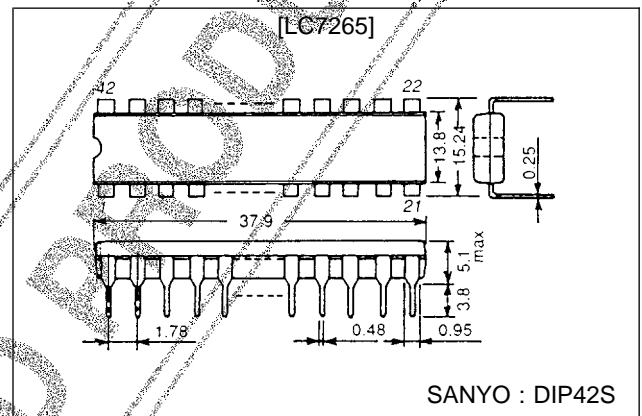


**SANYO****LC7265****Received Frequency Display for Radio Receivers****Features**

- Displays received frequency of each band of FM, MW, LW (LED static display).
- Counts local oscillation frequency and displays received frequency.
- Number of display digits : FM-5 digits, MW-4 digits, LW-3 digits.
- Covers intermediate frequencies shown below.
  - FM : +10.700, +10.725, +10.750, +10.675 MHz  
-10.700, -10.725, -10.675, -10.650 MHz
  - MW, LW : +450 kHz : 10 kHz step display  
+450 kHz : 1 kHz step display  
+455 kHz : 1 kHz step display  
+469 kHz : 1 kHz step display
- Contains blanking circuit to turn off display.
- Contains hold circuit to hold display contents.
- Uses crystal resonator having 7.2 MHz reference frequency.
- Uses LB3500 ( $\div 8$  prescaler) jointly at the time of FM reception.
- Supply voltage  $V_{DD}$  : 4.5 V to 10 V

**Package Dimensions**

unit : mm

**3025B-DIP42S****Specifications****Absolute Maximum Ratings at  $T_a = 25^\circ\text{C}$ ,  $V_{SS} = 0\text{ V}$** 

| Parameter                                      | Symbol              | Conditions   | Ratings              | Unit             |
|--|---------------------|--|----------------------|------------------|
| Maximum supply voltage                         | $V_{DD\text{ max}}$ |  | -0.3 to +11          | V                |
| Input voltage                                  | $V_{IN}$            | All input pins   | -0.3 to $V_{DD}+0.3$ | V                |
| Output voltage                                 | $V_{O1}$            | $X_{OUT}$ , HLD, 50 Hz, output: off                        | -0.3 to $V_{DD}+0.3$ | V                |
|  | $V_{O2}$            | Output pins other than $V_{O1}$                            | 0 to 15              | V                |
| Allowable power dissipation                    | $P_d\text{ max}$    | $T_a \leq 65^\circ\text{C}$                                | 550                  | mW               |
| Allowable power dissipation of segment outputs | $P_d$ (seg)1        | MHZ, b&c, b&e, $V_{DD} = 4.5$ to 6.5 V, $I_{OL} = 33$ mA   | 30                   | mW               |
|  | $P_d$ (seg) 2       | Other outputs, $V_{DD} = 4.5$ to 6.5 V, $I_{OL} = 16.5$ mA | 15                   | mW               |
|  | $P_d$ (seg) 3       | MHZ, b&c, b&e, $V_{DD} = 6.0$ to 10 V, $I_{OL} = 36$ mA    | 25                   | mW               |
|  | $P_d$ (seg) 4       | Other outputs, $V_{DD} = 6.0$ to 10 V, $I_{OL} = 18$ mA    | 12                   | mW               |
| Operating temperature                          | $T_{opr}$           |  | -30 to +65           | $^\circ\text{C}$ |
| Storage temperature                            | $T_{stg}$           |  | -40 to +125          | $^\circ\text{C}$ |

