LAMPIRAN

[1] Datasheet MOSFET 2sk2677

HVX-2 Series Power MOSFET — **N-Channel Enhancement type**

2SK2677
(FP10W90HVX2)

900V 10A

FEATURES

- Input capacitance (Ciss) is small. Especially, input capacitance at 0 biass is small.
- The static Rds(on) is small.
- The switching time is fast.
- Avalanche resistance guaranteed.

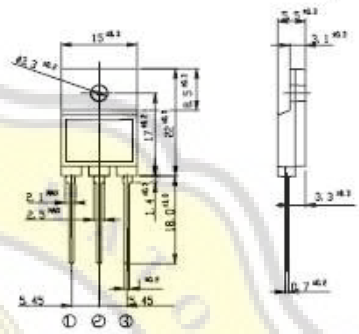
APPLICATION

- Switching power supply of AC 240V input
- High voltage power supply
- Inverter

OUTLINE DIMENSIONS

Case : ITO-3P

(Unit : mm)



①: G
②: D
③: S

RATINGS

- Absolute Maximum Ratings (Tc = 25℃)

Item	Symbol	Conditions	Ratings	Unit
Storage Temperature	T_{stg}		−55~150	℃
Channel Temperature	T_{ch}		150	
Drain-Source Voltage	V_{DSS}		900	V
Gate-Source Voltage	V_{GSS}		±30	
Continuous Drain Current (DC)	I_D		10	A
Continuous Drain Current (Peak)	I_{DP}	Pulse width≦10μs, Duty cycle≦1/100	20	
Continuous Source Current (DC)	I_S		10	
Total Power Dissipation	P_T		65	W
Repetitive Avalanche Current	I_{AR}	T_{ch} = 150℃	10	A
Single Avalanche Energy	E_{AS}	T_{ch} = 25℃	260	mJ
Repetitive Avalanche Energy	E_{AR}	T_{ch} = 25℃	26	
Dielectric Strength	V_{dis}	Terminals to case, AC 1 minute	2	kV
Mounting Torque	TOR	(Recommended torque :0.5 N·m)	0.8	N·m

[2] Datasheet IC 40106

intersil

CD40106BMS

December 1992

CMOS Hex Schmitt Triggers

Features

- High Voltage Type (20V Rating)
- Schmitt Trigger Action with No External Components
- Hysteresis Voltage (Typ.)
  - 0.9V at VDD = 5V
  - 2.3V at VDD = 10V
  - 3.5V at VDD = 15V
- Noise Immunity Greater than 50%
- No Limit on Input Rise and Fall Times
- Low VDD to VSS Current During Slow Input Ramp
- 100% Tested for Quiescent Current at 20V
- 5V, 10V and 15V Parametric Ratings
- Maximum Input Current of 1μA at 18V Over Full Package Temperature Range; 100nA at 18V and +25°C
- Standardized Symmetrical Output Characteristics
- Meets All Requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of 'B' Series CMOS Devices"

Applications

- Wave and Pulse Shapers
- High Noise Environment Systems
- Monostable Multivibrators
- Astable Multivibrators

Description

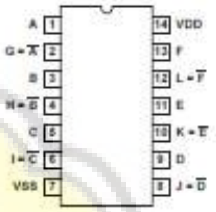
CD40106BMS consists of six Schmitt trigger circuits. Each circuit functions as an inverter with Schmitt trigger action on the input. The trigger switches at different points for positive and negative going signals. The difference between the positive going voltage (VP) and the negative going voltage (VN) is defined as hysteresis voltage (VH) (see Figure 17).

