2N7000KL vs. 2N7000

Description: **N-Channel, 60 V (D-S) MOSFET**
Package: **TO-92**
Pin Out: **Identical**

Part Number Replacements:
2N7000KL-TR1 Replaces 2N7000-TR1
2N7000KL-TR1-E3 (Lead (Pb)-free Version) Replaces 2N7000-TR1

ABSOLUTE MAXIMUM RATINGS T_A = 25 °C, unless otherwise noted					
Parameter		**Symbol**	**2N7000KL**	**2N7000**	**Unit**
Drain-Source Voltage		V_{DS}	60	60	V
Gate-Source Voltage		V_{GS}	± 20	± 20	
Continuous Drain Current	T_A = 25 °C	I_D	0.47	0.2	A
	See Notes		0.37[a]	0.13[b]	
Pulsed Drain Current		I_{DM}	1.0	0.5	
Power Dissipation	T_A = 25 °C	P_D	0.8	0.4	W
	See Notes		0.51[a]	0.16[b]	
Operating Junction and Storage Temperature Range		T_j and T_{stg}	- 55 to 150	- 55 to 150	°C
Maximum Junction-to-Ambient		R_{thJA}	156	312.5	°C/W

Notes:
a. I_D and P_D at 70 °C.
b. I_D and P_D at 100 °C.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted									
Parameter		**Symbol**	**2N7000KL**			**2N7000**			**Unit**
			Min	**Typ**	**Max**	**Min**	**Typ**	**Max**	
Static									
Drain-Source Breakdown Voltage		$V_{(BR)DSS}$	60			60			V
Gate-Threshold Voltage		$V_{G(th)}$	1.0	2.0	2.5	0.8	2	3.0	
Gate-Body Leakage		I_{GSS}			± 1000			± 10	nA
Zero Gate Voltage Drain Current		I_{DSS}			1			1	µA
On-State Drain Current	V_{GS} = 10 V	$I_{D(on)}$	0.8				1		A
Drain-Source On-Resistance	V_{GS} = 10 V	$r_{Ds(on)}$		1.1	2.0		2.4	5	Ω
	V_{GS} = 4.5 V			1.6	4.0		4.5	5.3	
Forward Transconductance		g_{fs}		550		100			mS
Diode Forward Voltage		V_{SD}		0.87	1.3			NS[a]	V
Dynamic									
Total Gate Charge		Q_g		0.4	0.6		0.5[b]		nC
Gate-Source Charge		Q_{gs}		0.11			0.2[b]		
Gate-Drain Charge		Q_{gd}		0.15			0.45[b]		
Switching									
Turn-On Time		t_{ON}		8.6[c]	25[c]		7		ns
Turn-Off Time		t_{OFF}		22.4[c]	35[c]		11		

Notes:
a. NS denotes parameter not specified in the original data sheet.
b. Q_g, Q_{gs} and Q_{gd} for 2N7000 are not specified, values above taken from characteristic curves.
c. Turn-On and Turn-Off time for 2N7000KL specified as $t_{d(on)} + t_r$ and $t_{d(off)} + t_f$.