TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSM2N7000K

60V N-Channel MOSFET

TO-92

Pin Definition:
1. Source
2. Gate
3. Drain

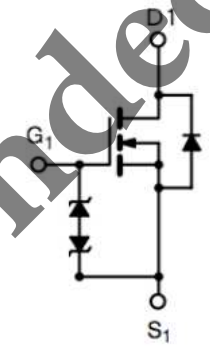
PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$(Ω)	I_D (mA)
60	5 @ V_{GS} = 10V	100
	5.5 @ V_{GS} = 5V	100

Features

- Low On-Resistance
- ESD Protection
- High Speed Switching
- Low Voltage Drive

Block Diagram



N-Channel MOSFET

Ordering Information

Part No.	Package	Packing
TSM2N7000KCT B0G	TO-92	1Kpcs / Bulk
TSM2N7000KCT A3G	TO-92	2Kpcs / Ammo

Note: "G" denotes for Halogen Free

Absolute Maximum Rating (Ta = 25°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=25ºC	I_D	300	mA
	Pulsed	I_{DM}	700	
Drain Reverse Current	Continuous @ T_A=25ºC	I_{DR}	300	mA
	Pulsed	I_{DMR}	700	
Maximum Power Dissipation		P_D	400	mW
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 (PCB mounted)	$R\Theta_{JA}$	357	°C/W

Notes:

a. Pulse width limited by the Maximum junction temperature

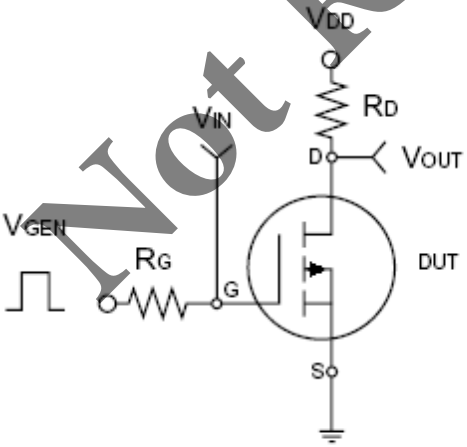
b. Surface Mounted on FR4 Board, t ≤ 5 sec.

TSM2N7000K
60V N-Channel MOSFET

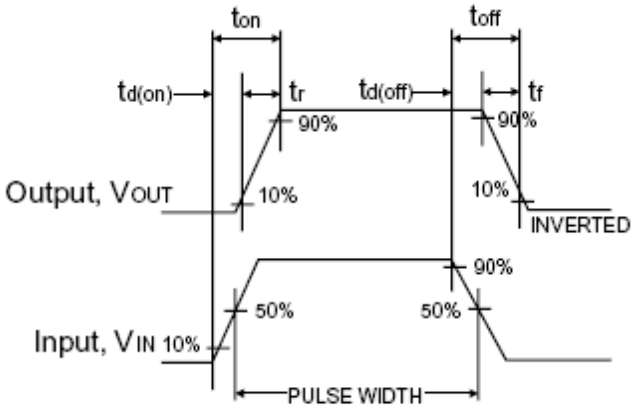
Electrical Specifications (Ta = 25°C, unless otherwise noted)

Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V_{GS} = 0V, I_D = 10μA	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	$V_{GS(TH)}$	1.0	--	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 = 100mA	$R_{DS(ON)}$	--	3	5	Ω
	V_{GS} = 5V, I_D = 100mA		--	3.6	5.5	
Forward Transconductance	V_{DS} = 10V, I_D = 200mA	g_{fs}	100	--	--	mS
Diode Forward Voltage	I_S = 300mA, V_{GS} = 0V	V_{SD}	--	0.9	1.2	V
Dynamic[b]						
Total Gate Charge	V_{DS} = 10V, I_D = 250mA, V_{GS} = 4.5V	Q_g	--	0.4	--	nC
Input Capacitance	V_{DS} = 25V, V_{GS} = 0V, f = 1.0MHz	C_{iss}	--	7.32	--	pF
Output Capacitance		C_{oss}	--	3.42	--	
Reverse Transfer Capacitance		C_{rss}	--	7.63	--	
Switching[c]						
Turn-On Delay Time	V_{DD} = 30V, R_G = 10Ω I_D = 100mA, V_{GEN} = 10V,	$t_{d(on)}$	--	25	--	nS
Turn-Off Delay Time		$t_{d(off)}$	--	35	--	

