

CMOS LSI

LC7818

SANYO

No.1636D

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 $T_a = 25^\circ\text{C}, V_{SS} = 0\text{V}$

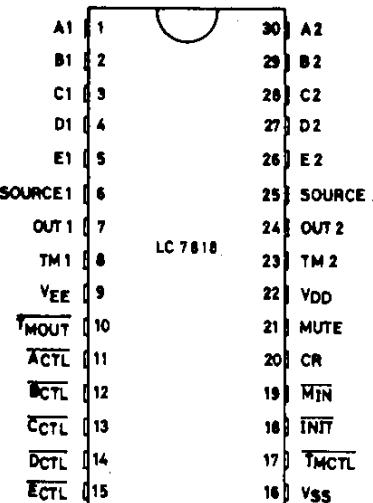
| Absolute Maximum Ratings at $T_a = 25^\circ\text{C}$, $V_{SS} = 0\text{V}$ | | | | Unit |
|---|----------------------|--|----------------------|---|
| Maximum Supply Voltage | $V_{DD \text{ max}}$ | V_{DD} | $V_{EE} \leq V_{SS}$ | $V_{SS} - 0.3 \text{ to } + 20$ |
| | $V_{EE \text{ max}}$ | V_{EE} | | $- 20 \text{ to } V_{SS} + 0.3$ |
| Output Voltage | V_{OUT} | \overline{ACTL} to \overline{ECTL} \overline{TMOUT} | | $V_{SS} - 0.3 \text{ to } V_{DD} + 0.3$ |
| Output Current | I_{OUT} | " | | 30 mA |
| Voltage Difference at Analog Switch-ON Mode | ΔV_{on} | Switch ON | | 0.5 V |
| Allowable Power Dissipation | $P_d \text{ max}$ | $T_a \leq 85^\circ\text{C}$ | | 500 mW |
| Operating Temperature | T_{opg} | | | $- 30 \text{ to } + 75$ °C |
| Storage Temperature | T_{stg} | | | $- 40 \text{ to } + 125$ °C |

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

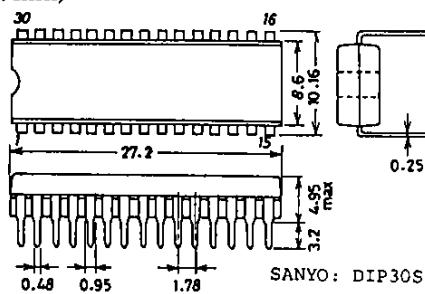
| | | | | | | |
|-----------------------|-----------|----------|-----------------------------|-----------------|-----------------|----------|
| Supply Voltage | V_{DD1} | V_{DD} | $V_{DD} - V_{EE} \geq 12V$ | $V_{SS} + 6$ | $V_{SS} + 18.5$ | V_{SS} |
| | V_{EE} | V_{EE} | | $V_{SS} - 18.5$ | | V_{SS} |
| | V_{DD2} | V_{DD} | $V_{EE} \leq V_{SS}$ backup | $V_{SS} + 3$ | $V_{SS} + 18.5$ | V_{SS} |

Continued on next page.

Pin Assignment



Package Dimensions 3047A
(unit : mm)