**SANYO Electric Co.,Ltd. Semiconductor Business Headquarters**

TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

63098HA(II)/6088YT/9105KI/3173KI/D162KI/7162KI/6242KI,TS No.1197-1/6

# LC7265

## Allowable Operating Ranges at $T_a = 25\text{ }^\circ\text{C}$ , $V_{DD} = 4.5\text{ to }10\text{ V}$ , $V_{SS} = 0\text{ V}$

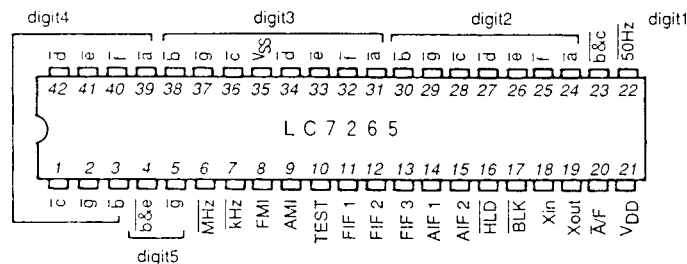
| Parameter                | Symbol    | Conditions  | min         | typ | max         | Unit |
|--------------------------|-----------|---|-------------|-----|-------------|------|
| Supply voltage           | $V_{DD}$  |   | 4.5         |     | 10          | V    |
| Input high-level voltage | $V_{IH1}$ | $\overline{A/F}$ , $\overline{BLK}$   | $0.7V_{DD}$ |     | $V_{DD}$    | V    |
|                          | $V_{IH2}$ | FIF1, FIF2, FIF3, AIF1, AIF2  | $0.9V_{DD}$ |     | $V_{DD}$    | V    |
| Input low-level voltage  | $V_{IL1}$ | $\overline{A/F}$ , $\overline{BLK}$   | 0           |     | $0.3V_{DD}$ | V    |
|                          | $V_{IL2}$ | FIF1, FIF2, FIF3, AIF1, AIF2  | 0           |     | $0.1V_{DD}$ | V    |
| Input frequency          | $f_{IN1}$ | FMI, sine wave, capacitive coupling, $V_{IN1} = 0.7V_{p-p}$                         | 1           |     | 18          | MHz  |
|                          | $f_{IN2}$ | AMI, sine wave, capacitive coupling, $V_{IN2} = 0.5V_{p-p}^*$                       | 0.5         |     | 3           | MHz  |
|                          | $f_{IN3}$ | $X_{IN}$  | 0.2         |     | 7.5         | MHz  |
| Input amplitude          | $V_{IN1}$ | FMI, sine wave, capacitive coupling, $f_{IN1} = 1\text{ to }18\text{ MHz}$          | 0.7         |     | $0.9V_{DD}$ | Vp-p |
|                          | $V_{IN2}$ | AMI, sine wave, capacitive coupling, $f_{IN2} = 0.5\text{ to }3\text{ MHz}$         | 0.5*        |     | $0.9V_{DD}$ | Vp-p |
|                          | $V_{IN3}$ | $X_{IN}$ , sine wave, capacitive coupling, $f_{IN3} = 0.2\text{ to }7.5\text{ MHz}$ | 1.0         |     | $0.9V_{DD}$ | Vp-p |
| Segment current          | Iseg1     | MHz, b&e, b&c   | 0           |     | 30          | mA   |
|                          | Iseg2     | Other outputs   | 0           |     | 15          | mA   |

\*: For  $f_{IN2} = 0.5\text{ MHz to }0.9\text{ MHz}$  and  $V_{DD} = 8\text{ to }10\text{ V}$ ,  $V_{IN2\text{ min}} = 1.0\text{ Vp-p}$  applies.

