

Ordering number: EN1636D

SANYO	No.1636D	CMOS LSI
		LC7818
Function Switch		

Use

Function switchover of amplifier, receiver, etc. and tape monitor control

Features

- (1) 2-channel 5-position source select + tape monitor on chip
- (2) Control input pins of input/output common type (Key input and LED display)
- (3) Delivers audio muting control signal.
- (4) Possible to select operation modes of backup mode, initialization mode, automatic switchover of function
- (5) Supply voltage $\pm 20V$, single-supply operation available

Absolute Maximum Ratings at $T_a = 25^\circ C, V_{SS} = 0V$

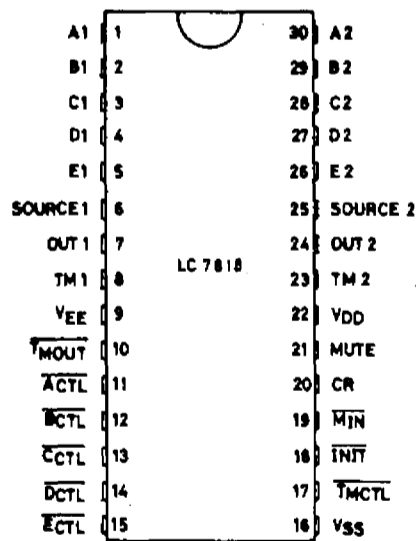
				unit	
Maximum Supply Voltage	$V_{DD} \text{ max}$	V_{DD}	$V_{EE} \leq V_{SS}$	$V_{SS} - 0.3 \text{ to } +20$	V
	$V_{EE} \text{ max}$	V_{EE}		$-20 \text{ to } V_{SS} + 0.3$	V
Output Voltage	V_{OUT}	\overline{ACTL} to \overline{ECTL}		$V_{SS} - 0.3 \text{ to } V_{DD} + 0.3$	V
		\overline{TMOUT}			
Output Current	I_{OUT}	"		30	mA
Voltage Difference at Analog Switch-ON Mode	ΔV_{on}	Switch ON		0.5	V
Allowable Power Dissipation	$P_d \text{ max}$	$T_a \leq 85^\circ C$		500	mW
Operating Temperature	T_{opg}			-30 to +75	$^\circ C$
Storage Temperature	T_{stg}			-40 to +125	$^\circ C$

Allowable Operating Conditions at $T_a = 25^\circ C, V_{SS} = 0V, |V_{DD}| \geq |V_{EE}|$

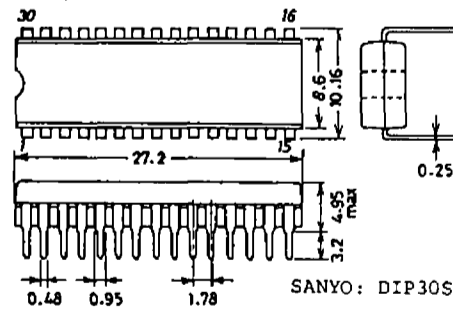
				min	typ	max	unit
Supply Voltage	V_{DD1}	V_{DD}	$V_{DD} - V_{EE} \geq 12V$	$V_{SS} + 6$	$V_{SS} + 18.5$		V
	V_{EE}	V_{EE}		$V_{SS} - 18.5$	V_{SS}		V
	V_{DD2}	V_{DD}	$V_{EE} \leq V_{SS} \text{ backup}$	$V_{SS} + 3$	$V_{SS} + 18.5$		V

Continued on next page.

