TAIWAN SEMICONDUCTOR

RoHS COMPLIANCE

TSM2N7000K

60V N-Channel MOSFET

TO-92

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

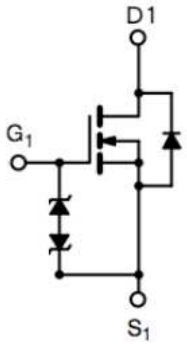
PRODUCT SUMMARY

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 B0	TO-92	1Kpcs / Bulk
TSM2N7000KCT A3	TO-92	2Kpcs / Ammo

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	ºC/W

Notes:

a. Pulse width limited by the Maximum junction temperature

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

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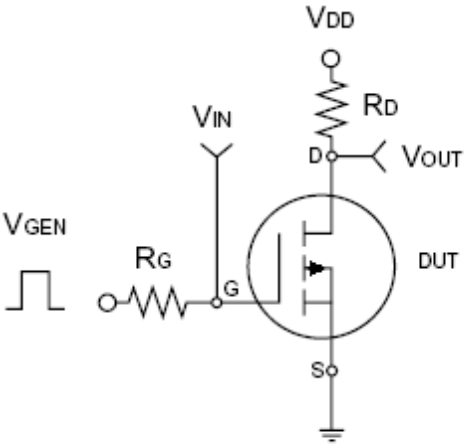
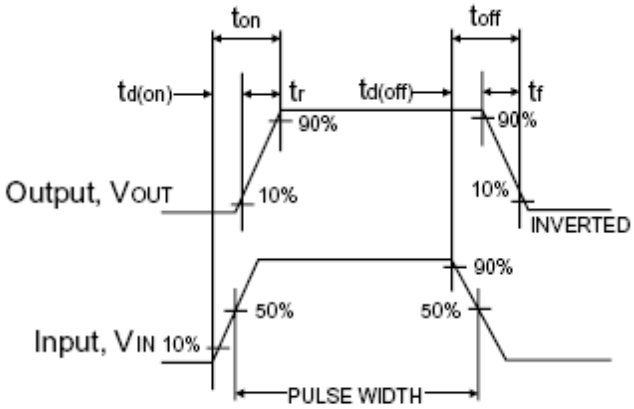
Electrical Specifications (Ta = 25°C, unless otherwise noted)

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.



