

endrichnews

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Our Product of the Month Drivers for High Power LEDs



State-of-the-art LED drivers for indoor applications

Design and production in Europe

ENEC approval and 5 years warranty

Power bandwidth: from 5W to 100W

Enhanced output voltage level over 40V in all wattage groups

Lowest inrush current available on the market

Lumotech[®]
the art of transforming

High-End LED Drivers for Indoor Applications

METAL HYBRID PPTC DEVICES WITH THERMAL ACTIVATION – MHP-TA



L: 10.9 ~ 11.4 mm
W: 3.85 mm max.
H: 1.15 mm typ.

KEY FEATURES

- » 9 V_{DC} rating
- » Two levels of current carrying capacity:
 - low current (approximately 6 A hold current @25°C)
 - high current (approximately 15 A hold current @25°C)
- » Multiple activation temperature ratings (72°C, 77°C, 82°C, 85°C, 90°C)
- » Miniature size allows for compact battery pack designs

BENEFITS

- » Capable of handling the higher voltages and battery discharge rates found in high-capacity LiP and prismatic cell applications
- » Provides resettable overtemperature protection in high-capacity LiP and prismatic cell applications

TE Connectivity provides a new MHP (Metal Hybrid PPTC) device. The rapidly expanding market for ultra-thin portable electronic devices such as media tablets and ultra-thin PCs has created demand for very thin, low-profile, light-weight and high-capacity Lithium Polymer (LiP) and prismatic cells.

The **MHP-TA**, offers a 9 V_{DC} rating and a higher current rating than typical battery strap devices to meet the battery safety requirements of higher-capacity LiP and prismatic batteries found in the latest tablet and ultra-thin computing products. Hybrid MHP technology connects a bimetal protector in parallel with a PPTC (polymeric positive temperature coefficient) device). The resulting MHP-TA device helps provide resettable overtemperature protection, while utilizing the PPTC device to act as a heater and to help keep the bimetal latched until the fault is removed.

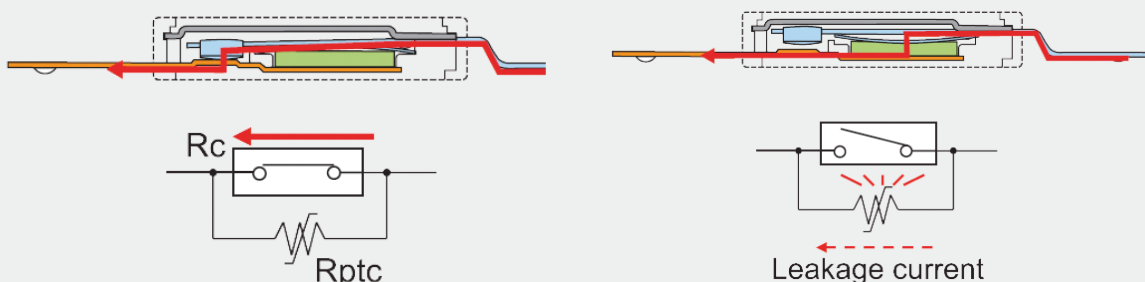
APPLICATIONS

- Battery cell protection for high-capacity Lithium Polymer and prismatic cells used in:
- » Media tablets
 - » Ultra-thin notebook PCs
 - » E-readers

DESIGN CONCEPT

In normal operation, current passes through the bimetal contact due to its low contact resistance. During an abnormal event, the device reacts to the rise in cell temperature causing the bimetal contact to open at the specified temperature and its contact resistance to increase.

At this point, the current shunts to the lower resistance PPTC which acts as a heater and helps keep the bimetal protector open and in a latched position until the fault is removed.



METAL HYBRID PPTC DEVICES WITH THERMAL ACTIVATION – MHP-TA

LOW CURRENT TYPE

TYPICAL ELECTRICAL RATING (25°C)

- » Contact rating: DC 9 V/12 A (6000 cycles)
- » Max. breaking current: DC 5 V/40 A (100 cycles)