Pin Assignment



Package Dimensions 3047A (unit: mm)



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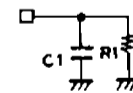
			min	typ	max	unit
Input "H" Level Voltage	V_{IH}	\overline{ACTL} to \overline{ECTL} , \overline{TMCTL}	$0.7V_{DD}$		V_{DD}	V
		$\overline{M1n}$	$V_{DD}-1.0$		V_{DD}	V
		\overline{INIT}	$V_{SS}+3.0$		V_{DD}	V
Input "L" Level Voltage	V_{IL}	\overline{ACTL} to \overline{ECTL} , \overline{TMCTL}	V_{SS}	$0.25V_{DD}$		V
		$\overline{M1n}$	V_{SS}	$V_{SS}+1.0$		V
		\overline{INIT}	V_{SS}	$V_{SS}+0.5$		V
Input "M" Level Voltage	V_{IM}	$\overline{M1n}$	$0.45V_{DD}$	$0.55V_{DD}$		V
Analog Switch Input Voltage Range	V_{IN}	A1 to E1, A2 to E2 SOURCE1,2 TM1,2	V_{EE}		V_{DD}	V

Electrical Characteristics at $T_a = 25^\circ\text{C}, V_{SS} = 0\text{V}, |V_{DD}| \geq |V_{EE}|$

				min	typ	max	unit
Output "H" Level Voltage	V_{OH}	MUTE	$I_{OH} = -0.4\text{mA}, V_{DD} \geq 9\text{V}$	$V_{DD}-0.5$		V_{DD}	V
Output "L" Level Voltage	V_{OL1}	\overline{ACTL} to \overline{ECTL} \overline{TMOUT}	$I_{OL} = 30\text{mA}, V_{DD} = 18\text{V}$	0		2	V
	V_{OL2}	MUTE	$I_{OL} = 0.4\text{mA}, V_{DD} \geq 9\text{V}$	0		0.5	V
Analog Switch-ON Resistance	R_{on}	A1 to E1, A2 to E2 TM1, TM2	$I = 1\text{mA}, V_{DD} - V_{EE} = 12\text{V}$ $I = 1\text{mA}, V_{DD} - V_{EE} = 18\text{V}$		120		Ω
		OUT1, OUT2	$I = 1\text{mA}, V_{DD} - V_{EE} = 37\text{V}$		70		Ω
Input/Output OFF Leak Current	I_{OFF1}	\overline{ACTL} to \overline{ECTL} \overline{TMOUT}	$V_0 = V_{SS} + 18\text{V}$			10	μA
	I_{OFF2}	CR	$V_0 = V_{SS} + 18\text{V}$			1	μA
	I_{OFF3}	A1 to E1, A2 to E2 TM1, 2, OUT1, 2	Analog SW OFF $V_{IN} = V_0 = V_{EE} \text{ to } V_{EE} + 37\text{V}$	-1		1	μA
Total Harmonic Distortion	THD	SOURCE1, 2 OUT1, 2	$V_{IN} = 1\text{V}_{rms}, f = 1\text{kHz},$ $V_{DD} - V_{EE} = 15 \text{ to } 37\text{V}$	0.0015	0.01		%
Feedthrough	FTH	A1 to E1 SOURCE1 OUT1 A2 to E2 SOURCE2 OUT2	$V_{DD} - V_{EE} = 37\text{V}, f = 10\text{kHz}$ $V_{IN} = 0.77\text{V}_{rms}$ $R_L = 47\text{k}\Omega$		55		dB
Crosstalk	CT	A1 to E1 SOURCE2 OUT2 A2 to E2 SOURCE1 OUT1	$V_{DD} - V_{EE} = 37\text{V}, f = 10\text{kHz}$ $V_{IN} = 0.77\text{V}_{rms}$ $R_L = 47\text{k}\Omega$		75		dB
Current Dissipation	I_{DD}	V_{DD}	Operating mode $V_{DD} - V_{EE} = 37\text{V}$			1	mA
Muting Time	T_M	MUTE			OSC period x 21		
Input Accept Pulse Width (Switch Select)	$T_{IN(1)}$	\overline{ACTL} to \overline{ECTL} \overline{TMCTL}			OSC period x 3		
Input Accept Pulse Width (Muting Output)	$T_{IN(2)}$	\overline{ACTL} to \overline{ECTL} \overline{TMCTL}			OSC period x 1		
External Capacitance for CR OSC	C_1	CR		0.001		0.1	μF
OSC Period	T_1	CR	$V_{DD} - V_{SS} = 6\text{V}$	$0.4C_1R_1$	$0.7C_1R_1$		
	T_2	CR	$V_{DD} - V_{SS} = 18.5\text{V}$	$0.3C_1R_1$	$0.6C_1R_1$		
Current Dissipation	I_{DD} back up	V_{DD}	back up $V_{DD} = 5\text{V}, V_{EE} = V_{SS} = 0\text{V}$			1	μA

