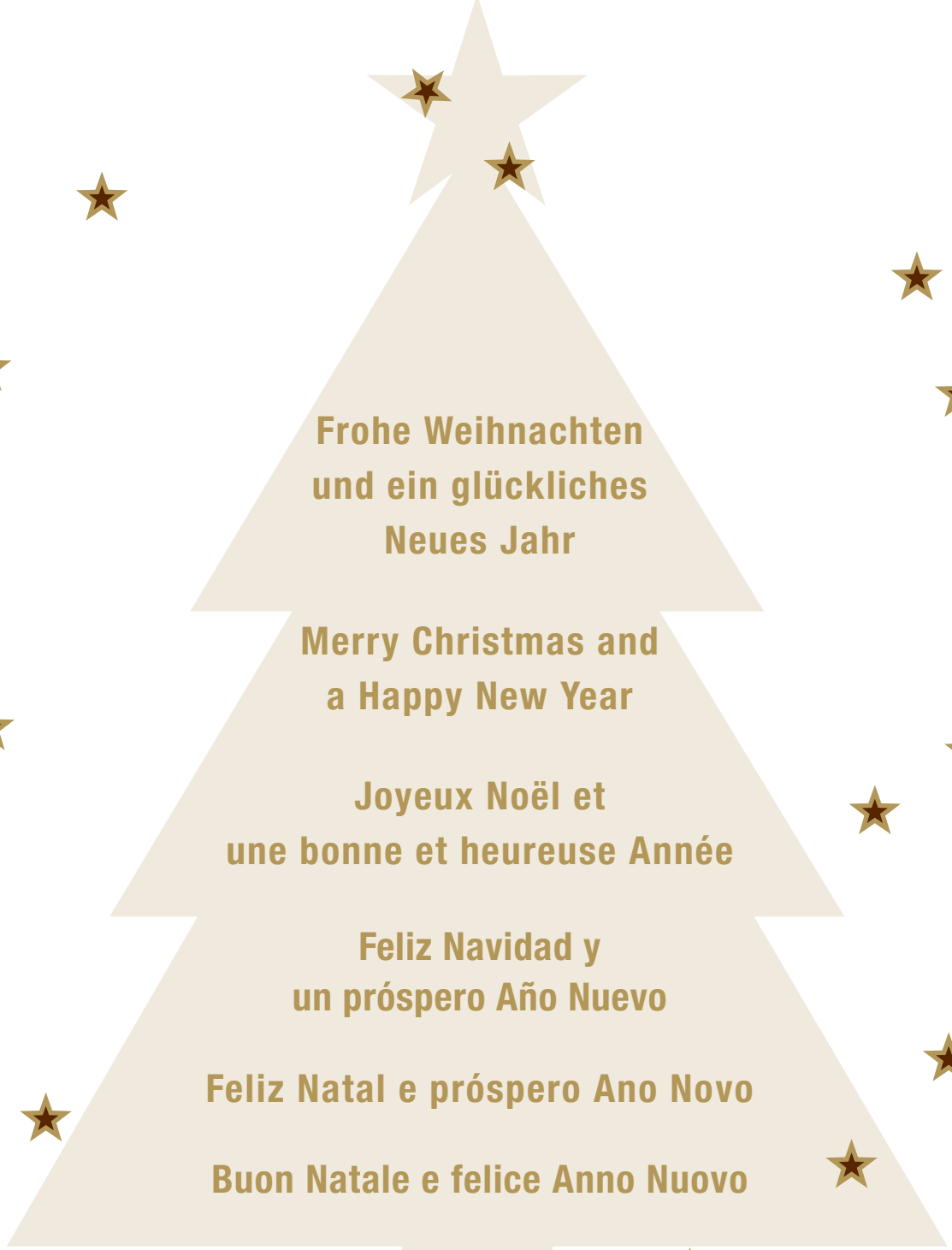


# endrich news

www.endrich.com



**Frohe Weihnachten  
und ein glückliches  
Neues Jahr**

**Merry Christmas and  
a Happy New Year**

**Joyeux Noël et  
une bonne et heureuse Année**

**Feliz Navidad y  
un próspero Año Nuevo**

**Feliz Natal e próspero Ano Novo**

**Buon Natale e felice Anno Nuovo**

**wish you and your family  
the management and staff of Endrich and Novitronic companies**

## LONG MINI-FLAT PHOTO COUPLER / CREEPAGE >8 mm



These product series **CT101x** and **CT111x** consists of a photo transistor optically coupled to a Gallium Arsenide (GaAs) Infrared-emitting diode in a 4-lead SOP Package (Non-

base bonded) and 5-lead SOP Package (Base bonded). Multiple CTR selections are available. They are packaged in double mold over under structure to have very good and stable isolation voltage with better CTR performance and low coupling capacitance. These package has better transfer ratio comparing to co-planar design. These enable low HFE photo transistor to be used to get the similar CTR and indirectly contribute for the device to have better switching speed and low dark current ( $I_{CEO}$ ) performance.