The CD40106BMS is supplied in these 14 lead outline packages:

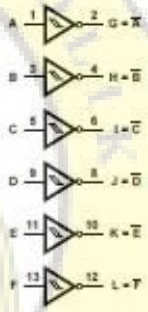
Braze Seal DIP	H4Q
Frit Seal DIP	H1B
Ceramic Flatpack	H3W

Pinout

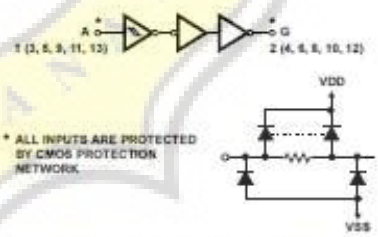
CD40106BMS
TOP VIEW



Functional Diagram



Logic Diagram



* ALL INPUTS ARE PROTECTED BY CMOS PROTECTION NETWORK

FIGURE 1. 1 OF 6 SCHMITT TRIGGERS

CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures.

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File Number 3354

[3] Datasheet IC 4050

FAIRCHILD SEMICONDUCTOR™

October 1987
Revised January 1999

CD4049UBC • CD4050BC
Hex Inverting Buffer • Hex Non-Inverting Buffer

General Description

The CD4049UBC and CD4050BC hex buffers are monolithic complementary MOS (CMOS) integrated circuits constructed with N- and P-channel enhancement mode transistors. These devices feature logic level conversion using only one supply voltage (V_{DD}). The input signal high level (V_{IH}) can exceed the V_{DD} supply voltage when these devices are used for logic level conversions. These devices are intended for use as hex buffers, CMOS to DTL/TTL converters, or as CMOS current drivers, and at V_{DD} = 5.0V, they can drive directly two DTL/TTL loads over the full operating temperature range.

Features

- Wide supply voltage range: 3.0V to 15V
- Direct drive to 2 TTL loads at 5.0V over full temperature range
- High source and sink current capability
- Special input protection permits input voltages greater than V_{DD}

Applications

- CMOS hex inverter/buffer
- CMOS to DTL/TTL hex converter
- CMOS current "sink" or "source" driver
- CMOS HIGH-to-LOW logic level converter

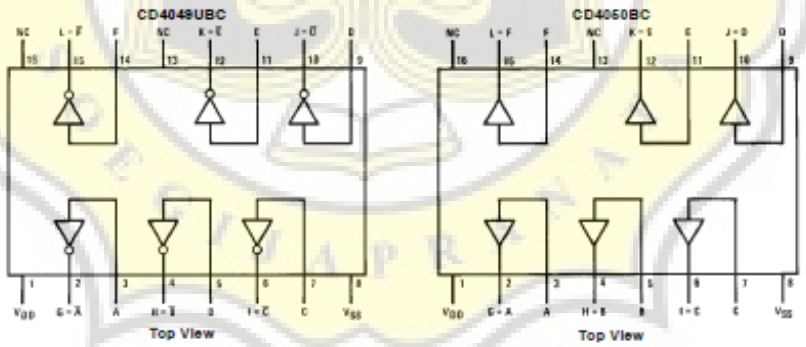
Ordering Code:

Order Number	Package Number	Package Description
CD4049UBCM	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
CD4049UBCN	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide
CD4050BCM	M16A	16-Lead Small Outline Integrated Circuit (SOIC), JEDEC MS-012, 0.150" Narrow
CD4050BCN	N16E	16-Lead Plastic Dual-In-Line Package (PDIP), JEDEC MS-001, 0.300" Wide

Devices also available in Tape and Reel. Specify by appending the suffix letter "X" to the ordering code.

Connection Diagrams

Pin Assignments for DIP



CD4049UBC • CD4050BC Hex Inverting Buffer • Hex Non-Inverting Buffer

[4] Datasheet IC 4520

TEXAS INSTRUMENTS

Data sheet acquired from Harris Semiconductor
SCHS076D – Revised March 2004

CD4518B, CD4520B Types

CMOS Dual Up-Counters

High-Voltage Types (20-Volt Rating)

CD4518B Dual BCD Up-Counter
CD4520B Dual Binary Up-Counter

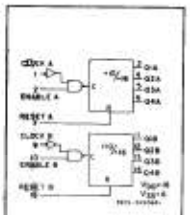
■ CD4518 Dual BCD Up-Counter and CD4520 Dual Binary Up-Counter each consist of two identical, internally synchronous 4-stage counters. The counter stages are D-type flip-flops having interchangeable CLOCK and ENABLE lines for incrementing on either the positive-going or negative-going transition. For single-unit operation the ENABLE input is maintained high and the counter advances on each positive-going transition of the CLOCK. The counters are cleared by high levels on their RESET lines.