ELECTRICAL CHARACTERISTICS (TYPICAL)

| MODEL | RATING [°C] | | OPERATION TEMPERATURE [°C] | | RESET TEMP. [°C] | | REFERENCE RESISTANCE [mΩ] | |
|--------------|-------------|------|----------------------------|-----------|------------------|------|---------------------------|--|
| | Nominal | Min. | Max. | Min. | ΔT^* | Typ. | Max. | |
| MHP-TA6-9-72 | 72 | 67 | 77 | ≥ 40 | ≥ 7 | 10 | 15 | |
| MHP-TA6-9-77 | 77 | 72 | 82 | ≥ 40 | ≥ 10 | 10 | 15 | |
| MHP-TA6-9-82 | 82 | 77 | 87 | ≥ 40 | ≥ 10 | 10 | 15 | |
| MHP-TA6-9-85 | 85 | 80 | 90 | ≥ 40 | ≥ 10 | 10 | 15 | |

* ΔT is the minimum temperature differential between the actual operation temperature of the device and the reset temperature

HIGH CURRENT TYPE

TYPICAL ELECTRICAL RATING (25°C)

- » Contact rating: DC 9 V/25 A (6000 cycles)
- » Max. breaking current: DC 5 V/80 A (100 cycles)

ELECTRICAL CHARACTERISTICS (TYPICAL)

| MODEL | RATING [°C] | | OPERATION TEMP. [°C] | | RESET TEMP. [°C] | | REFERENCE RESISTANCE [mΩ] | |
|---------------|-------------|------|----------------------|-----------|------------------|------|---------------------------|--|
| | Nominal | Min. | Max. | Min. | ΔT^* | Typ. | Max. | |
| MHP-TA15-9-72 | 72 | 67 | 77 | ≥ 40 | ≥ 7 | 2.5 | 5.0 | |
| MHP-TA15-9-77 | 77 | 72 | 82 | ≥ 40 | ≥ 10 | 2.5 | 5.0 | |
| MHP-TA15-9-82 | 82 | 77 | 87 | ≥ 40 | ≥ 10 | 2.5 | 5.0 | |
| MHP-TA15-9-85 | 85 | 80 | 90 | ≥ 40 | ≥ 10 | 2.5 | 5.0 | |
| MHP-TA15-9-90 | 90 | 85 | 95 | ≥ 40 | ≥ 10 | 2.5 | 5.0 | |

* ΔT is the minimum temperature differential between the actual operation temperature of the device and the reset temperature

PRIMARY LITHIUM BATTERIES – CR SERIES (Li-MnO₂ BATTERIES)



Lithium manganese dioxide cells have a metallic lithium anode (the lightest of all the metals) and a solid manganese dioxide cathode, immersed in a non-corrosive, non-toxic organic electrolyte.

They deliver a voltage of 3V and are cylindrical, coin and soft pack in shape. EVE's original sealing technology and highly heat-resistant material extends operating temperature range remarkably, making the batteries supremely suitable for automobile applications ---- for powering TPMS (Tire Pressure Monitoring System) sensors.

KEY FEATURES

» High Cell Voltage

The battery has an open-circuit voltage of 3.15 ... 3.30V and an operating voltage of above 3.00V, which are considerably higher than in any other commercially available primary batteries.

» Wide Operating Temperature Range

The battery is capable of operation in a wide temperature range normally from -40°C to +85°C for cylindrical type and -30°C to +70°C for button type. Particularly EVE also offers high temperature button cells for TPMS application with -40°C to +125°C.

» Flexible Configurations

The battery is available in a wide range of solder contact configurations, wire connector or in combination with battery holder.

» Excellent Storage Characteristics

The self-discharge of Li/MnO₂ battery is extremely low (less than 1% per year at 20°C), which can support up to 10 years storage with minimum deterioration.

» Superior Safety

The complete line of products is recognized and regularly supervised by Underwriters Laboratories, and meet UN transportation test requirements. No need for expensive safety electronics.

» Environmental friendly

Li/MnO₂ batteries contain no polluting metals, such as cadmium, lead, mercury, etc., or the contents of the polluting metals are within the international standards.

