

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

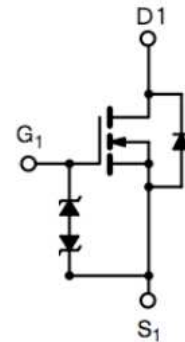
Features

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

Ordering Information

Part No.	Package	Packing
TSM2N7000KCT B0	TO-92	1Kpcs / Bulk
TSM2N7000KCT A3	TO-92	2Kpcs / Ammo

Block Diagram



N-Channel MOSFET

Absolute Maximum Rating ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current	Continuous @ $T_A = 25^\circ\text{C}$	I_D	300	mA
	Pulsed	I_{DM}	700	
Drain Reverse Current	Continuous @ $T_A = 25^\circ\text{C}$	I_{DR}	300	mA
	Pulsed	I_{DMR}	700	
Maximum Power Dissipation		P_D	400	mW
Operating Junction Temperature		T_J	+150	$^\circ\text{C}$
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55 to +150	$^\circ\text{C}$

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	$^\circ\text{C/W}$

Notes:

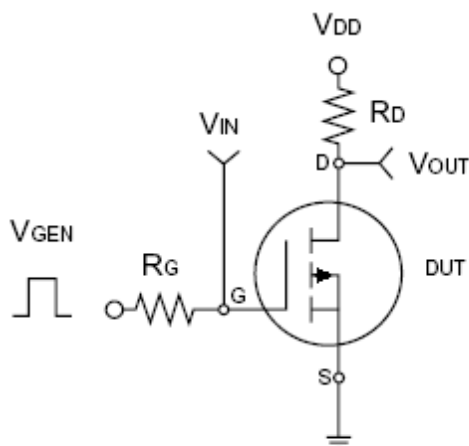
- a. Pulse width limited by the Maximum junction temperature
- b. Surface Mounted on FR4 Board, $t \leq 5$ sec.

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

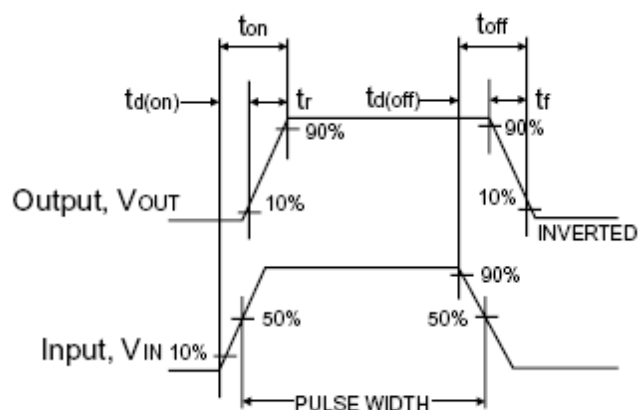
Parameter	Conditions	Symbol	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 10\mu A$	BV_{DSS}	60	--	--	V
Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	$V_{GS(TH)}$	1.0	--	2.5	V
Gate Body Leakage	$V_{GS} = \pm 20V, V_{DS} = 0V$	I_{GSS}	--	--	± 10	μA
Zero Gate Voltage Drain Current	$V_{DS} = 60V, V_{GS} = 0V$	I_{DSS}	--	--	1.0	μA
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	$V_{DD} = 30V, R_G = 10\Omega$	$t_{d(on)}$	--	25	--	nS
Turn-Off Delay Time	$I_D = 100mA, V_{GEN} = 10V,$	$t_{d(off)}$	--	35	--	

Notes:

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



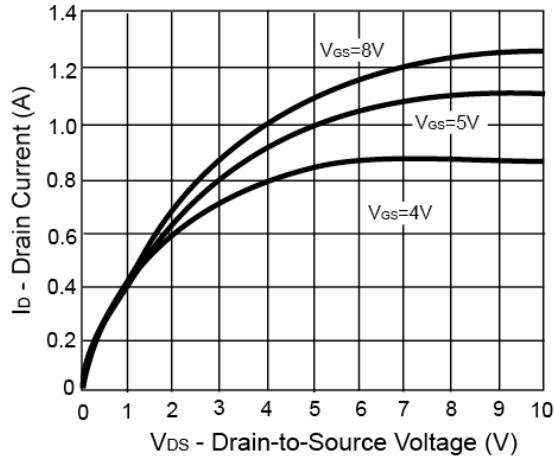
Switching Test Circuit



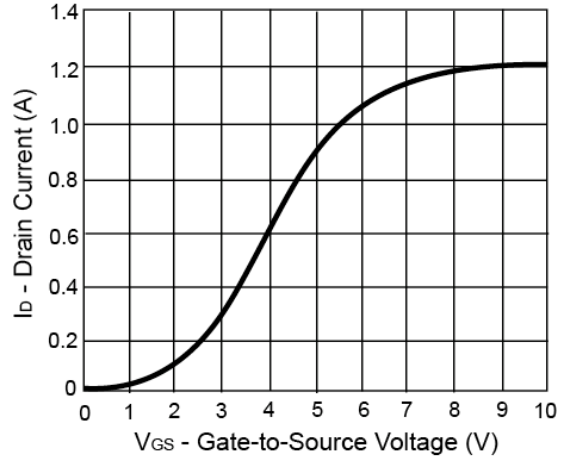
Switchin Waveforms

Electrical Characteristics Curve ($T_a = 25^{\circ}\text{C}$, unless otherwise noted)