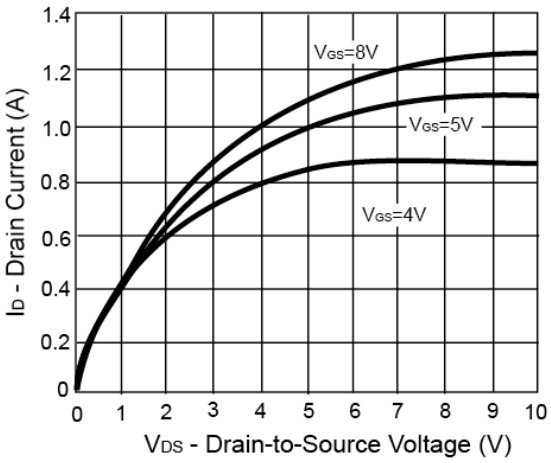
Switching Test Circuit



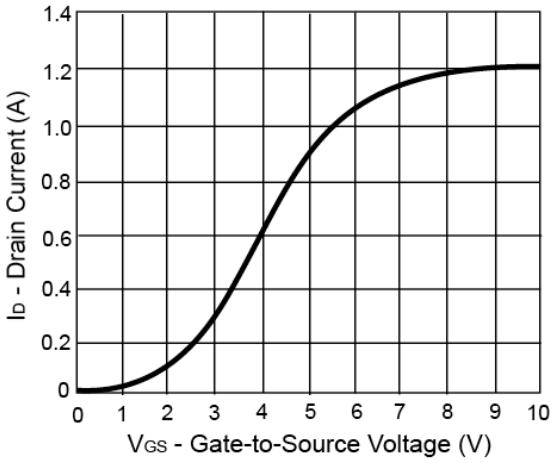
Switchin Waveforms

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

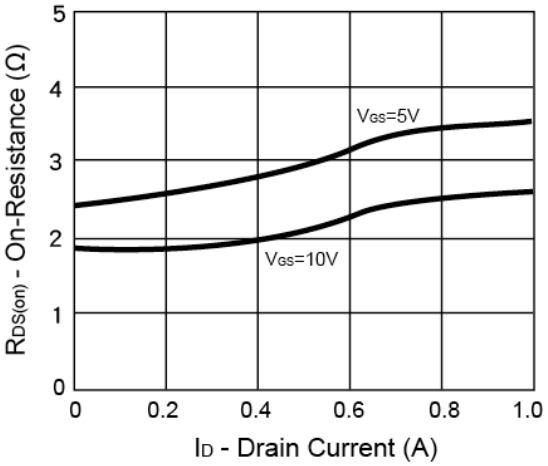
Output Characteristics



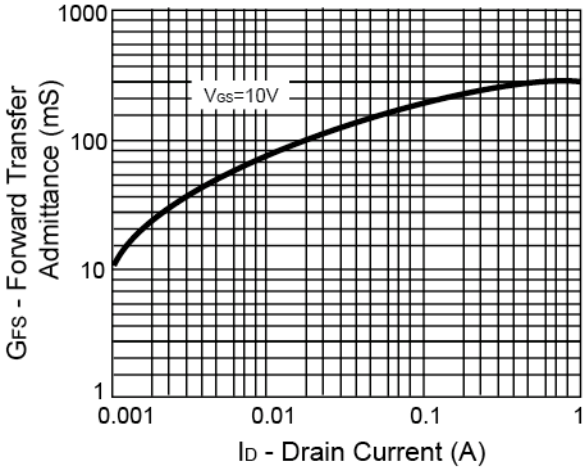
Transfer Characteristics



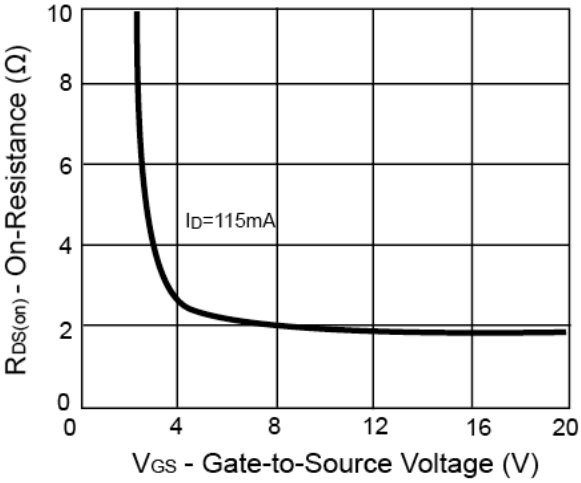
On-Resistance vs. Drain Current



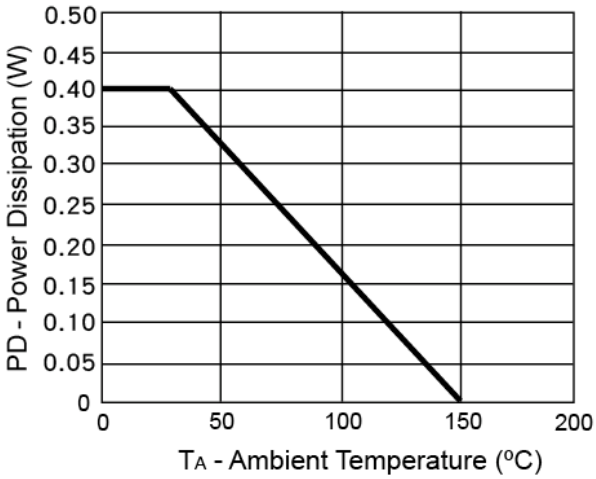
Forward Transfer Admittance vs. Drain Current