## Electrical Characteristics at $T_a = 25\text{ }^\circ\text{C}$ , $V_{DD} = 4.5\text{ to }10\text{ V}$ , $V_{SS} = 0\text{ V}$

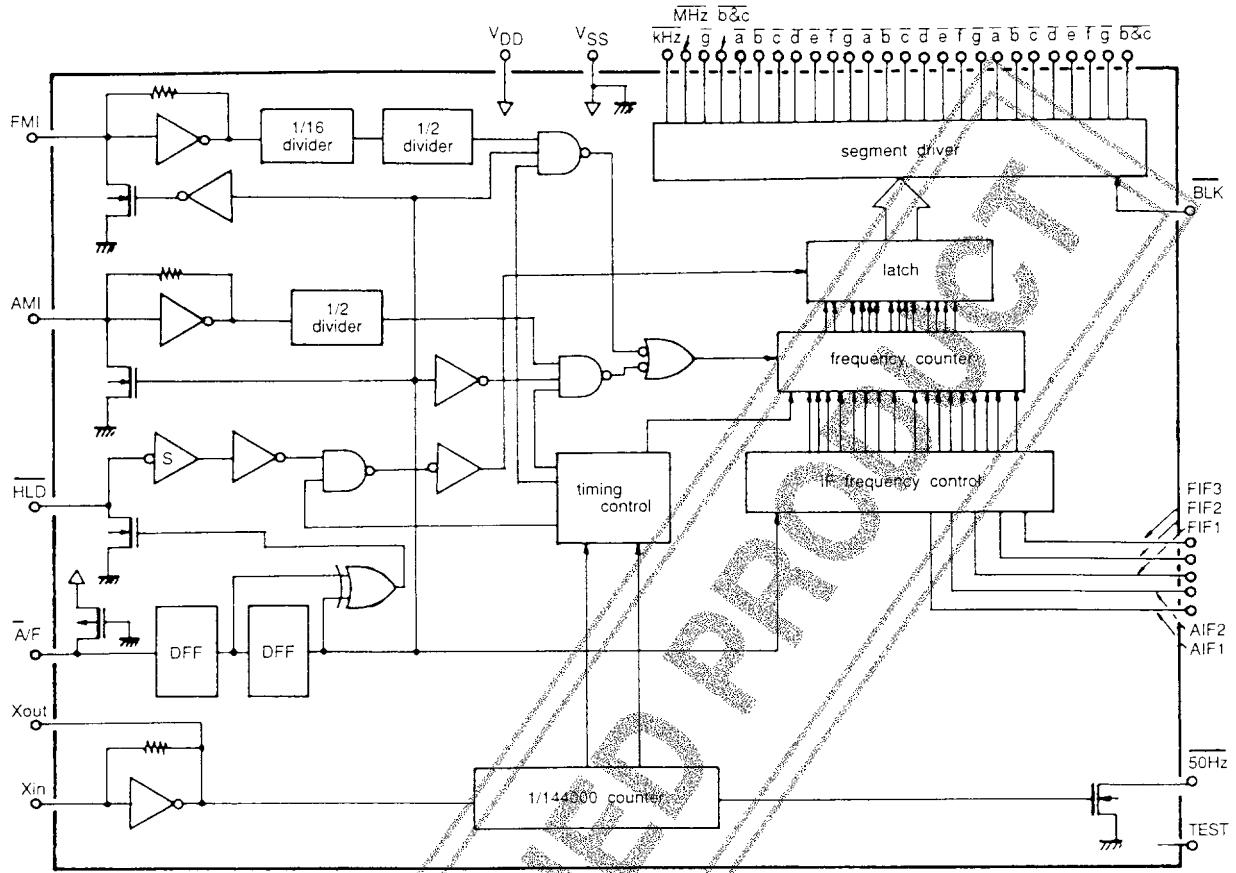
| Parameter                               | Symbol     | Conditions   | min         | typ         | max         | Unit          |
|---|------------|--|-------------|-------------|-------------|---------------|
| Input high-level current                | $I_{IH1}$  | FIF1, FIF2, FIF3, AIF1, AIF2 $V_I = V_{DD}$  | 0           |             | 10          | $\mu\text{A}$ |
|   | $I_{IH2}$  | $\overline{BLK}$ $V_I = V_{DD}$  | 0           |             | 2           | $\mu\text{A}$ |
| Input low-level current                 | $I_{IL1}$  | FIF1, FIF2, FIF3, AIF1, AIF2 $V_I = V_{SS}$  | 0           |             | 10          | $\mu\text{A}$ |
|   | $I_{IL2}$  | $\overline{BLK}$ $V_I = V_{SS}$  | 0           |             | 2           | $\mu\text{A}$ |
|   | $I_{IL3}$  | $\overline{A/F}$ $V_I = V_{SS}$  | 20          |             | 500         | $\mu\text{A}$ |
| Input floating voltage                  | $V_{IF}$   | $\overline{A/F}$ $V_I = \text{open}$   | $0.8V_{DD}$ |             | $V_{DD}$    | V             |
| Input/output high-level leakage current | $I_{OFF}$  | HLD, output off, $V_I = V_{DD}$  | 0           |             | 2           | $\mu\text{A}$ |