The counter can be cascaded in the ripple mode by connecting Q4 to the enable input of the subsequent counter while the CLOCK input of the latter is held low.

The CD4518B and CD4520B types are supplied in 16-lead hermetic dual-in-line ceramic packages (F3A suffix), 16-lead dual-in-line plastic packages (E suffix), 16-lead small-outline packages (M, M96, and NSR suffixes), and 16-lead thin shrink small-outline packages (PW and PWR suffixes).

Features:

- **Medium-speed operation – 5-MHz typical clock frequency at 10 V**
- **Positive- or negative-edge triggering**
- **Synchronous internal carry propagation**
- **100% tested for quiescent current at 20 V**
- **Maximum input current of 1 μA at 18 V over full package-temperature range; 100 nA at 18 V and 25°C**
- **Noise margin (over full package-temperature range): 1 V at V_{DD} = 5 V; 2 V at V_{DD} = 10 V; 2.5 V at V_{DD} = 15 V**
- **5-V, 10-V, and 15-V parametric ratings**
- **Standardized, symmetrical output characteristics**
- **Meets all requirements of JEDEC Tentative Standard No. 13B, "Standard Specifications for Description of 'B' Series CMOS Devices"**



CD4518B, CD4520B
FUNCTIONAL DIAGRAM

Applications:

- **Multistage synchronous counting**
- **Multistage ripple counting**
- **Frequency dividers**

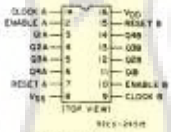
TRUTH TABLE

CLOCK	ENABLE	RESET	ACTION
↑	1	0	Increment Counter
0	↓	0	Increment Counter
↓	X	0	No Change
X	↑	0	No Change
↑	0	0	No Change
1	↓	0	No Change
X	X	1	Q1 thru Q4 = 0

X = Don't Care 1 = High State 0 = Low State

MAXIMUM RATINGS, Absolute-Maximum Values:

DC SUPPLY-VOLTAGE RANGE, (V_{DD})
Voltages referenced to V_{SS} Terminal) ..... −0.5V to +20V
INPUT VOLTAGE RANGE, ALL INPUTS ..... −0.5V to V_{DD} +0.5V
DC INPUT CURRENT, ANY ONE INPUT ..... ±10mA
POWER DISSIPATION PER PACKAGE (P_D):
For T_A = −55°C to +100°C 500mW
For T_A = +100°C to +125°C ..... Derate Linearly at 12mW/°C to 200mW
DEVICE DISSIPATION PER OUTPUT TRANSISTOR
FOR T_A = FULL PACKAGE-TEMPERATURE RANGE (All Package Types) 100mW
OPERATING-TEMPERATURE RANGE (T_A) ..... −55°C to +125°C
STORAGE TEMPERATURE RANGE (T_{stg}) ..... −65°C to +150°C
LEAD TEMPERATURE (DURING SOLDERING):
At distance 1/16 ± 1/32 inch (1.58 ± 0.79mm) from case for 10s max ..... +265°C



CD4518B, CD4520B
TERMINAL ASSIGNMENT

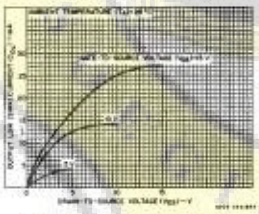


Fig. 1 – Typical output low (sink) current characteristics.

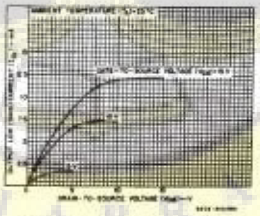


Fig. 2 – Minimum output low (sink) current characteristics.