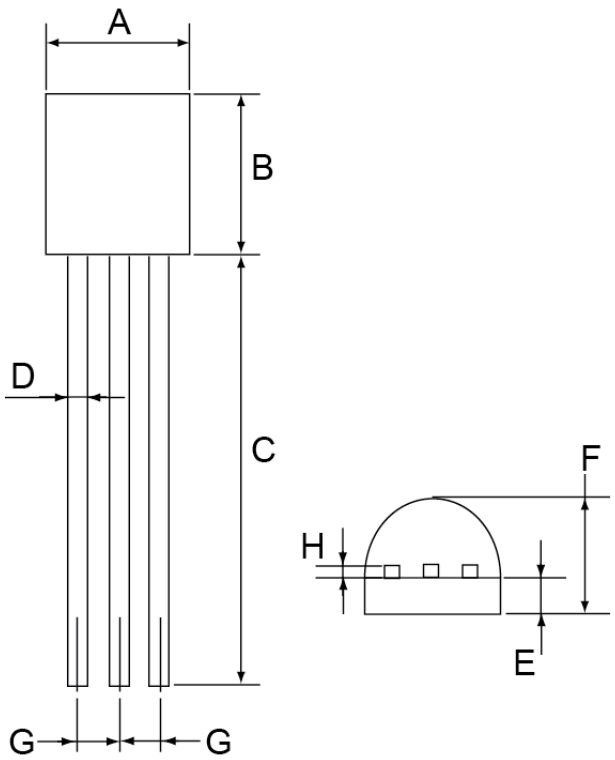
On-Resistance vs. Gate-Source Voltage



Power Derating Curve

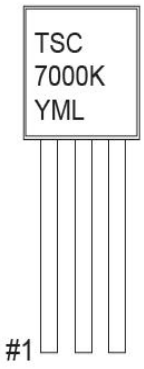


TO-92 Mechanical Drawing



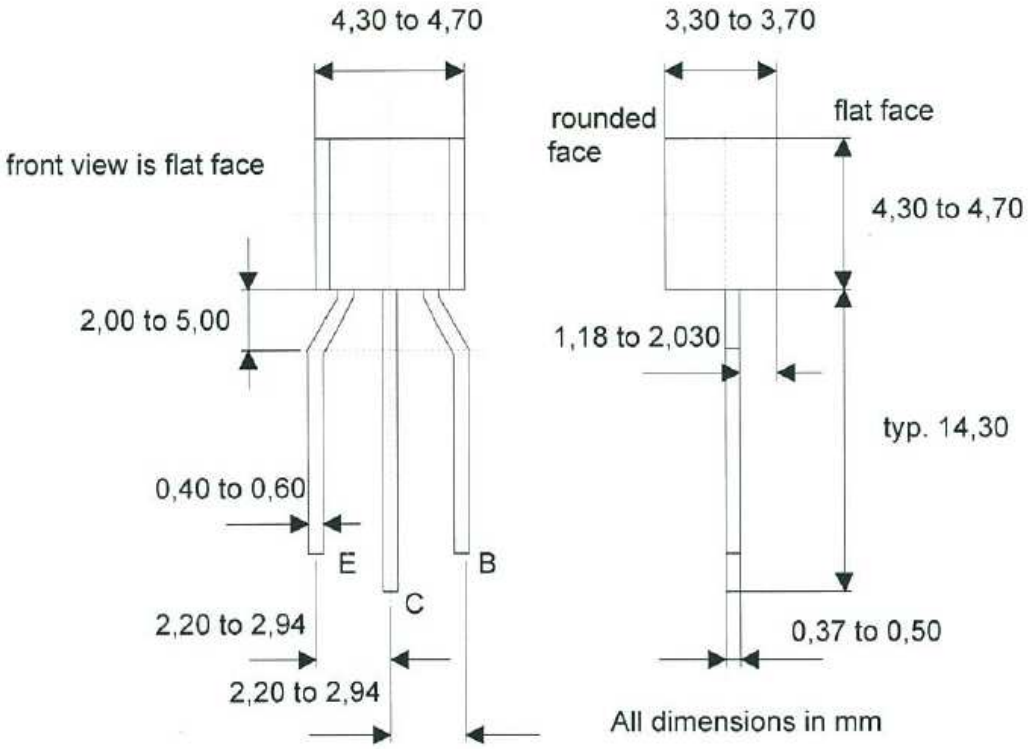
TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	13.53 (typ)		0.532 (typ)	
D	0.39	0.49	0.015	0.019
E	1.18	1.28	0.046	0.050
F	3.30	3.70	0.130	0.146
G	1.27	1.31	0.050	0.051
H	0.33	0.43	0.013	0.017

Marking Diagram



Y = Year Code
M = Month Code
(**A**=Jan, **B**=Feb, **C**=Mar, **D**=Apl, **E**=May, **F**=Jun, **G**=Jul, **H**=Aug, **I**=Sep, **J**=Oct, **K**=Nov, **L**=Dec)
L = Lot Code

TO-92 Ammo Pack Mechanical Drawing



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