| Output low-level voltage                | $V_{OL1}$  | HLD, output on, $I_O = 1\text{ mA}$  | 0           |             | 1           | V             |
|   | $V_{OL2}$  | b&e, b&c, MHz $V_{DD} = 4.5\text{ to }10\text{ V}$ , $I_{OL} = 30\text{ mA}$   | 0           |             | 0.7         | V             |
|   | $V_{OL3}$  | Segments other than above $V_{DD} = 4.5\text{ to }10\text{ V}$ , $I_{OL} = 15\text{ mA}$   | 0           |             | 0.7         | V             |
|   | $V_{OL4}$  | 50 Hz, $I_O = 0.2\text{ mA}$   | 0           |             | 1.0         | V             |
| Input high-level threshold voltage      | $V_{th}$   | HLD  | $0.4V_{DD}$ | $0.5V_{DD}$ | $0.7V_{DD}$ | V             |
| Output off leakage current              | $I_{OFF2}$ | All segments output pins, $V_O = 13\text{ V}$ , output off   | 0           |             | 10          | $\mu\text{A}$ |
| Current drain                           | $I_{DD}$   | FM mode, $\overline{A/F} = \text{open or } V_{DD}$ , $f_{IN1} = 18\text{ MHz}$ , $0.7V_{p-p}$ or (AM mode, $\overline{A/F} = V_{SS}$ , $f_{IN2} = 3\text{ MHz}$ , $0.5V_{p-p}$ ) $f_{IN3} = 7.2\text{ MHz}$ , $1V_{p-p}$ FIF1, FIF2, FIF3 = $V_{DD}$ AIF1, AIF2 = $V_{DD}$ HLD, BLK = $V_{DD}$ other pins open | 0           |             | 18          | mA            |