APPLICATIONS

- » Motherboard
- » Remote control
- » Hazardous gas sensor
- » Electronic access control systems
- » Fire alarm electronic products
- » High-end electronic toys
- » Digital cameras
- » Utility meter
- » Medical equipment
- » Logistics identification and tracking systems
- » ETC
- » Electronic tags
- » Test meters

PRIMARY LITHIUM BATTERIES – CR SERIES (Li-MnO₂ BATTERIES)

SPECIFICATIONS

| | PART NUMBER | STANDARD VOLTAGE [V] | CAPACITY [mAh] | MAX. CONT. DISCHARGE CURRENT [mA] | MAX. PULSE DISCHARGE CURRENT [mA] | TEMPERATURE [°C] | DIMENSIONS [mm] |
|----------------------------|------------------|----------------------|----------------|-----------------------------------|-----------------------------------|------------------|--------------------|
| Cylindrical Cells | | | | | | | |
| | CR14250 | 3.0 | 650 | 500 | 1500 | -40 ... +85 | 14.5 × 25.0 |
| | CR14335 | 3.0 | 800 | 1000 | 2000 | -40 ... +85 | 14.5 × 33.5 |
| | CR14505 | 3.0 | 1600 | 1500 | 3000 | -40 ... +85 | 14.5 × 50.5 |
| | CR2 (CR17345) | 3.0 | 850 | 1000 | 2000 | -40 ... +85 | 15.6 × 27.0 |
| | CR17250 | 3.0 | 750 | 1000 | 2000 | -40 ... +85 | 17.0 × 25.0 |
| | CR17335 | 3.0 | 1500 | 700 | 2500 | -40 ... +85 | 17.0 × 33.5 |
| | CR123A (CR17345) | 3.0 | 1500 | 1500 | 3000 | -40 ... +85 | 17.0 × 34.5 |
| | CR17450 | 3.0 | 2300 | 1500 | 3000 | -40 ... +85 | 17.0 × 45.0 |
| | CR17505 | 3.0 | 2400 | 1500 | 3000 | -40 ... +85 | 17.0 × 50.5 |
| | CR18505 | 3.0 | 2800 | 2000 | 3000 | -40 ... +85 | 18.5 × 50.5 |
| | CR26500 | 3.0 | 5000 | 2000 | 3000 | -40 ... +85 | 26.0 × 50.5 |
| | CR34615 | 3.0 | 10000 | 2000 | 3000 | -40 ... +85 | 34.0 × 61.5 |
| | 2CR5 | 6.0 | 1500 | 1500 | 3000 | -40 ... +85 | 34.0 × 17.0 × 45.0 |
| | CR-P2 | 6.0 | 1500 | 1500 | 3000 | -40 ... +85 | 35.0 × 19.5 × 36.0 |
| | CR14250SE | 3.0 | 950 | 7 | 30 | -40 ... +85 | 14.5 × 25.0 |
| | CR17335SE | 3.0 | 2000 | 10 | 100 | -40 ... +85 | 17.0 × 7.5 × 33.55 |
| Button Cells | | | | | | | |
| | CR1025 | 3.0 | 30 | 2 | 5 | -20 ... +70 | ∅ 10.0 × 2.5 |
| | CR1216 | 3.0 | 28 | 2 | 5 | -20 ... +70 | ∅ 12.5 × 1.6 |
| | CR1220 | 3.0 | 35 | 2 | 5 | -20 ... +70 | ∅ 12.5 × 2.0 |
| | CR1225 | 3.0 | 50 | 2 | 5 | -20 ... +70 | ∅ 12.5 × 2.5 |
| | CR1616 | 3.0 | 50 | 3 | 8 | -20 ... +70 | ∅ 16.0 × 1.6 |
| | CR1620 | 3.0 | 70 | 3 | 8 | -20 ... +70 | ∅ 16.0 × 2.0 |
| | CR1625 | 3.0 | 95 | 3 | 8 | -20 ... +70 | ∅ 16.0 × 2.5 |
| | CR1632 | 3.0 | 120 | 3 | 8 | -20 ... +70 | ∅ 16.0 × 3.2 |
| | CR2016 | 3.0 | 80 | 3 | 15 | -20 ... +70 | ∅ 20.0 × 1.6 |
| | CR2025 | 3.0 | 160 | 3 | 15 | -20 ... +70 | ∅ 20.0 × 2.5 |
| | CR2032 | 3.0 | 225 | 3 | 15 | -20 ... +70 | ∅ 20.0 × 3.2 |
| | CR2320 | 3.0 | 150 | 6 | 25 | -20 ... +70 | ∅ 23.0 × 2.0 |
| | CR2330 | 3.0 | 280 | 6 | 25 | -20 ... +70 | ∅ 23.0 × 3.0 |
| | CR2354 | 3.0 | 500 | 6 | 25 | -20 ... +70 | ∅ 23.0 × 5.4 |
| | CR2430 | 3.0 | 280 | 6 | 25 | -20 ... +70 | ∅ 24.5 × 3.0 |
| | CR2450 | 3.0 | 600 | 6 | 25 | -20 ... +70 | ∅ 24.5 × 5.0 |
| | CR2477 | 3.0 | 1000 | 6 | 25 | -20 ... +70 | ∅ 24.5 × 7.7 |
| | CR3032 | 3.0 | 500 | 6 | 25 | -20 ... +70 | ∅ 30.0 × 3.2 |
| Button Cell for LED | | | | | | | |
| | CR2032SL | 3.0 | 500000(cycles) | 15mA/1.8s (1 cycle) | 15 | -20 ... +70 | ∅ 20.0 × 3.2 |
| 9 V Cell | | | | | | | |
| | CR2032SL | 9.0 | 1200 | 120 | 400 | -40 ... +85 | 26.2 × 17.2 × 49.2 |
| Soft Pack Cells | | | | | | | |
| | CF284646 | 3.0 | 800 | | | -20 ... +60 | 2.9 × 46.0 × 46.0 |
| | CF502445 | 3.0 | 1100 | | | -20 ... +60 | 5.2 × 25.0 × 45.0 |
| | CF652230 | 3.0 | 800 | 300 | 500 | -20 ... +60 | 6.7 × 23.0 × 31.0 |