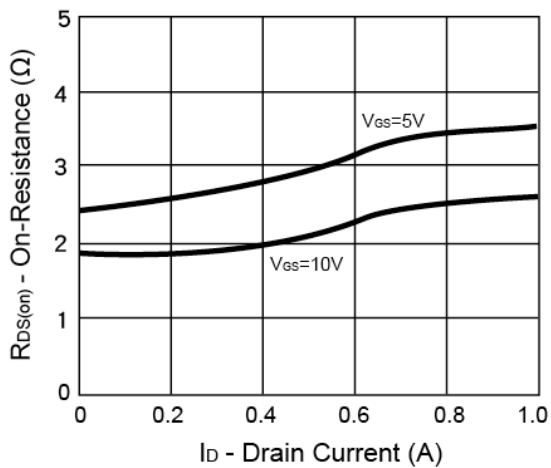
Output Characteristics



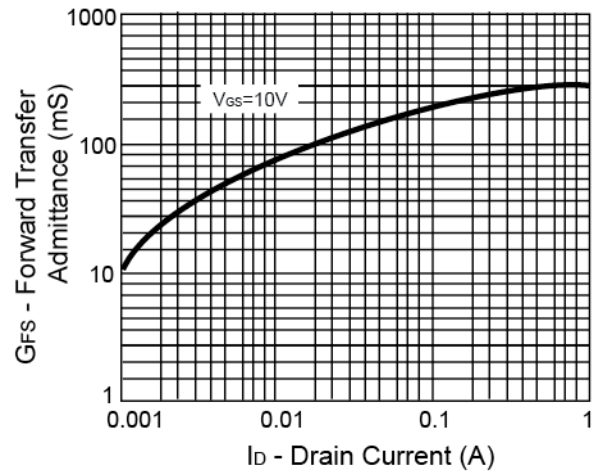
Transfer Characteristics



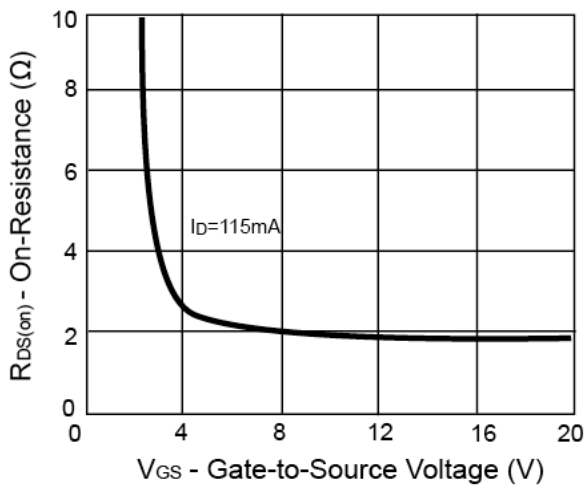
On-Resistance vs. Drain Current



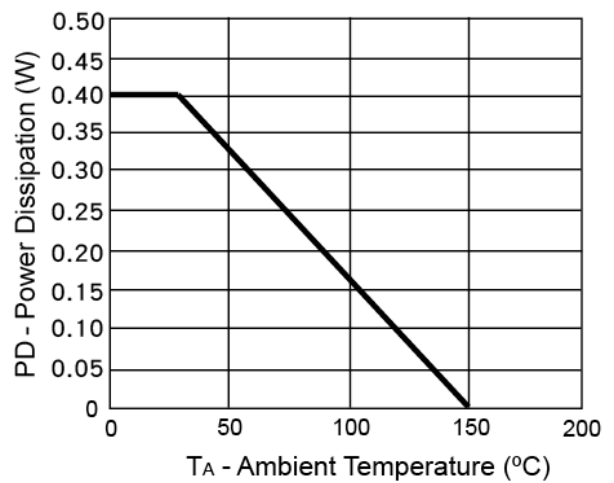
Forward Transfer Admittance vs. Drain Current