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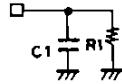
| | | | min | typ | max | unit |
|--------------------------------------|-----|---------------------------------------|-----------|-----------|-----|------|
| Input "H" Level Voltage | VIH | <u>ACTL to ECTL</u> , <u>TMCTL</u> | 0.7VDD | | VDD | V |
| | | <u>Min</u> | VDD - 1.0 | | VDD | V |
| | | <u>INIT</u> | VSS + 3.0 | | VDD | V |
| Input "L" Level Voltage | VIL | <u>ACTL to ECTL</u> , <u>TMCTL</u> | VSS | 0.25VDD | V | V |
| | | <u>Min</u> | VSS | VSS + 1.0 | V | V |
| | | <u>INIT</u> | VSS | VSS + 0.5 | V | V |
| Input "M" Level Voltage | VIM | <u>Min</u> | 0.45VDD | 0.55VDD | V | V |
| Analog Switch Input Voltage Range | VIN | A1 to E1, A2 to E2 SOURCE1,2 TM1,2 | VEE | | VDD | 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 | VOH | MUTE | $I_{OH} = -0.4\text{mA}$, $V_{DD} \geq 9\text{V}$ | VDD - 0.5 | VDD | V |
| Output "L" Level Voltage | VOL1 | <u>ACTL to ECTL</u> , <u>TMOUT</u> | $I_{OL} = 30\text{mA}$, $V_{DD} = 18\text{V}$ | 0 | 2 | V |
| | VOL2 | MUTE | $I_{OL} = 0.4\text{mA}$, $V_{DD} \geq 9\text{V}$ | 0 | 0.5 | V |
| Analog Switch-ON Resistance | Ron | A1 to E1, A2 to E2 TM1, TM2 OUT1, OUT2 | $I = 1\text{mA}$, $V_{DD} - V_{EE} = 12\text{V}$ $I = 1\text{mA}$, $V_{DD} - V_{EE} = 18\text{V}$ $I = 1\text{mA}$, $V_{DD} - V_{EE} = 37\text{V}$ | 120 | Ω | |
| Input/Output OFF Leak Current | IOFF1 | <u>ACTL to ECTL</u> , <u>TMOUT</u> | $V_0 = V_{SS} + 18\text{V}$ | | 10 | μA |
| | IOFF2 | CR | $V_0 = V_{SS} + 18\text{V}$ | | 1 | μA |
| | IOFF3 | 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 | $V_{IN} = 1\text{V}_{\text{rms}}$, $f = 1\text{kHz}$, $V_{DD} - V_{EE} = 15 \text{ to } 37\text{V}$ | 0.0015 | 0.01 | % |
| Feedthrough | FTH | A1 to E1 SOURCE1 OUT1 A2 to E2 SOURCE2 OUT2 | $V_{DD} - V_{EE} = 37\text{V}$, $f = 10\text{kHz}$ $V_{IN} = 0.77\text{V}_{\text{rms}}$ $RL = 47\text{k}\Omega$ | 55 | | dB |
| Crosstalk | CT | A1 to E1 SOURCE2 OUT2 A2 to E2 SOURCE1 OUT1 | $V_{DD} - V_{EE} = 37\text{V}$, $f = 10\text{kHz}$ $V_{IN} = 0.77\text{V}_{\text{rms}}$ $RL = 47\text{k}\Omega$ | 75 | | dB |
| Current Dissipation | IDD | VDD | Operating mode $V_{DD} - V_{EE} = 37\text{V}$ | | 1 | mA |
| Muting Time | TM | MUTE | | | | OSC period x 21 |
| Input Accept Pulse Width (Switch Select) | TIN(1) | <u>ACTL to ECTL</u> , <u>TMCTL</u> | | | | OSC period x 3 |
| Input Accept Pulse Width (Muting Output) | TIN(2) | <u>ACTL to ECTL</u> , <u>TMCTL</u> | | | | OSC period x 1 |
| External Capacitance for CR OSC | C1 | CR | | 0.001 | 0.1 | μF |
| OSC Period | T1 | CR | $V_{DD} - V_{SS} = 6\text{V}$ | 0.4C1R1 | 0.7C1R1 | |
| | T2 | CR | $V_{DD} - V_{SS} = 18.5\text{V}$ | 0.3C1R1 | 0.6C1R1 | |
| Current Dissipation | IDD back up | VDD | $\begin{cases} \text{back up} \\ V_{DD} = 5\text{V}, V_{EE} = V_{SS} = 0\text{V} \end{cases}$ | | 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 |