## Pin Assignment



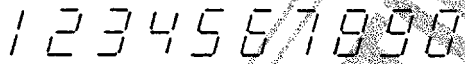
Top view

Equivalent Circuit Block Diagram



1. Display

1-1 Display font



1-2 Lighting system

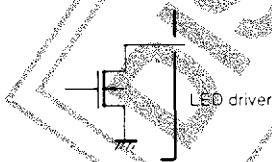
- Static lighting

1-3 Display range (High-order 1 digit; zero blanking)

- FM : 00.00 MHz to 199.95 MHz 50 kHz step
- MW, LW : 000 kHz to 1999 kHz 10 kHz or 1 kHz step

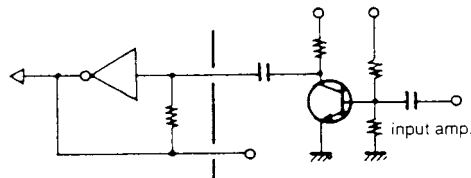
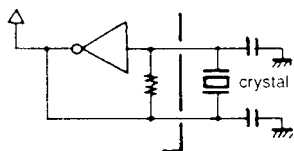
2. Pin Description

2-1 • a to g, b&c, b&e, MHz, kHz : LED



2-2 • VDD, VSS : Power supply pins

2-3 • XIN, XOUT : Crystal resonator or input amp pin



# LC7265

## 2-4 • FIF1, FIF2, FIF3 : FM IF select pins

|          |         |         |         |         |         |         |         |         |
|----------|---------|---------|---------|---------|---------|---------|---------|---------|
| FIF1     | 0       | 0       | 0       | 0       | 1       | 1       | 1       | 1       |
| FIF2     | 0       | 0       | 1       | 1       | 0       | 0       | 1       | 1       |
| FIF3     | 0       | 1       | 0       | 1       | 0       | 1       | 0       | 1       |
| IF (MHz) | +10.700 | +10.725 | +10.675 | +10.750 | -10.700 | -10.725 | -10.675 | -10.650 |

## 2-5 • AIF1, AIF2 : AM IF select pins

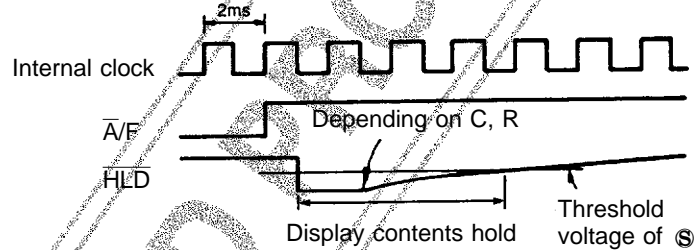
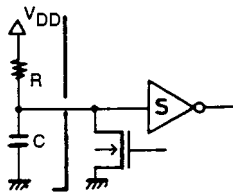
|          |          |          |      |      |
|----------|----------|----------|------|------|
| AIF1     | 0        | 0        | 1    | 1    |
| AIF2     | 0        | 1        | 0    | 1    |
| IF (kHz) | +450 (2) | +450 (1) | +455 | +469 |

1 : High level ( $V_{DD}$ )  
0 : Low level ( $V_{SS}$ )

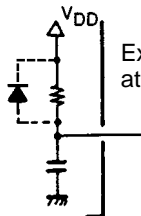
(Note) 450 kHz(1) : 10 kHz step display, others : 1 kHz step display

## 2-6 • $\overline{HLD}$ : Display contents hold pin

Normally, this pin is set at high level. To hold display contents, this pin is set at low level. Connecting time constant circuit to this pin makes it possible to hold display contents for a certain period of time at the time of FM/MW, LW band selection.



## 2-7 • $\overline{BLK}$ : Display blanking pin



Example of blanking misdisplay at the time of application of power.

## 2-8 • FMI, AMI : Local oscillation signal input pins

FMI — For FM : 0.7Vp-p input sensitivity

AMI — For MW, LW : 1.0Vp-p input sensitivity ( $V_{DD} = 8$  to  $10$  V,  $f_{IN} = 0.5$  to  $0.9$  MHz)

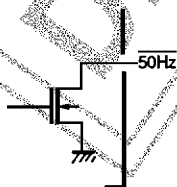
0.5Vp-p input sensitivity (other than above)