Operation caused by combination of INIT, Min inputs

INIT	Min	Operation
H	M	Normal
H	L	Backup
H	H	Auto function
L	M	Muting
L	L	Initialize (A circuit)
L	H	Reset



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Pin Description

Pin Name	Pin No.	Input/Output Configuration	Function
VDD VSS VEE	22 16 9		<ul style="list-style-type: none"> Power supply pin Single supply (+): VSS=VEE=GND Dual supply (±): VSS=GND, VEE=(-)V
A1, B1 C1, D1 E1, TM1 A2, B2 C2, D2 E2, TM2 SOURCE1 SOURCE2 OUT1 OUT2	1, 2 3, 4 5, 8 30, 29 28, 27 26, 23 6 25 7 24		<ul style="list-style-type: none"> A to E, TM: Audio signal input pin SOURCE: Output pin for REC OUT: Audio signal output pin
TMOUT	10		<ul style="list-style-type: none"> TM ON/OFF-state display LED driver output
ACTL BCTL CCTL DCTL ECTL	11 12 13 14 15		<ul style="list-style-type: none"> Input/output pin for analog switch control and its state display LED driver output
TMCTL	17		<ul style="list-style-type: none"> Input pin for TM control
INIT	18		<ul style="list-style-type: none"> Input pin for mode setting (Details are given on page 2.)
MIN	19		<ul style="list-style-type: none"> Input pin for mode setting (Details are given on page 2.)
CR	20		<ul style="list-style-type: none"> Input/output pin for clock generation C1, R1 are connected.
MUTE	21		<ul style="list-style-type: none"> Output pin for muting control

Note: Priority for simultaneous push of keys is given as shown below.

TMCTL > ACTL > BCTL > CCTL > DCTL > ECTL

The pin (ACTL to ECTL pins) whose LED driver is turned ON (function selected) does not accept key input. Key input to such pin causes no operation to occur.