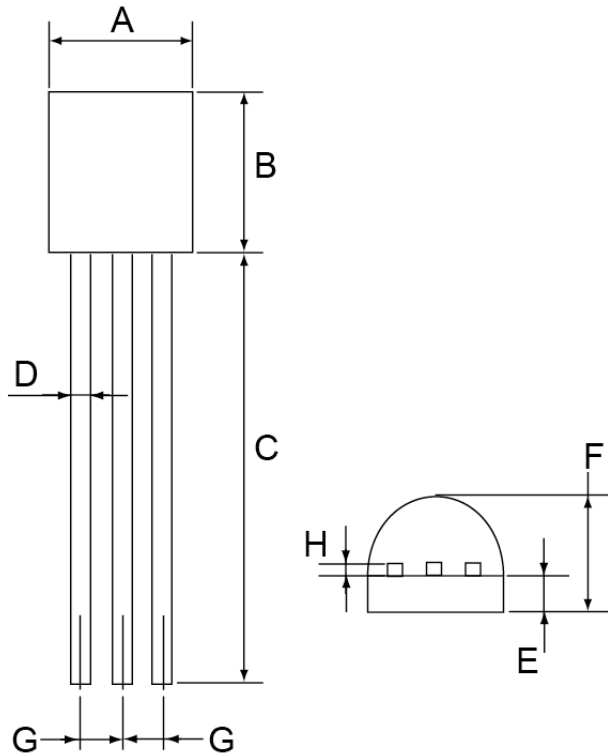
On-Resistance vs. Gate-Source Voltage



Power Derating Curve

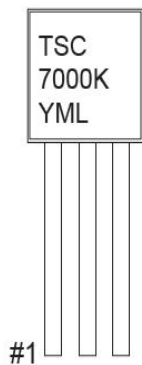


TO-92 Mechanical Drawing



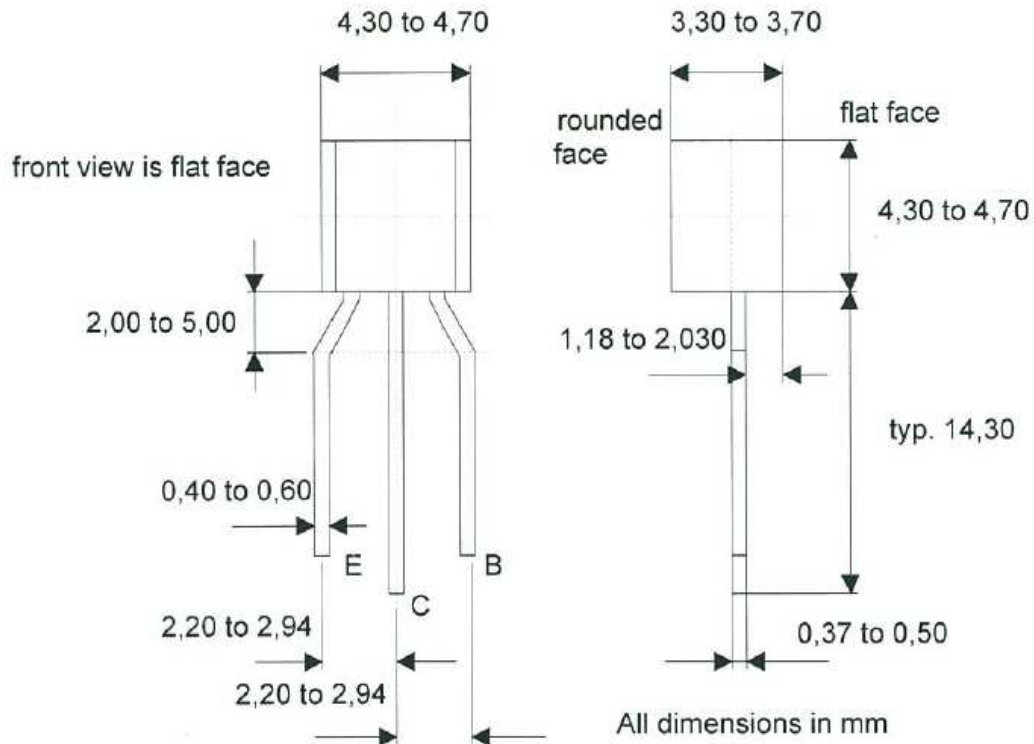
TO-92 DIMENSION				
DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.30	4.70	0.169	0.185
B	4.30	4.70	0.169	0.185
C	13.53 (typ)		0.532 (typ)	
D	0.39	0.49	0.015	0.019
E	1.18	1.28	0.046	0.050
F	3.30	3.70	0.130	0.146
G	1.27	1.31	0.050	0.051
H	0.33	0.43	0.013	0.017

Marking Diagram



- Y** = Year Code
M = Month Code
 (A=Jan, B=Feb, C=Mar, D=Apr, 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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