SHIELDED SMD POWER INDUCTORS – UPGRADE

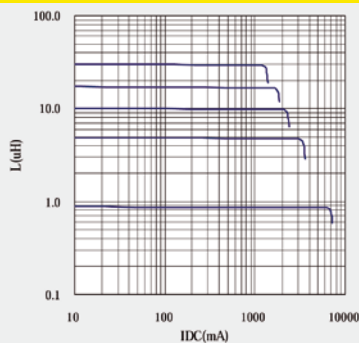
FEATURES

- » Mn-Zn core
- » High saturation current
- » Low DCR
- » Top down construction (lead wire is guided to solder joint from top of core)
- » Tighter tolerance (20 % from 10 μ H)
- » Operating temperature: -40 °C ... +125 °C

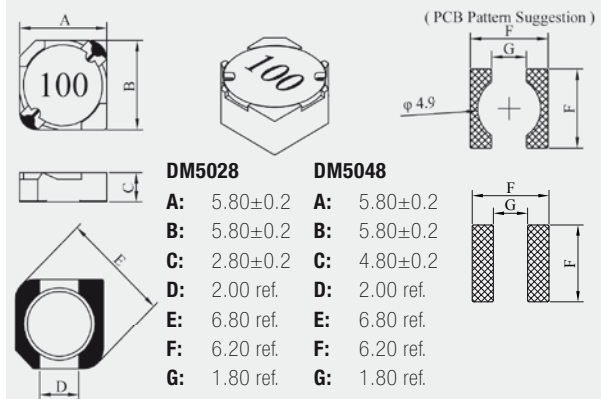


The new **DM5028/DM5048 shielded SMD** power inductor series are developed specially for use as choke in DC/DC converters. For lower DCR and higher saturation current the core material MnZn was selected. The top down constructions features tight tolerance and best solderability.

SATURATION CURRENT DM5028 SERIES



DIMENSIONS (mm)