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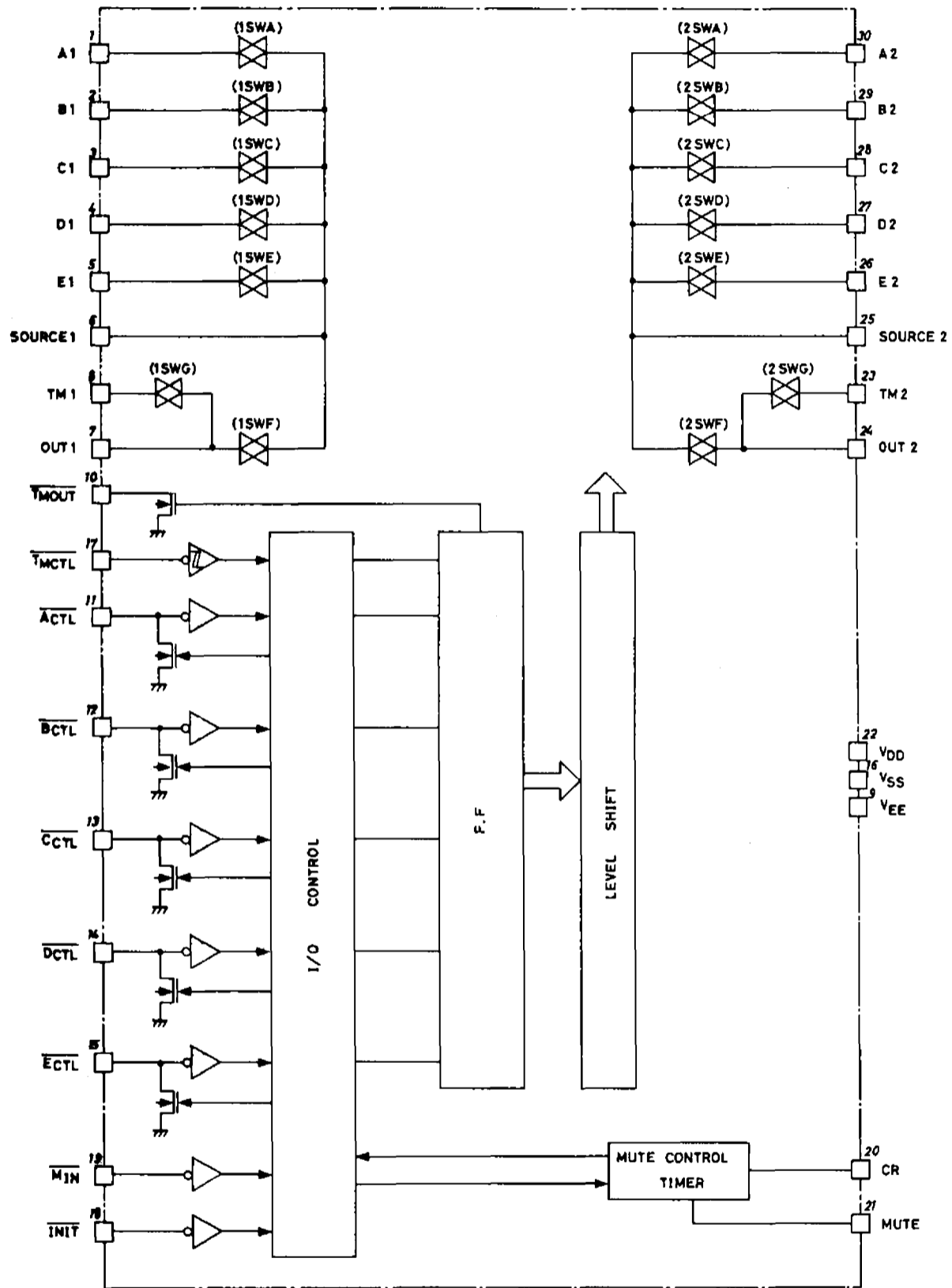
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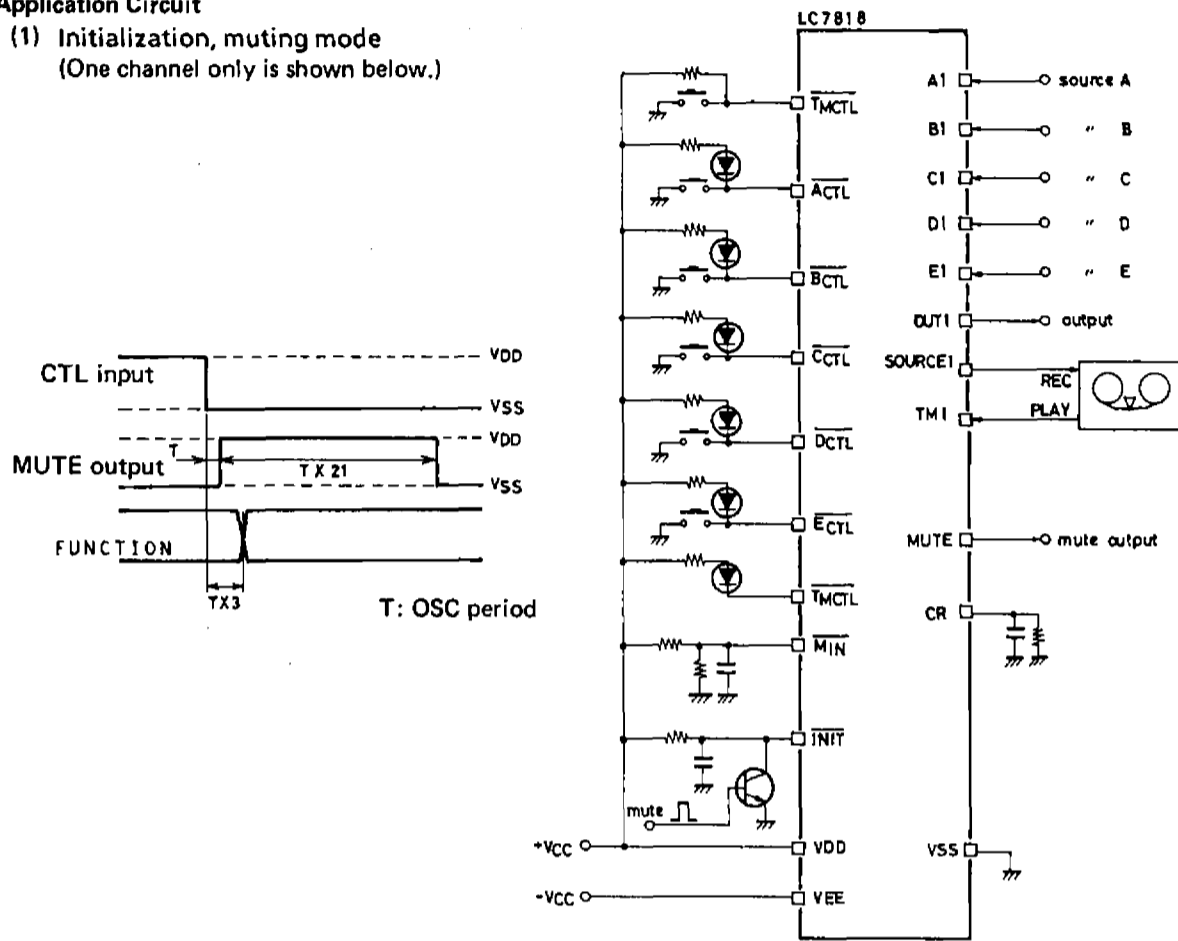
Equivalent Circuit Block Diagram