## 2-9 • $\overline{A/F}$ : FM/MW, LW select pin

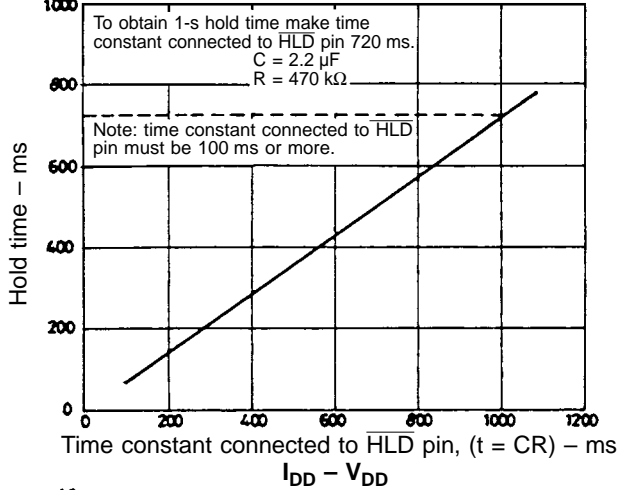
FM — Pin open or high level

MW, LW — Low level

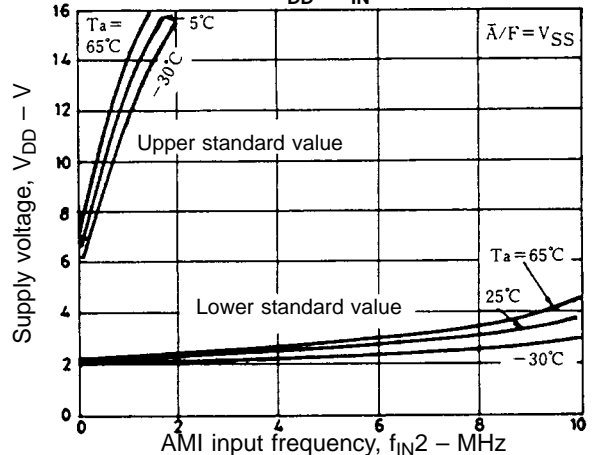
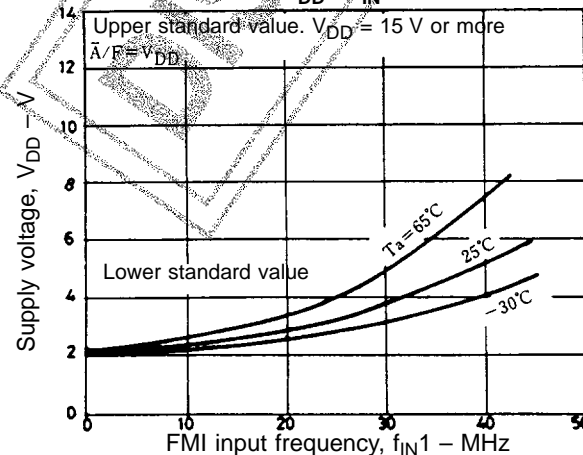