| PART NUMBER | INDUCTANCE [μ H] | RDC, typ. [$m\Omega$] | RDC, max. [$m\Omega$] | I _{sat} [A], typ. | I _{rms} [A], typ. |
|-------------------|-----------------------|-------------------------|-------------------------|----------------------------|----------------------------|
| DM5028-1R0YLB-DE2 | 1.0 ± 30 % | 13 | 18 | 6.50 | 5.80 |
| DM5028-2R7YLB-DE2 | 2.7 ± 30 % | 20 | 27 | 4.00 | 4.30 |
| DM5028-4R2YLB-DE2 | 4.2 ± 30 % | 26 | 35 | 3.70 | 3.70 |
| DM5028-5R3YLB-DE2 | 5.3 ± 30 % | 29 | 40 | 3.50 | 3.50 |
| DM5028-6R2YLB-DE2 | 6.2 ± 30 % | 36 | 47 | 3.00 | 3.10 |
| DM5028-8R2YLB-DE2 | 8.2 ± 30 % | 46 | 60 | 2.50 | 2.70 |
| DM5028-100MLB-DE2 | 10.0 ± 20 % | 53 | 67 | 2.30 | 2.50 |
| DM5028-120MLB-DE2 | 12.0 ± 20 % | 57 | 72 | 2.00 | 2.35 |
| DM5028-150MLB-DE2 | 15.0 ± 20 % | 69 | 87 | 1.80 | 2.20 |
| DM5028-180MLB-DE2 | 18.0 ± 20 % | 84 | 105 | 1.60 | 1.95 |
| DM5028-220MLB-DE2 | 22.0 ± 20 % | 110 | 132 | 1.50 | 1.65 |
| DM5028-270MLB-DE2 | 27.0 ± 20 % | 134 | 160 | 1.30 | 1.50 |
| DM5028-330MLB-DE2 | 33.0 ± 20 % | 163 | 195 | 1.20 | 1.35 |
| DM5048-2R2YLB-DE2 | 2.2 ± 30 % | 17 | 22 | 5.00 | 4.50 |
| DM5048-3R3YLB-DE2 | 3.3 ± 30 % | 23 | 30 | 4.00 | 4.10 |
| DM5048-4R7YLB-DE2 | 4.7 ± 30 % | 28 | 33 | 3.50 | 3.80 |
| DM5048-6R8YLB-DE2 | 6.8 ± 30 % | 30 | 40 | 3.20 | 3.50 |
| DM5048-8R2YLB-DE2 | 8.2 ± 30 % | 35 | 46 | 2.90 | 3.20 |
| DM5048-100MLB-DE2 | 10.0 ± 20 % | 40 | 52 | 2.60 | 2.80 |
| DM5048-150MLB-DE2 | 15.0 ± 20 % | 55 | 72 | 2.10 | 2.30 |
| DM5048-220MLB-DE2 | 22.0 ± 20 % | 75 | 98 | 1.75 | 2.00 |
| DM5048-270MLB-DE2 | 27.0 ± 20 % | 95 | 125 | 1.60 | 1.80 |
| DM5048-330MLB-DE2 | 33.0 ± 20 % | 116 | 150 | 1.40 | 1.70 |
| DM5048-390MLB-DE2 | 39.0 ± 20 % | 122 | 160 | 1.30 | 1.60 |
| DM5048-470MLB-DE2 | 47.0 ± 20 % | 155 | 200 | 1.20 | 1.45 |
| DM5048-560MLB-DE2 | 56.0 ± 20 % | 165 | 216 | 1.10 | 1.35 |
| DM5048-680MLB-DE2 | 68.0 ± 20 % | 220 | 290 | 1.00 | 1.20 |
| DM5048-820MLB-DE2 | 82.0 ± 20 % | 250 | 325 | 0.90 | 1.10 |
| DM5048-101MLB-DE2 | 100.0 ± 20 % | 275 | 360 | 0.80 | 1.00 |

DRIVERS FOR HIGH POWER LED/INDOOR



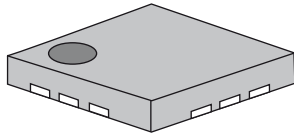
With our leading manufacturer Lumotech we have the best concerted drivers for all our LEDs, suitable for the most diverse indoor applications. Whether 5 Watt driver or 100 Watt driver with adjustable output current between 350 mA and 2800 mA or drivers with 2-channel output, ideal for spot lights using 2 LEDs, or low-cost versions for cost-sensitive applications, which only require one fixed constant current output without dimming—we have the suitable driver for you. More information and data sheets can be found at: http://www.endrich.com/de/182084/indoor?prodnave=6_181441_182084