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



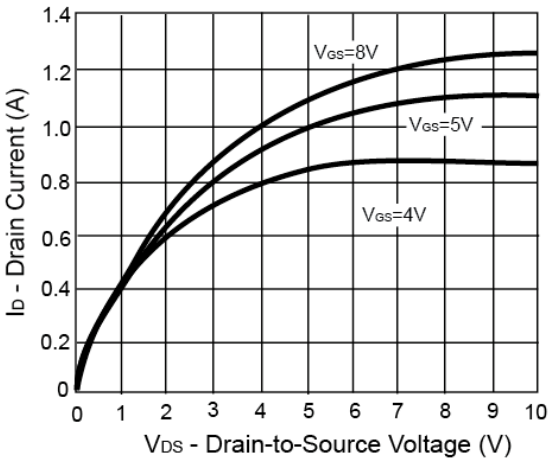
Switching Test Circuit



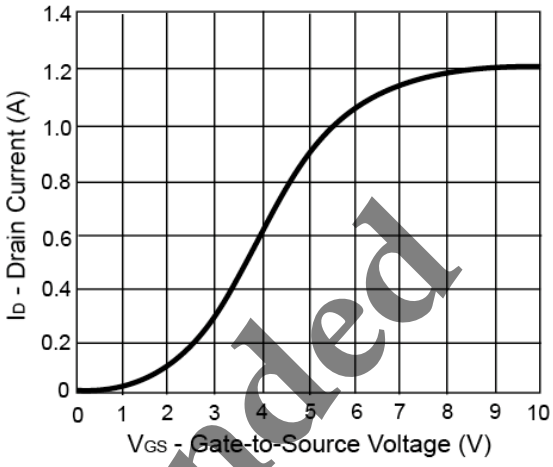
Switchin Waveforms

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

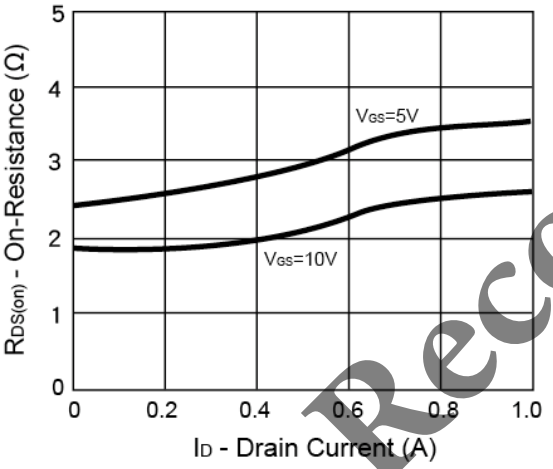
Output Characteristics



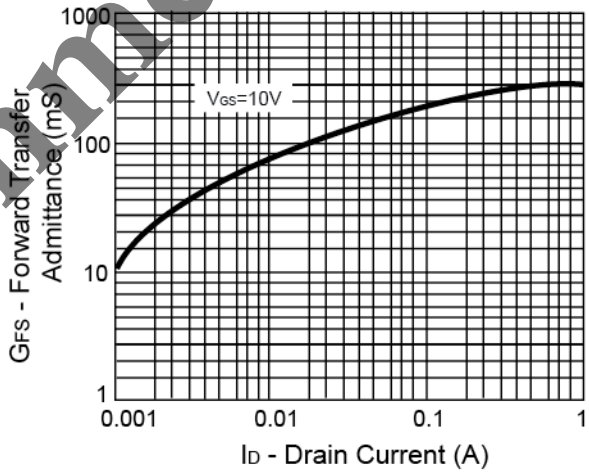
Transfer Characteristics



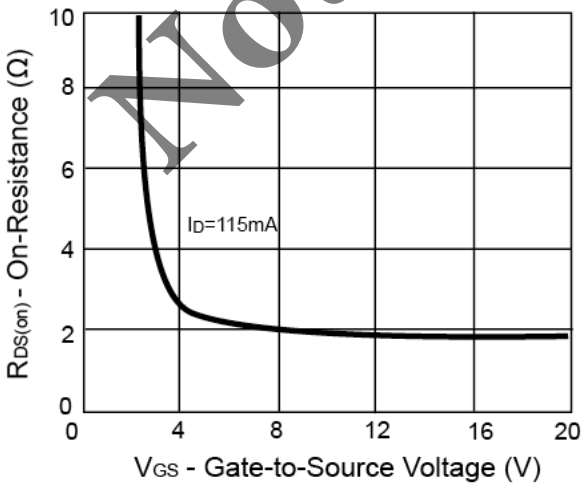
On-Resistance vs. Drain Current



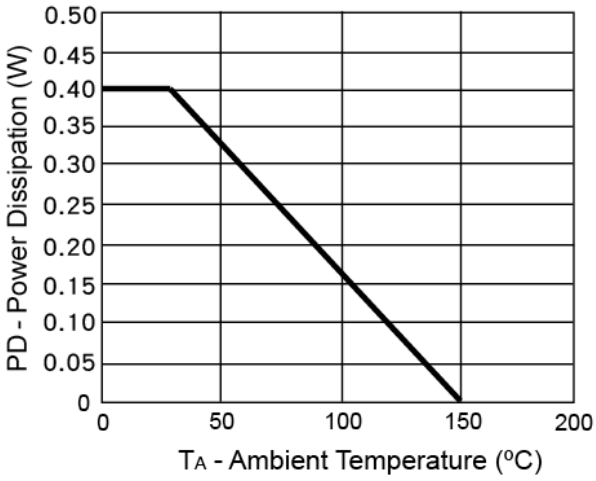
Forward Transfer Admittance vs. Drain Current