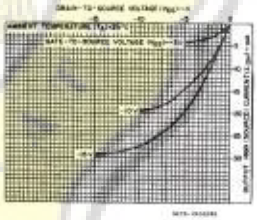


Fig. 3 – Typical output high (source) current characteristics.

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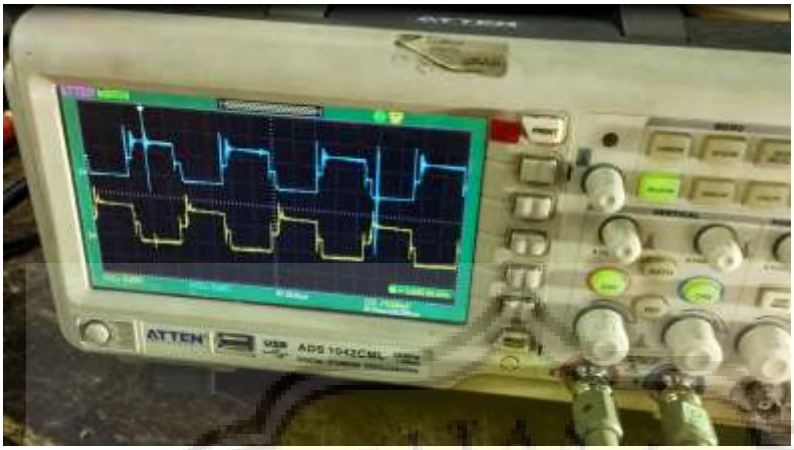
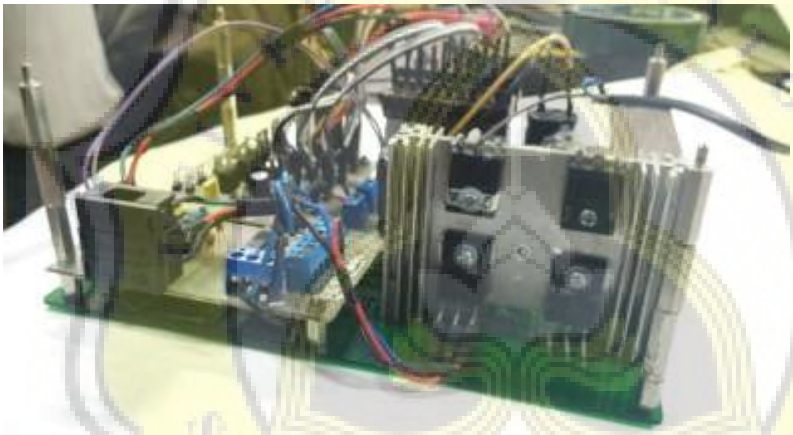
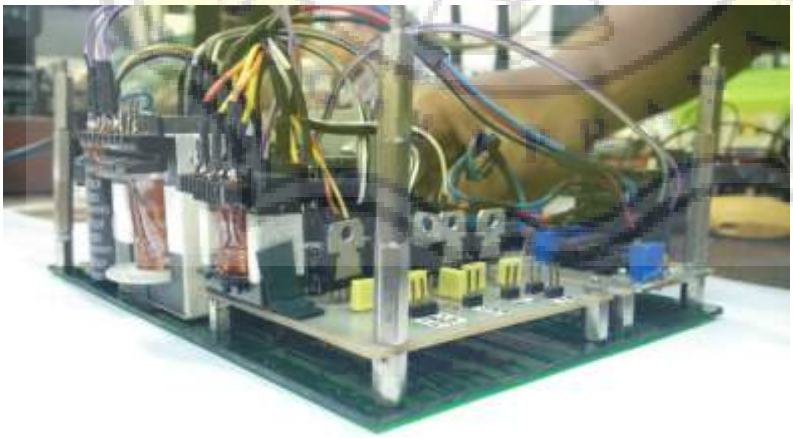
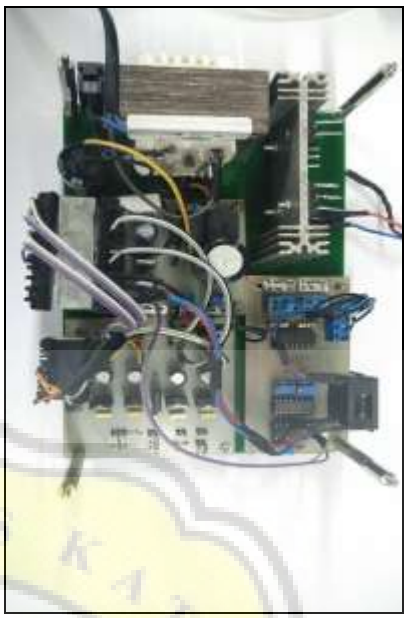
[5] Data Pengujian