Pin Description

| Pin Name | Pin No. | Input/Output Configuration | Function |
|---------------------------------|---------|----------------------------|--|
| V _{DD} | 22 | | • Power supply pin Single supply (+): V _{SS} =V _{EE} =GND Dual supply (±): V _{SS} =GND, V _{EE} =(-)V |
| V _{SS} | 16 | | |
| V _{EE} | 9 | | |
| A ₁ ,B ₁ | 1,2 | | |
| C ₁ ,D ₁ | 3,4 | An | |
| E ₁ ,TM ₁ | 5,8 | Bn | |
| A ₂ ,B ₂ | 30,29 | Cn | |
| C ₂ ,D ₂ | 28,27 | Dn | |
| E ₂ ,TM ₂ | 26,23 | En | |
| SOURCE ₁ | 6 | SOURCE _n | |
| SOURCE ₂ | 25 | TM _n | |
| OUT ₁ | 7 | OUT _n | |
| OUT ₂ | 24 | | |
| TMOUT | 10 | | • TM ON/OFF-state display LED driver output |
| ACTL | 11 | | |
| BCTL | 12 | | |
| CCTL | 13 | | • Input/output pin for analog switch control and its state display LED driver output |
| DCTL | 14 | | |
| ECTL | 15 | | |
| TMCTL | 17 | | • Input pin for TM control |
| INIT | 18 | | • Input pin for mode setting (Details are given on page 2.) |
| MIN | 19 | | • Input pin for mode setting (Details are given on page 2.) |
| CR | 20 | | • Input/output pin for clock generation C ₁ , R ₁ are connected.  |
| MUTE | 21 | | • Output pin for muting control |

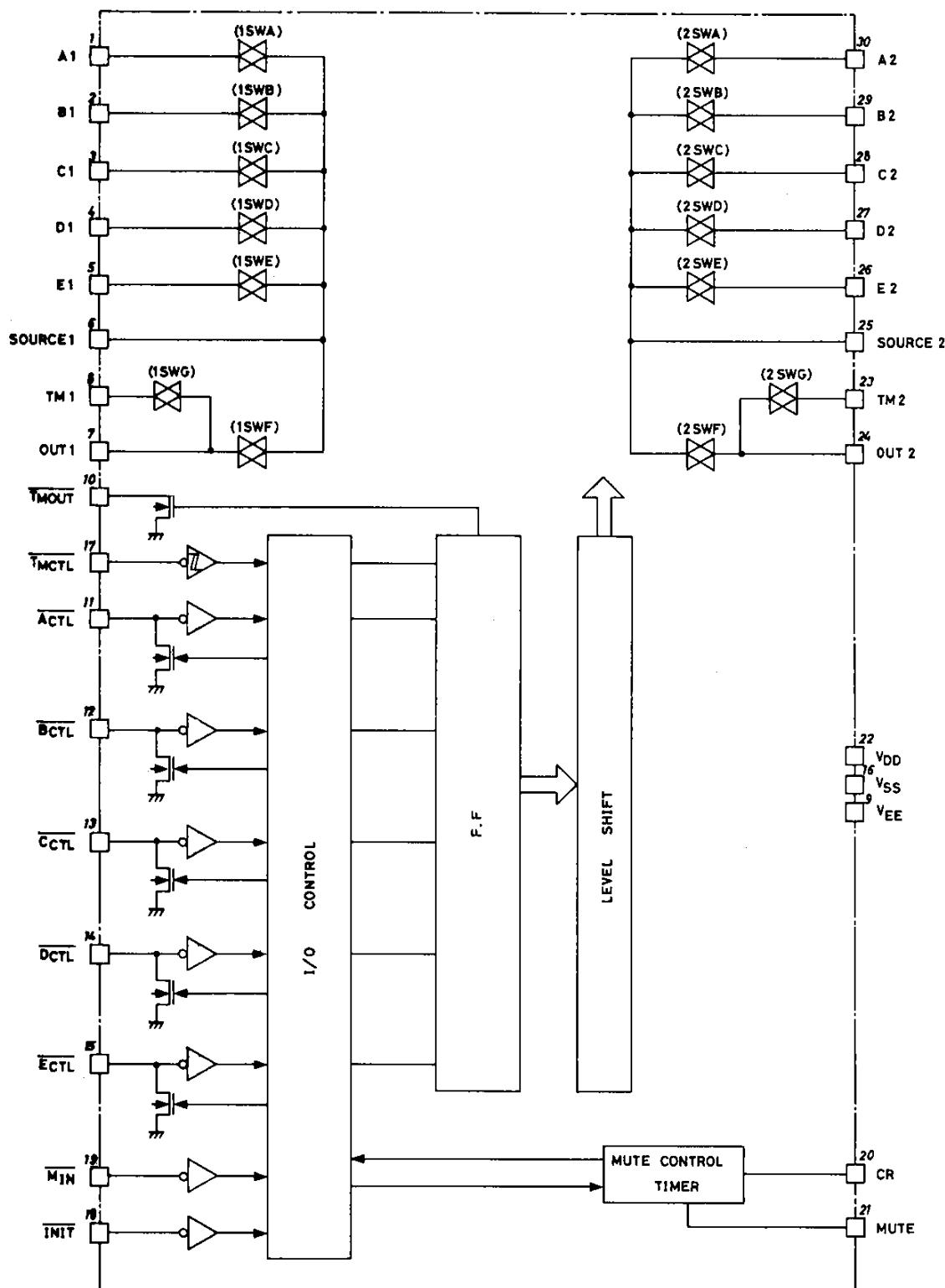
Note: Priority for simultaneous push of keys is given as shown below.