### SAFETYHOUSE REQUIREMENT FOR SWITCHING MODE POWER SUPPLY



Figure 1

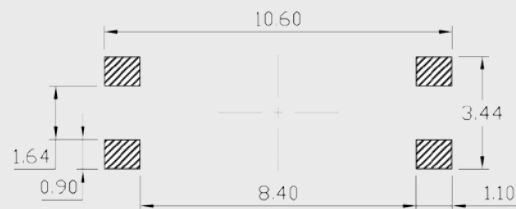


Figure 2

The requirements are stated in DIN EN 60747-5-5 (VDE0884) Class II and UL1577 (Double Protection).

In IEC 60065 for Audio Visual or the IEC 60950 for Information Technology there is one distance which is a requirement for switching power supplies which is the 8 mm spacing requirement between the hazardous input voltage (AC 240V power-line voltage) and the safety of low voltage.

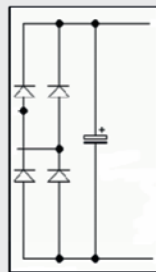
The CT101X series and CT111X series is designed to have package creepage of more than 8 mm. Figure 2 shows the solder mask design which allows 8.4 mm creepage.

### BLOCK DIAGRAM – SIMPLE FLYBACK SWITCH MODE POWER SUPPLY

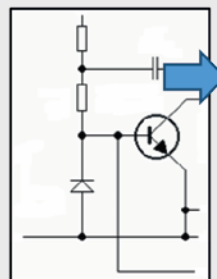
Input supply



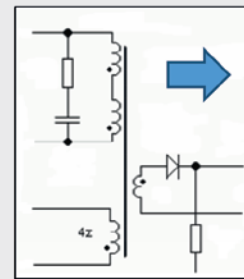
Rectifier



PWM

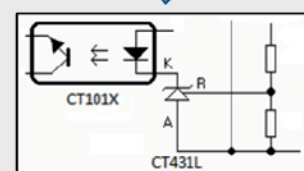
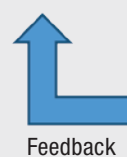


Transformer



Output supply

AC input supply is rectified using bridge rectifiers and the DC signal is feed to a PWM circuitry. A specified voltage will trigger the CT431L and this will cause the CT101X to turn ON and limits the current to the power transistor base. These process reduces the PWM duty cycle thus controls the energy delivered to the transformer. This method stabilizes the output power very effectively.

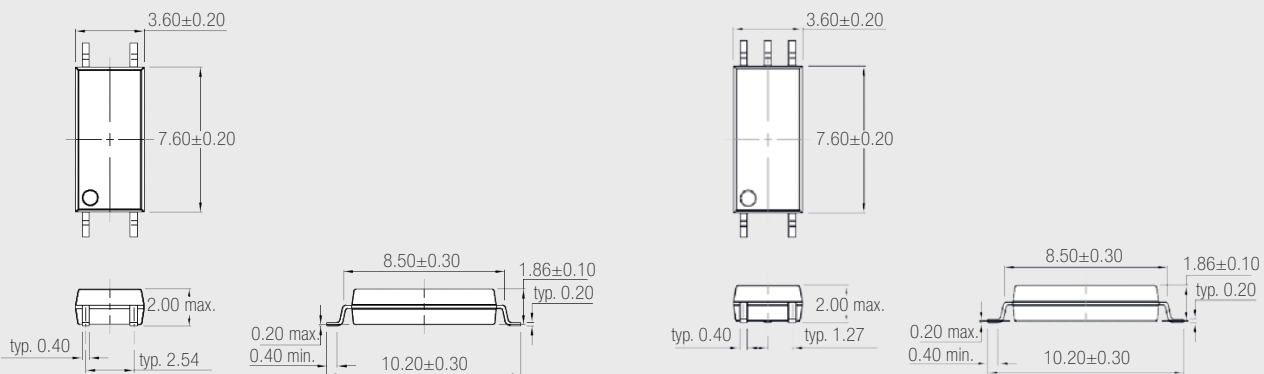


# LONG MINI-FLAT PHOTO COUPLER / CREEPAGE >8 mm

## FEATURES

- » Isolation voltage 5000V<sub>rms</sub>
- » External creepage > 8 mm
- » Low profile surface mount (SMD) in 4pin and 5pin (max. 2mm)
- » DC input with Infrared Led coupled with phototransistor
- » Multiple Current Transfer Ratio (CTR) selection
- » Dual option – with base bonded (5 pin) or without base bonded (4 pin)
- » Wide operating temperature -55°C to +110°C
- » High V<sub>(BR)CEO</sub> (former BV<sub>CEO</sub>) > 80V
- » Low forward current (I<sub>F</sub>) operation at 1 mA
- » Low dark current (I<sub>CEO</sub>); <100 nA @ 80V (25°C)
- » Low coupling capacitance
- » RoHS compliant and Halogen free
- » Low coupling capacitance
- » Moisture sensitive level (MSL): 1
- » Approvals
  - UL - UL1577 (E364000)
  - VDE - EN60747-5-5 (VDE0884-5)
  - CQC – GB4943.1, GB8898
  - IEC60065, IEC60950