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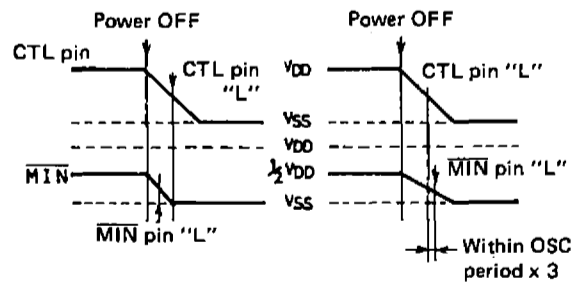
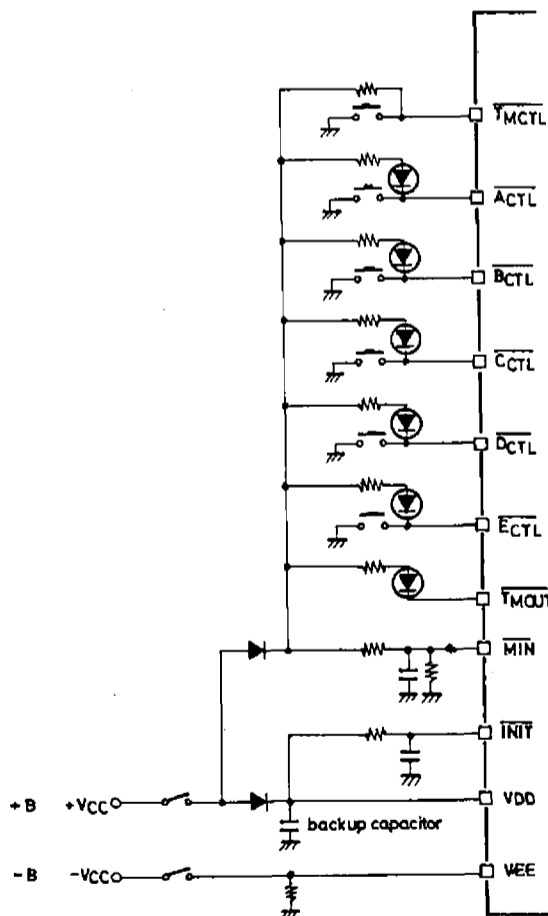
Application Circuit