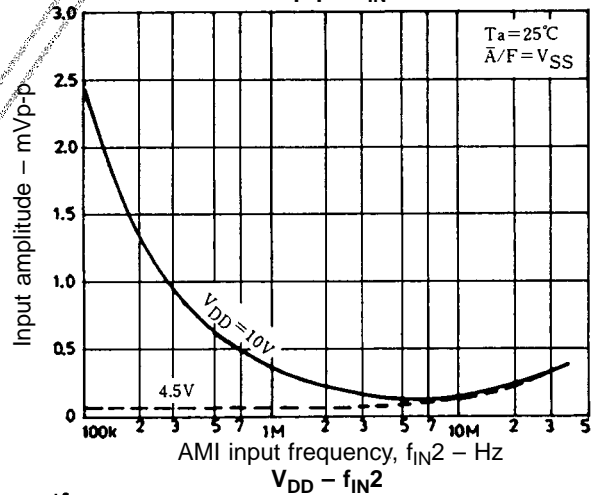
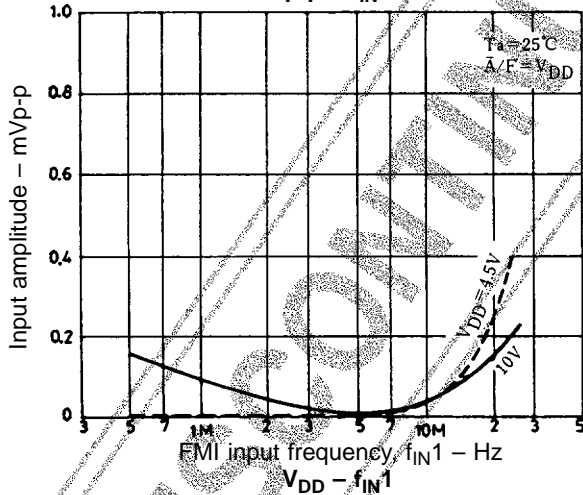
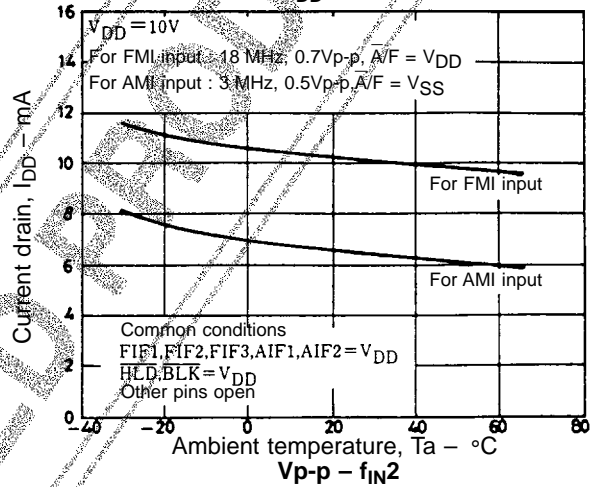
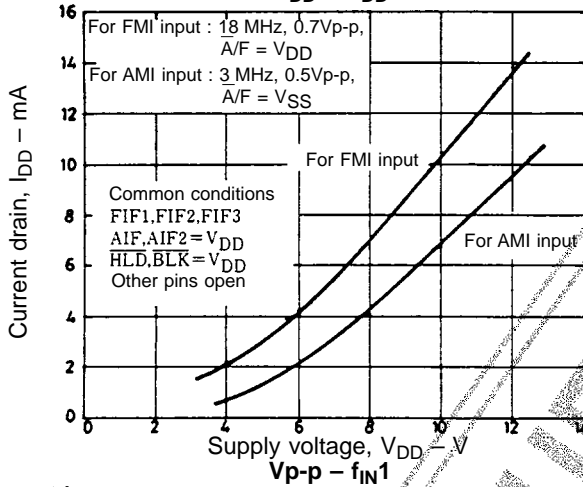
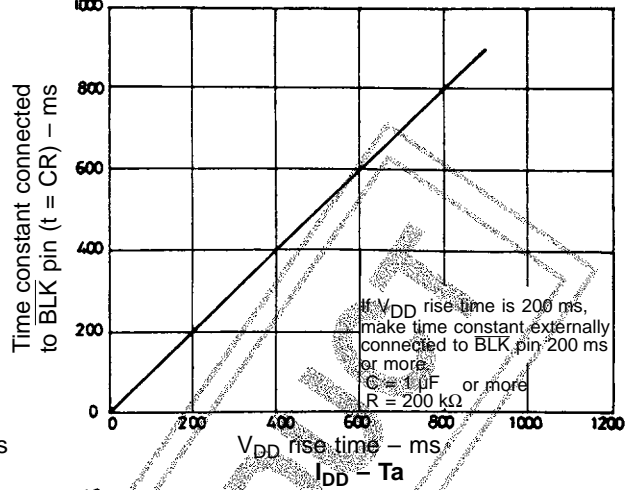
## 2-10 • 50 Hz : 50 Hz time base output pin