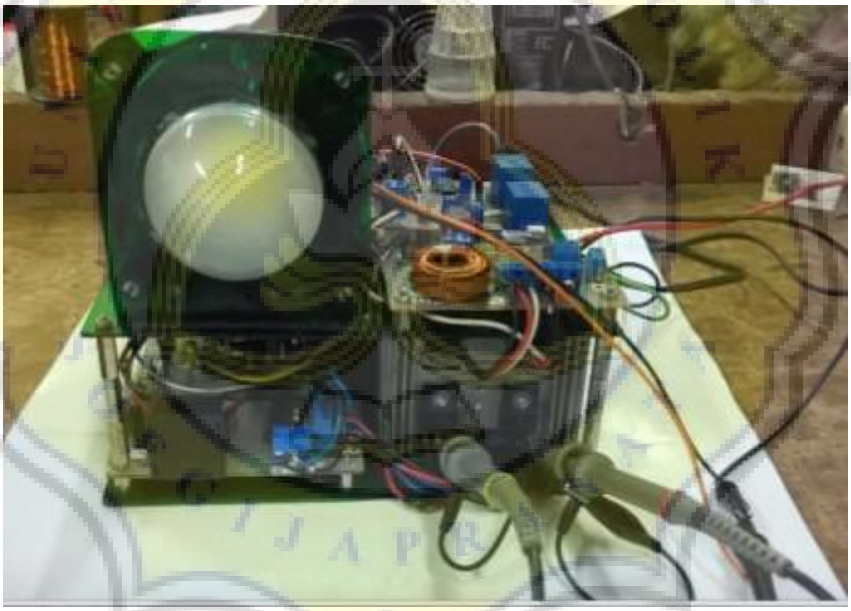






0.982
29.28





[6] Lembar Proceeding Seminar MEETAS

Modern Electrical Engineering Technology and Its Application Seminar (MEETAS) 2016

Desain Switch Mode Power supply Jenis Push Pull Converter Sebagai Catu Kontroler

Stefanus Rizal Hidayat[1)]
Prog.Di Teknik Elektro-Fakultas Teknik
Universitas Katolik Soegijapranata
Jl.pawiyatan luhur IV/1 Bendan
Dhuwur,Semarang,Indonesia
stefanusrizalh@gmail.com

Slamet Riyadi[2)]
Prog.Di Teknik Elektro-Fakultas Teknik
Universitas Katolik Soegijapranata
Jl.pawiyatan luhur IV/1 Bendan
Dhuwur,Semarang,Indonesia
Sriyadi7167@gmail.com

Abstrak— Sumber tegangan listrik merupakan salah satu kebutuhan utama di masa sekarang dan juga kebutuhan catu daya dengan *output* jamak sangat mendesak, khususnya untuk kontroler. Penggunaan trafo ferit pada catu daya jenis *switching* memberi solusi karena ukuran relatif kecil, dan catu daya *switching* dapat bekerja pada frekuensi tinggi. Salah satu catu daya *switching* yang efisien adalah jenis *push pull converter*. Pada makalah ini dirancang catu daya tersebut dengan keluaran jamak, penggunaan MOSFET yang dioperasikan pada frekuensi tinggi mampu memperkecil ukuran secara fisik. Hasil eksperimental dilampirkan untuk mendukung analisis.