(1) Initialization, muting mode
(One channel only is shown below.)



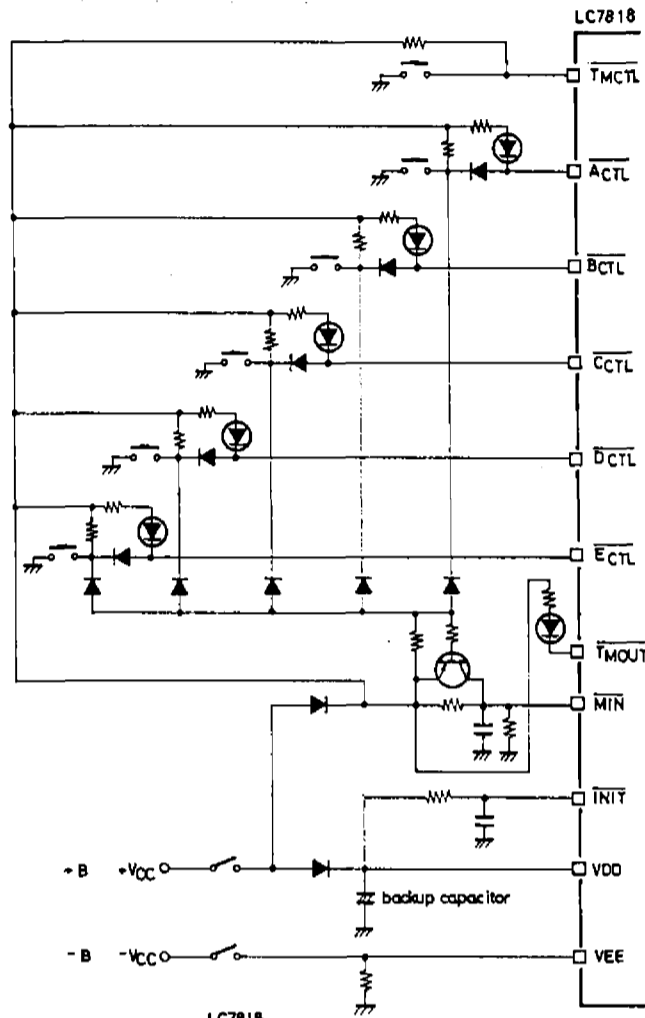
(2) Backup mode
(Audio section, MUTE circuit are omitted.)

If the power switch is set to the primary side at the backup mode and it takes time for +B to fall when power is turned OFF, the MIN pin must be brought to "L" state before the ACTL to ECTL, TMCTL pins are brought to "L" state or the MIN pin must be brought to "L" state within OSC period x 3 in case the ACTL to ECTL, TMCTL pins are brought to "L" state earlier; otherwise the function may be shifted to another.

