



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 $T_A = 25\text{ }^\circ\text{C}$, 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	$T_A = 25\text{ }^\circ\text{C}$	I_D	0.47	A
	See Notes		0.37 ^a	
Pulsed Drain Current		I_{DM}	1.0	0.5
Power Dissipation	$T_A = 25\text{ }^\circ\text{C}$	P_D	0.8	0.4
	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	$^\circ\text{C}$
Maximum Junction-to-Ambient	R_{thJA}	156	312.5	$^\circ\text{C/W}$

Notes:

a. I_D and P_D at 70 $^\circ\text{C}$.

b. I_D and P_D at 100 $^\circ\text{C}$.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, 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	$V_{GS} = 10\text{ V}$	$I_{D(on)}$	0.8			1		A
Drain-Source On-Resistance	$V_{GS} = 10\text{ V}$	$r_{Ds(on)}$	1.1	2.0		2.4	5	Ω
	$V_{GS} = 4.5\text{ V}$		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 $t_{d(off)} + t_f$.

Specification comparisons are supplied as a courtesy to compare two devices and do not constitute a commercial product datasheet or any guarantee of identical performance. Designers should refer to the appropriate datasheets of the same number for guaranteed specification limits.