Advantages of the indoor drivers

- » 5 years warranty
- » ENEC approval
- » Design and manufacturing in Europe
- » Only use of traceable components from Europe, Japan and USA
- » All wattage groups also with enhanced output voltage level of more than 40 Volts
- » Dimming level down to 1% at the 20 Watt drivers
- » Lowest inrush current available on the market
- » Ripple current below 10%
- » EMC-optimized, testing also conducted in installed state with metal housing
- » Customized solutions possible
- » No switch-off when reaching the maximum temperature, but current reduction

| PART NUMBER | POWER | OUTPUT VOLTAGE RANGE | CURRENT RANGE | CONSTANT VOLTAGE MODE | INPUT VOLTAGE | DIMMABLE |
|--------------|-------|---------------------------|-----------------------------|--------------------------|-----------------------------|-------------------------|
| L05050 | 6.5 W | 2 ... 12 V _{DC} | 700 mA | | 110 ... 240 V _{AC} | no |
| L05150 | 5.5 W | 2 ... 17 V _{DC} | 350 mA | | 110 ... 240 V _{AC} | no |
| L05020 | 12 W | 2 ... 32 V _{DC} | 350/700 mA | | 110 ... 240 V _{AC} | no |
| L05020-500 | 12 W | 2 ... 24 V _{DC} | 500/700 mA | | 110 ... 240 V _{AC} | no |
| L05020-40250 | 12 W | 2 ... 43 V _{DC} | 200/250 mA | | 110 ... 240 V _{AC} | no |
| L05020-390 | 12 W | 2 ... 32 V _{DC} | 270/390 mA | | 110 ... 240 V _{AC} | no |
| L05020-40300 | 12 W | 2 ... 43 V _{DC} | 180/300 mA | | 110 ... 240 V _{AC} | no |
| L05021 | 12 W | 2 ... 32 V _{DC} | 350/700 mA | | 220 ... 240 V _{AC} | Mains, trailing edge |
| L05021-40250 | 12 W | 2 ... 40 V _{DC} | 200/250 mA | | 220 ... 240 V _{AC} | Mains, trailing edge |
| L05021-40300 | 12 W | 2 ... 40 V _{DC} | 180/300 mA | | 220 ... 240 V _{AC} | Mains, trailing edge |
| L05011i | 20 W | 2 ... 33 V _{DC} | 350/700/1050 mA | 10/12/24 V _{DC} | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05011i2 | 20 W | 6 ... 42 V _{DC} | 150 ... 1200 mA | 6 ... 42 V _{DC} | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05012 | 20 W | 2 ... 33 V _{DC} | 350 ... 1400 mA | | 110 ... 240 V _{AC} | no |
| L05013 | 20 W | 2 ... 33 V _{DC} | 700 mA | | 110 ... 240 V _{AC} | no |
| L05013-350 | 12 W | 2 ... 33 V _{DC} | 350 mA | | 110 ... 240 V _{AC} | no |
| L05013-40500 | 20 W | 3 ... 40 V _{DC} | 500 mA | | 110 ... 240 V _{AC} | no |
| L05013-1050 | 20 W | 2 ... 24 V _{DC} | 1050 mA | | 110 ... 240 V _{AC} | no |
| L05013-1200 | 20 W | 2 ... 24 V _{DC} | 1200 mA | | 110 ... 240 V _{AC} | no |
| L05016i | 20 W | 2 ... 33 V _{DC} | Output 1/2: je 250...500 mA | | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05016Ci | 20 W | 2 ... 43 V _{DC} | 110 ... 500 mA | | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05016CiD | 20 W | 3 ... 45 V _{DC} | Output 1/2: je 100...300 mA | | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05030 | 20 W | 2 ... 22 V _{DC} | 350/700 mA | 4 ... 24 V _{DC} | 24 ... 32 V _{AC} | no |
| L05035 | 20 W | 2 ... 30 V _{DC} | Output 1/2: je 350 mA | | 24 ... 32 V _{AC} | no |
| L05040 | 40 W | 7 ... 55 V _{DC} | 100 ... 1000 mA | | 110 ... 240 V _{AC} | DALI |
| L05044 | 40 W | 12 ... 32 V _{DC} | 300 ... 1400 mA | | 110 ... 240 V _{AC} | no |
| L05045 | 40 W | 16 ... 32 V _{DC} | 160 ... 1400 mA | | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05046 | 40 W | | 1.7 A max. | 24 V _{DC} | 110 ... 240 V _{AC} | no |
| L05049 | 40 W | 22 ... 60 V _{DC} | 245 ... 1050 mA | | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |
| L05060 | 100 W | 20 ... 60 V _{DC} | 350 ... 2800 mA | | 110 ... 240 V _{AC} | 1-10 V, potmeter, pulse |

