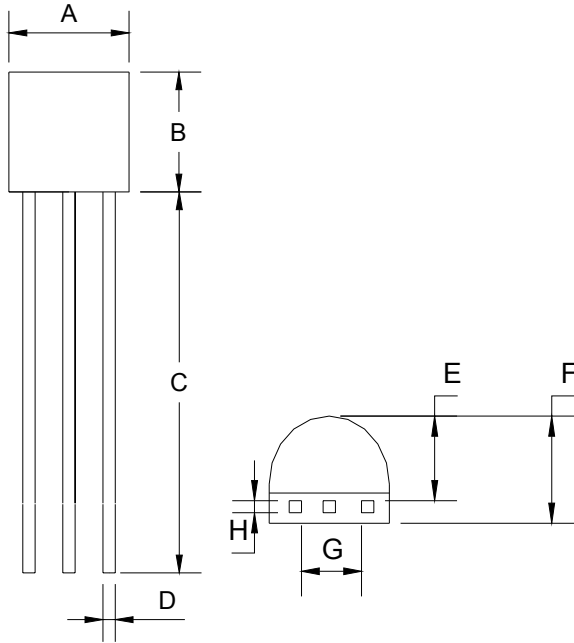
Parameter	Symbol	Limit	Unit
Lead Temperature (1/8" from case)	$T_L$	10	S
Junction to Ambient Thermal Resistance	$R_{\theta ja}$	357	°C/W



Electrical Characteristics						
Tj = 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
Drain-Source On-State Resistance *	$V_{GS} = 10V, I_D = 500mA$	$R_{DS(ON)}$	--	--	5.0	$\Omega$
	$V_{GS} = 5V, I_D = 50mA$	$R_{DS(ON)}$	--	7.5	--	
Drain-Source On-Voltage *	$V_{GS} = 0V, I_D = 10\mu A$	$V_{DS(ON)}$	--	--	2.5	V
Gate Threshold Voltage *	$V_{DS} = V_{GS}, I_D = 1.0mA$	$V_{GS(TH)}$	0.8	--	3.0	V
Zero Gate Voltage Drain Current	$V_{DS} = 48V, V_{GS} = 0V$	$I_{DSS}$	--	--	1.0	$\mu A$
Gate Body Leakage - Forward	$V_{GS} = 15V, V_{DS} = 0V$	$I_{GSS}$	--	--	- 10	nA
On-State Drain Current	$V_{DS} \leq 5V, V_{GS} = 10V$	$I_{D(ON)}$	60	--	--	mA
<b>Dynamic</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	--	
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>Source-Drain Diode</b>						
Max. Diode Forward Current		$I_S$	--	--	500	mA
Diode Forward Voltage	$I_S = 200mA, V_{GS} = 0V$	$V_{SD}$	--	1.3	1.5	V

\* Note : pulse test: pulse width  $\leq 300\mu S$ , duty cycle  $\leq 2\%$

## 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