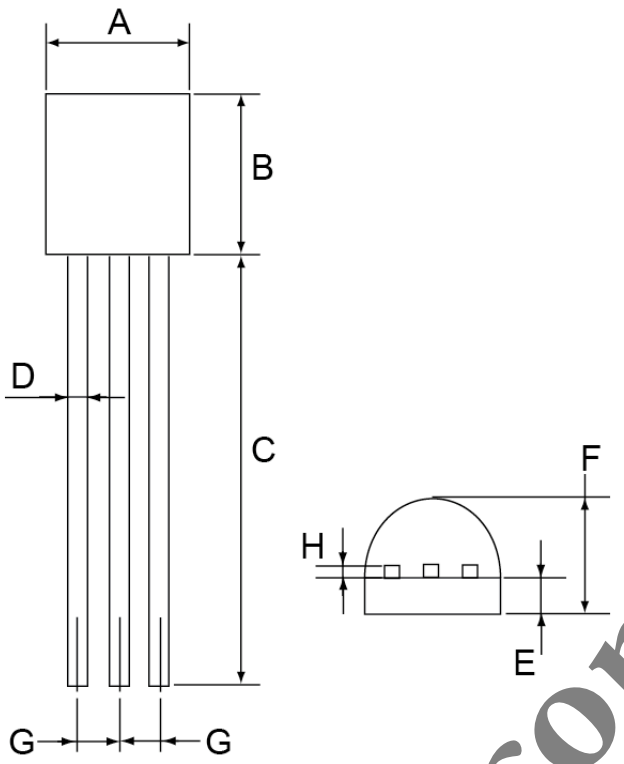
On-Resistance vs. Gate-Source Voltage



Power Derating Curve

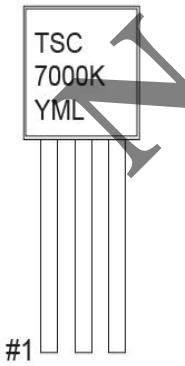


TO-92 Mechanical Drawing



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	13.53 (typ)		0.532 (typ)	
D	0.39	0.49	0.015	0.019
E	1.18	1.28	0.046	0.050
F	3.30	3.70	0.130	0.146
G	1.27	1.31	0.050	0.051
H	0.33	0.43	0.013	0.017

Marking Diagram

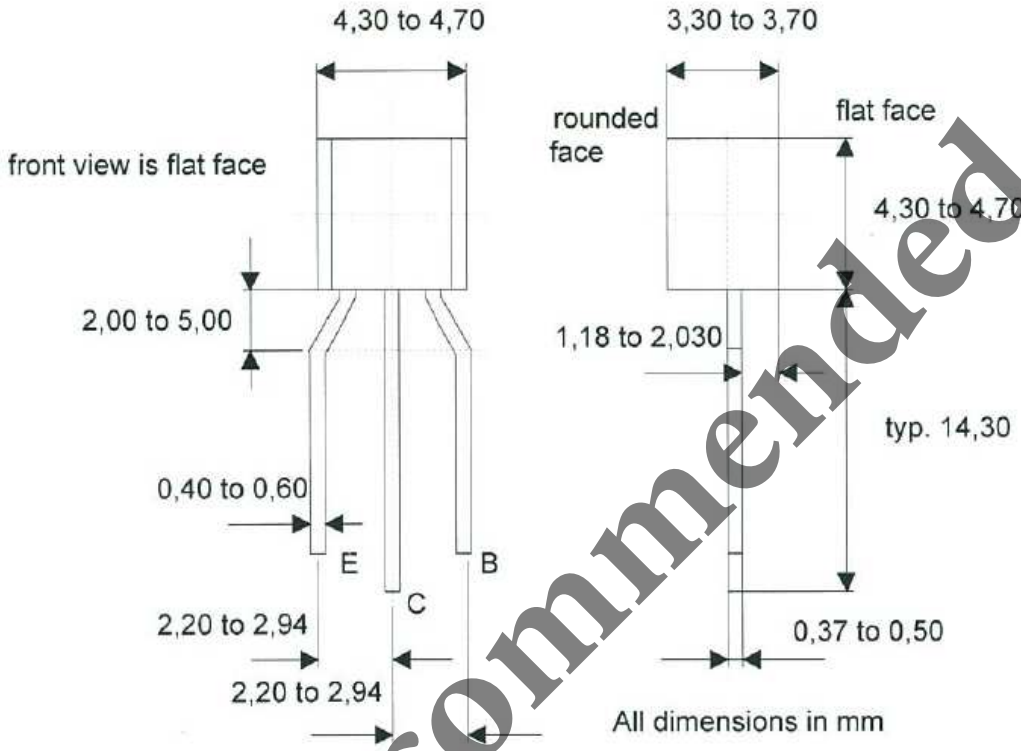


Y = Year Code
M = Month Code for Halogen Free Product

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

TO-92 Ammo Pack Mechanical Drawing



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.