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.

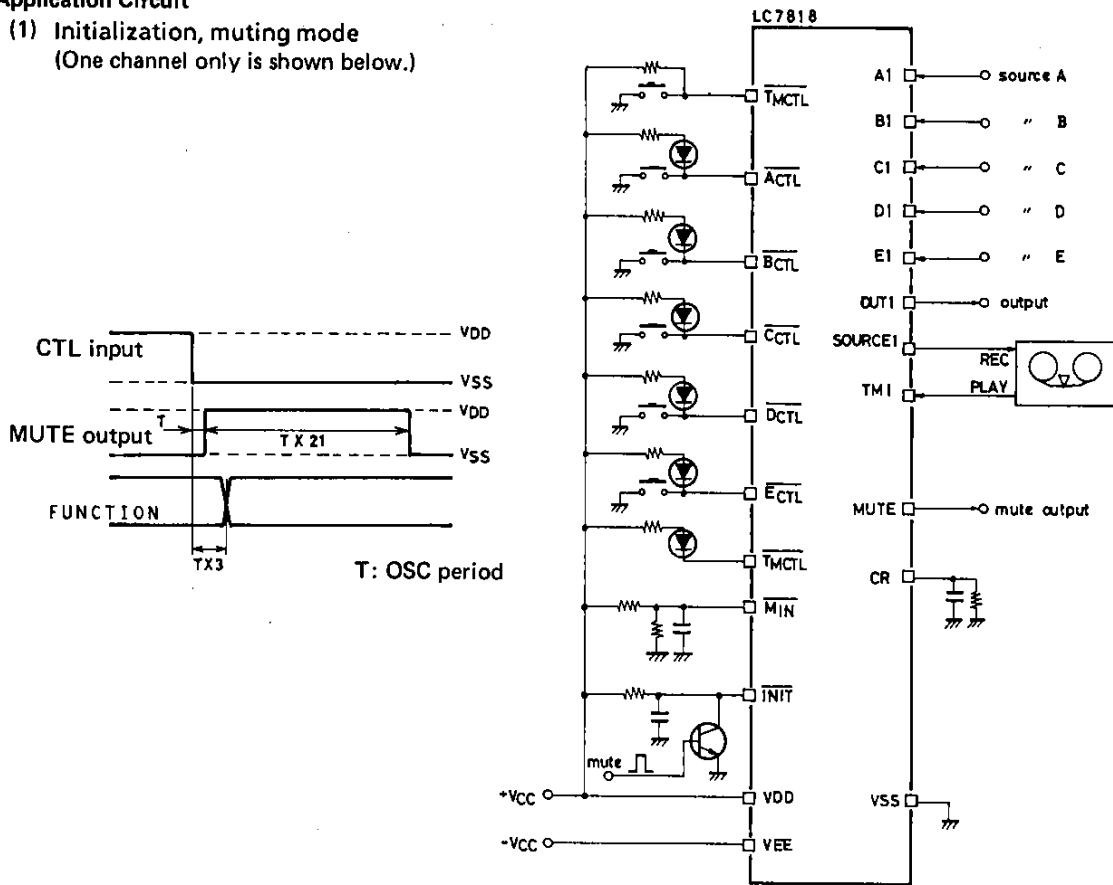
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Equivalent Circuit Block Diagram