DRIVER NJU72501 WITH MULTI-MODE CHARGE PUMP FOR PIEZO SOUNDERS



FEATURES

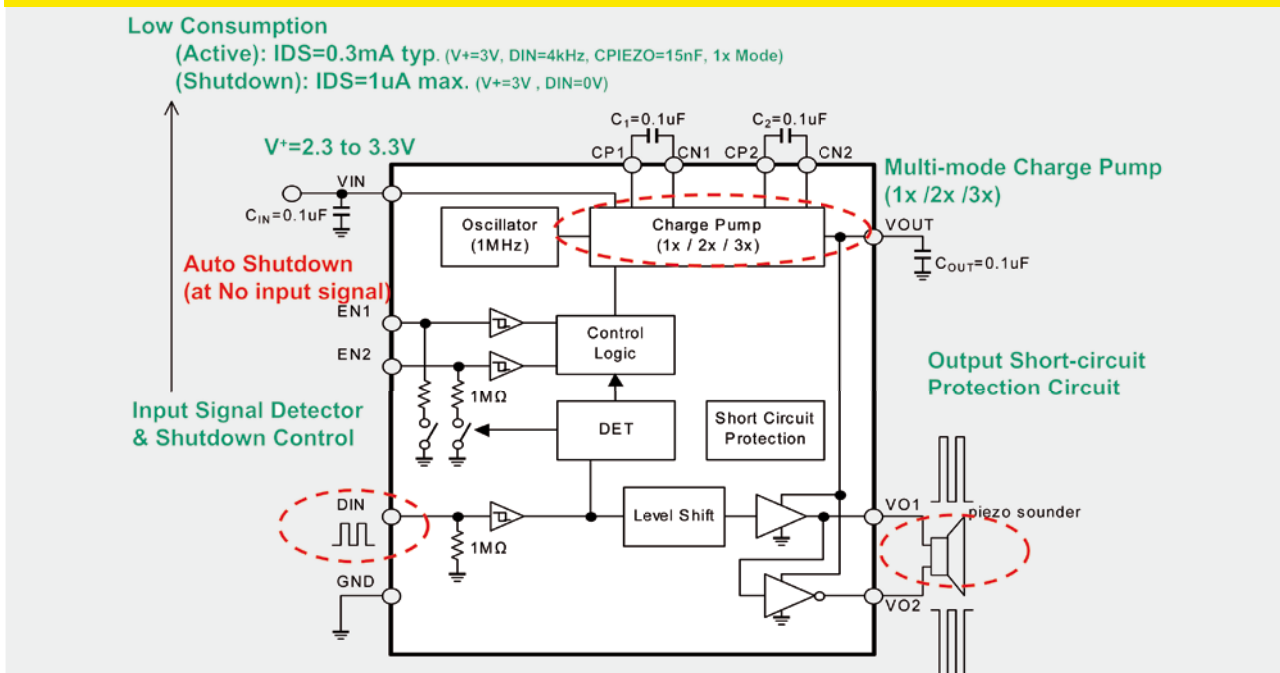
- » Operating Voltage: 2.3 to 3.4V
- » Consumption current: Active: $I_{DS}=0.3\text{ mA typ.}$ ($V+=3\text{V}$, $DIN=4\text{ kHz}$, $C_{PIEZO}=15\text{ nF}$, 1x mode)
Shutdown: $I_{DS}=1\mu\text{A max.}$ ($V+=3\text{V}$, $DIN=0\text{V}$)
- » Multi-Mode Charge Pump (1x/2x/3x)
- » Input Signal Detector & Shutdown Control
- » Output Short-circuit Protection Circuit
- » C-MOS Technology
- » Operating temperature: $-40^{\circ}\text{C} \dots +85^{\circ}\text{C}$
- » Package Outline: QFN12

The NJU72501 is a switching driver with multi mode charge pump for piezo-sounder. It can drive outputs up to 18Vpp from 3V supply. For adjusting the piezoelectric sounder sound volume, the charge pump can operate in either of a 1x, 2x or 3x mode. Because NJU72501 has the shutdown function, it is suitable for the battery application.

APPLICATIONS

- » Healthcare
- » Wrist watches
- » Alarm clocks
- » Handheld GPS devices
- » PDAs
- » applicable for all piezo transducers, for example our SMD or PIN-types of our supplier CHINASOUND: CSPT13A03/CSPT12A03/ CSPT16B03/ CPT17D12

BLOCK DIAGRAM NJU72501



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