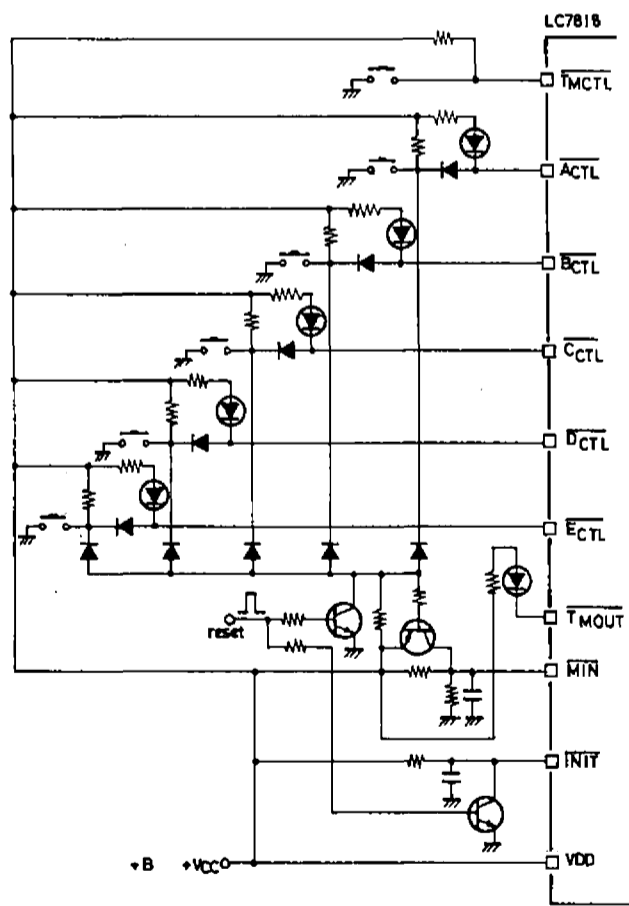


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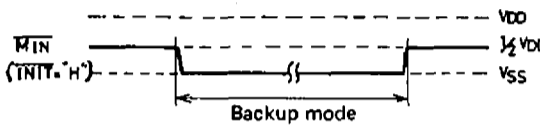
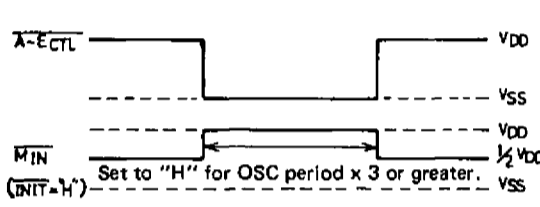
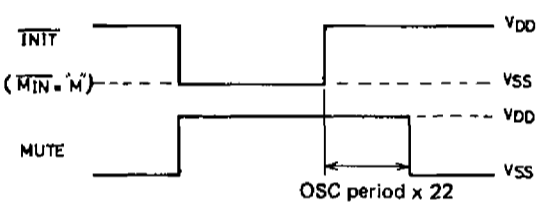
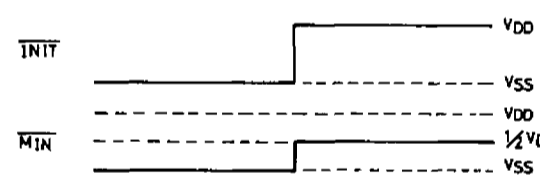
(3) Auto function, backup mode



(4) Auto function, initialization, reset mode



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INIT	MIN	Operation	Description
H	M	Normal	<ul style="list-style-type: none"> This state is kept at the normal operation mode.
H	L	Backup mode	<ul style="list-style-type: none"> The backup mode is entered at this state. 
H	H	Auto function (TM reset)	<ul style="list-style-type: none"> When the \overline{ACTL} to \overline{ECTL} input occurs, set to this state. 
L	M	Muting	<ul style="list-style-type: none"> When applying muting regardless of the function select key, set to this state. 
L	L	Initialization (A circuit ON)	<ul style="list-style-type: none"> The TM is turned OFF and the A circuit is turned ON.  <ul style="list-style-type: none"> To initialize, hold this state for OSC period x 3 or greater.
L	H	Reset	<ul style="list-style-type: none"> All input circuits are turned OFF. 