Katakunci—*switching*; kontroler; *push pull converter*; MOSFET;

I. PENDAHULUAN

Pada era globalisasi ini perkembangan teknologi di dunia semakin berkembang secara pesat khususnya dalam bidang elekektronik sebab dalam perkembangannya dibutuhkan hasil yang lebih efisien. Seperti contoh pada sebuah perangkat catu daya karena kebutuhan catu daya dengan *output* jamak semakin mendesak. Catu daya merupakan suatu rangkaian alat yang berfungsi sebagai penyedia sumber energi agar dapat digunakan untuk menghidupkan semua peralatan elektronik [1].

Terdapat dua jenis catu daya yaitu catu daya linier dan catu daya *switching*. Catu daya linier lebih sering digunakan karena rancangan yang mudah dengan menggunakan tegangan AC 220V dan hanya dapat bekerja pada frekuensi rendah 50Hz [1], berbeda dengan catu daya *switching* yang dapat bekerja pada frekuensi yang tinggi dengan bentuk transformator yang kecil karena jumlah lilitan lebih sedikit.

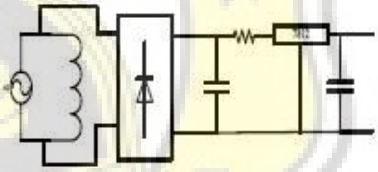
Sehingga pada pengoperasian implementasi alat ini membutuhkan sebuah catu daya dengan keluaran jamak sebagai catu kontroler. Sehingga catu daya *switching* digunakan untuk diimplementasikan agar dapat menghasilkan keluaran jamak dengan menggunakan lilitan transformator yang lebih sedikit pada trafo ferit.

II. METODE PENELITIAN

A. *Power supply*

Power supply merupakan suatu rangkaian alat yang berfungsi sebagai penyedia sumber energi listrik agar dapat digunakan untuk menghidupkan semua peralatan elektronik.

Power supply dibagi dalam dua jenis yaitu *power supply* linier dan *switching power supply*. *Power supply* linier pada umumya sering digunakan karena rancangan yang mudah tetapi hanya dapat bekerja pada frekuensi yang rendah. *Power supply* ini merubah tegangan AC 220V menjadi tegangan yang lebih kecil atau lebih besar keluarannya sesuai dengan apa yang diinginkan dengan menggunakan transformator [1]. Dan hasil keluaran dari transformator kemudian diserahkan dengan menggunakan penyearah dioda dan menggunakan regulator 78xx untuk menstabilkan tegangan sesuai pada Gbr. 1.



Gbr. 1. Rangkaian *power supply* linier dan penyearah dioda tegangan AC menjadi tegangan DC (*Rectifier*).

B. *Switch Mode Power supply*

Switching power supply menggunakan metode yang berbeda dengan *power supply* linier karena terjadinya perubahan bentuk gelombang yang tidak linier pada sisi primer dan sisi sekunder yang merupakan hasil dari pensaklaran (*switching*) [2]. Pensaklaran (*switching*) yang digunakan dalam *switching power supply* dilakukan dengan menggunakan saklar elektronik dapat berupa (BJT, MOSFET, IGBT dll)[3].

[7] **Sertifikat Seminar MEETAS**

UNIVERSITAS KRISTEN MARANATHA

OMRON

Sertifikat

diberikan kepada

STEFANUS RIZAL HIDAYAT

atas partisipasinya sebagai

PEMAKALAH

dalam acara

MEETAS

MODERN ELECTRICAL ENGINEERING TECHNOLOGY AND ITS APPLICATION SEMINAR

BANDUNG, 28 OKTOBER 2016

Novie Theresia Br. Pasaribu, S.T., M.T.
Ketua Program Studi S-1 Teknik Elektro

MEETAS

Dr. Ir. Roy Pramono Adhie, M.T.
Ketua Pelaksana