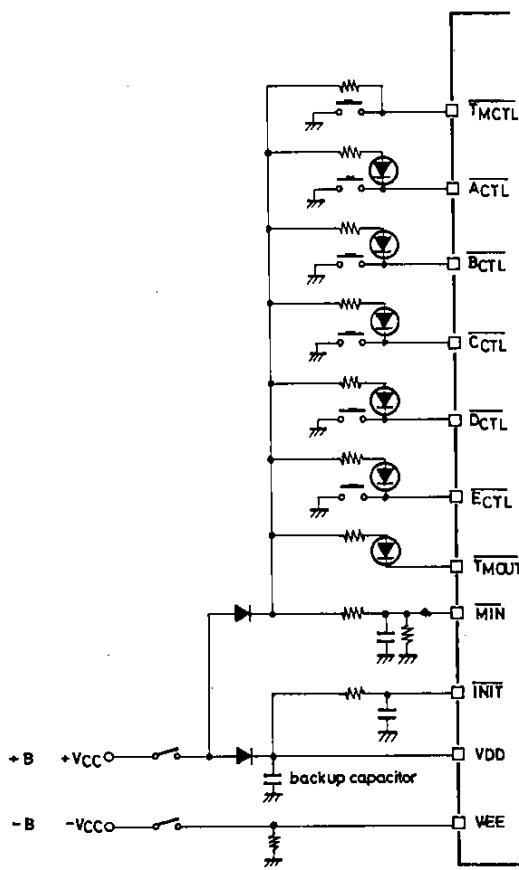


Application Circuit

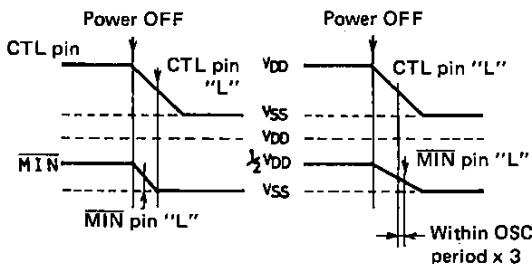
- (1) Initialization, muting mode
(One channel only is shown below.)

**(2) Backup mode**

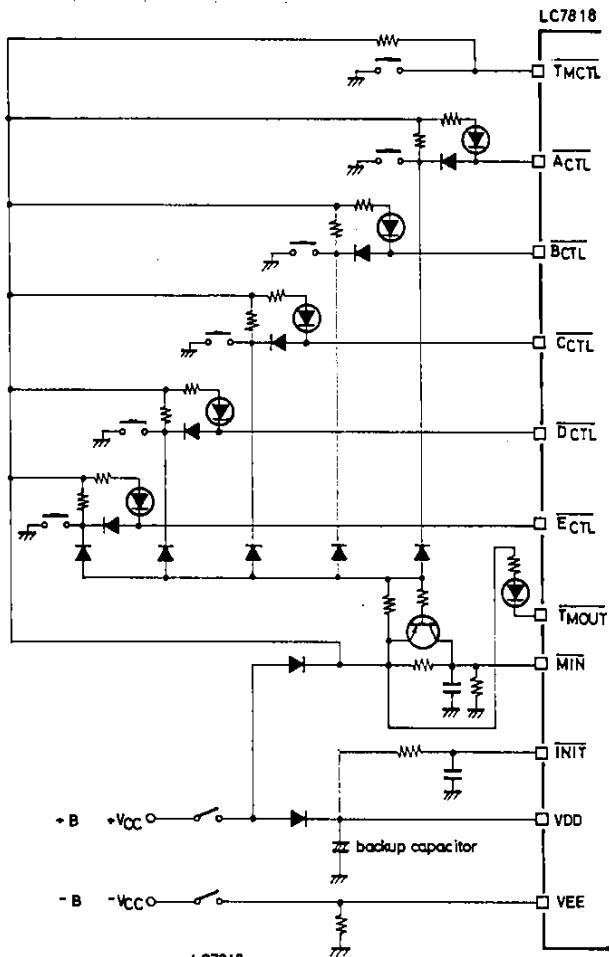
(Audio section, MUTE circuit are omitted.)