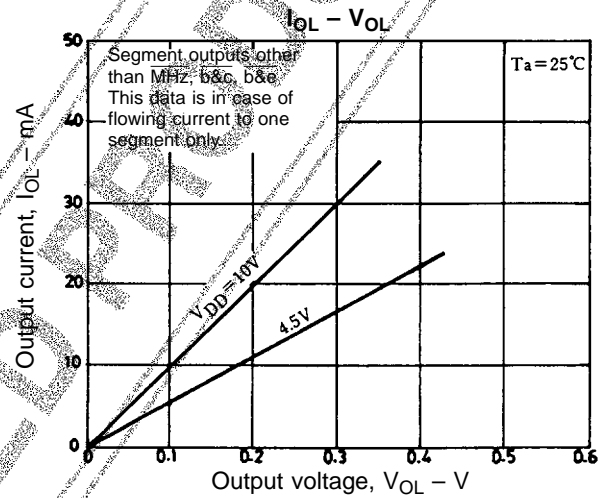
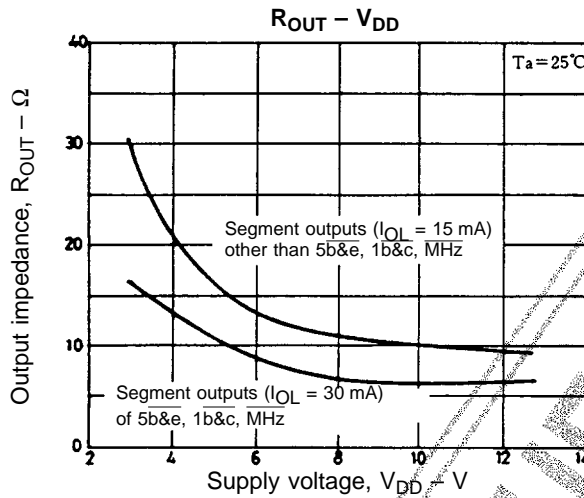
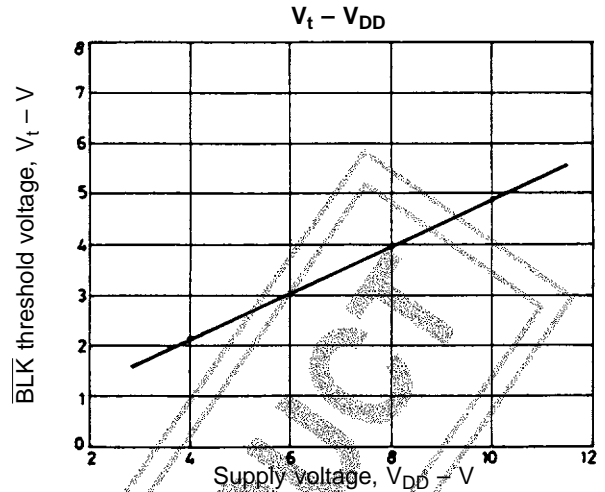
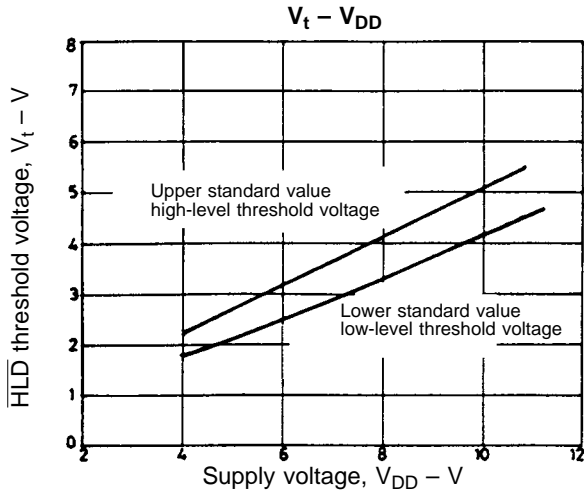


Hold time – time constant connected to HLD pin



Time constant connected to BLK pin – V<sub>DD</sub> rise time





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