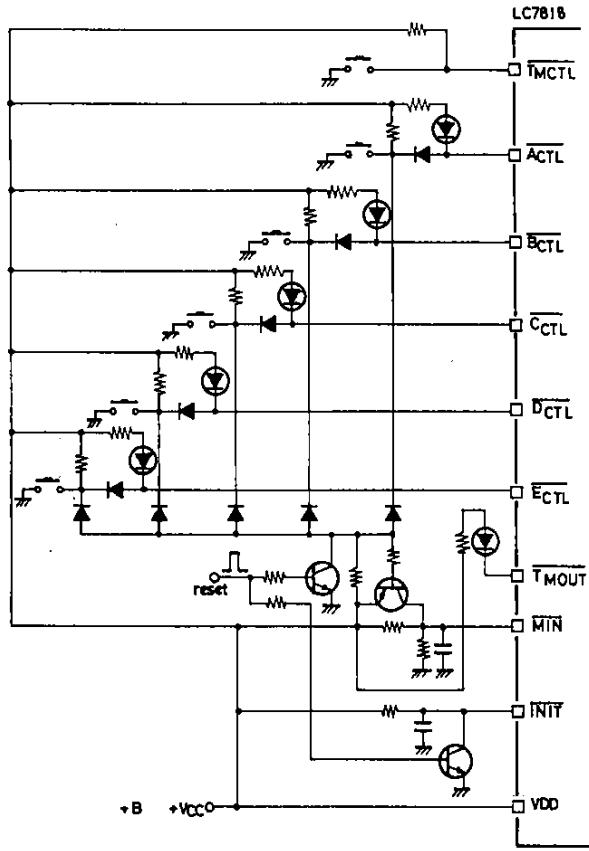
If the power switch is set to the primary side at the backup mode and it takes time for +B to fall when power is turned OFF, the MIN pin must be brought to "L" state before the ACTL to ECTL, TMCTL pins are brought to "L" state or the MIN pin must be brought to "L" state within OSC period $\times 3$ in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

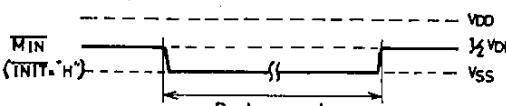
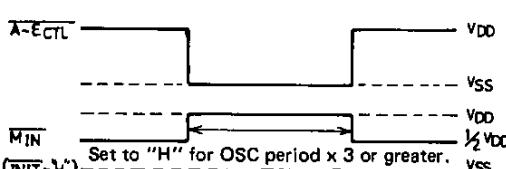
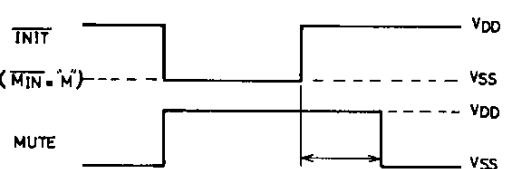
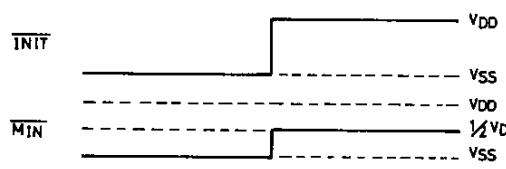
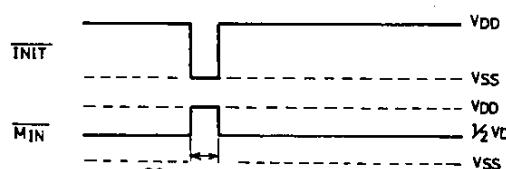


(3) Auto function, backup mode



(4) Auto function, initialization, reset mode



| 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 ACTL to 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.  <p>To initialize, hold this state for OSC period x 3 or greater.</p> |
| L | H | Reset | <ul style="list-style-type: none"> All input circuits are turned OFF.  <p>20μsec. or greater.</p> |