## DIMENSIONS (mm)



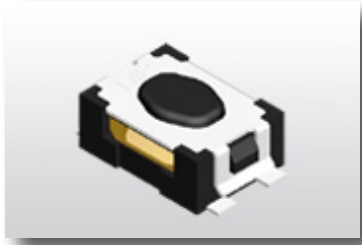
## SELECTION GUIDE – 4L Mini-Flat/Non-Base Bonded

PART NUMBER	CTR [%] 1mA @5V		CTR [%] 5mA @5V		CTR [%] 10mA @5V	
	Min.	Max.	Min.	Max.	Min.	Max.
CT1010	-	-	50	600	-	-
CT1011	-	-	-	-	60	300
CT1012	22	-	-	-	63	125
CT1013	34	-	-	-	100	200
CT1014	56	-	-	-	160	320
CT1017	-	-	80	160	-	-
CT1018	-	-	130	260	-	-
CT1019	-	-	200	400	-	-

## SELECTION GUIDE – 5L Mini-Flat/Base Bonded

PART NUMBER	CTR [%] 1mA @5V		CTR [%] 5mA @5V		CTR [%] 10mA @5V	
	Min.	Max.	Min.	Max.	Min.	Max.
CT1110	-	-	50	600	-	-
CT1111	-	-	-	-	60	300
CT1112	22	-	-	-	63	125
CT1113	34	-	-	-	100	200
CT1114	56	-	-	-	160	320
CT1116	-	-	100	300	-	-
CT1117	-	-	80	160	-	-
CT1118	-	-	130	260	-	-
CT1119	-	-	200	400	-	-

## 2.8×3.8 mm SIDE PUSH/VERTICAL PUSH TYPE TACT SWITCH/IPT SERIES



**Certificates:**  
**ISO14001 and TS19649**

Mainly used as **signal switch** of electric devices with general requirements of mechanical and electrical characteristic.

**Diptronics manufacturing Inc.** was founded in 1986 is specialized and certified in dip, tact, rotary, slide, detector, multi function and illuminated switches.

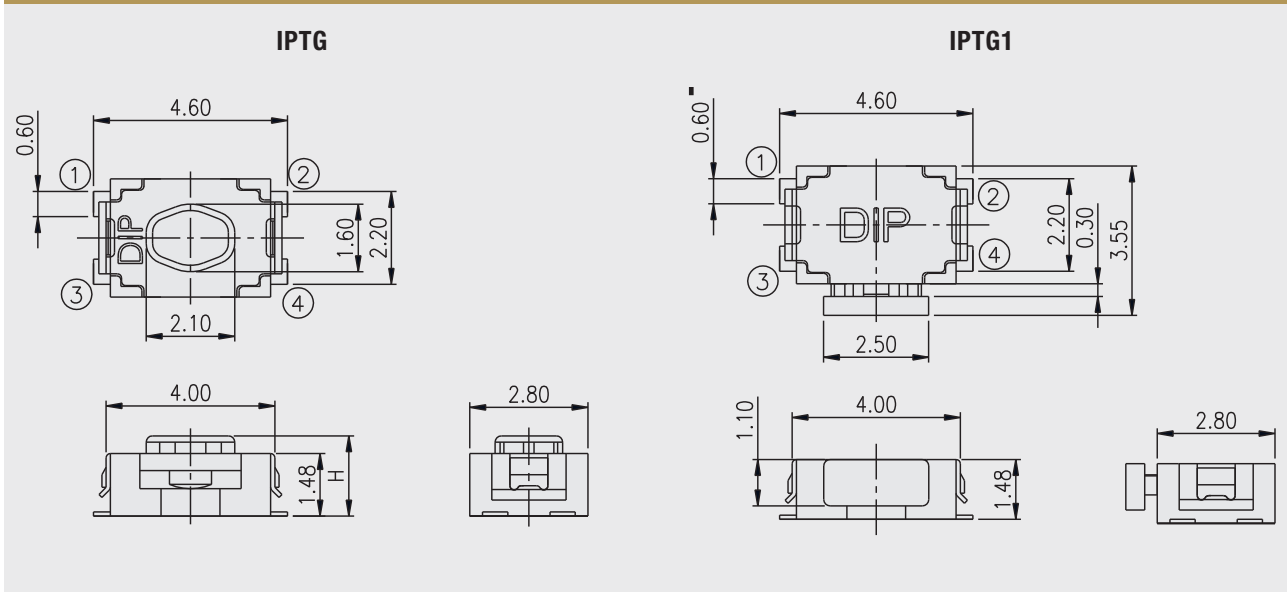
With complete in-house production, with professional R&D team, from raw-materials to finished products; including in-house press, injection, assembly and plating Diptronics offers:

- » In time delivery with superior quality!
- » LED and switch integration with in-house assembly line!
- » Continuously development in smaller, thinner and creative switches to fulfill the fast changing market demand!

### TYPICAL APPLICATIONS



### DIMENSIONS – IPT SERIES (mm)



## 2.8×3.8 mm SIDE PUSH/VERTICAL PUSH TYPE TACT SWITCH/IPT SERIES

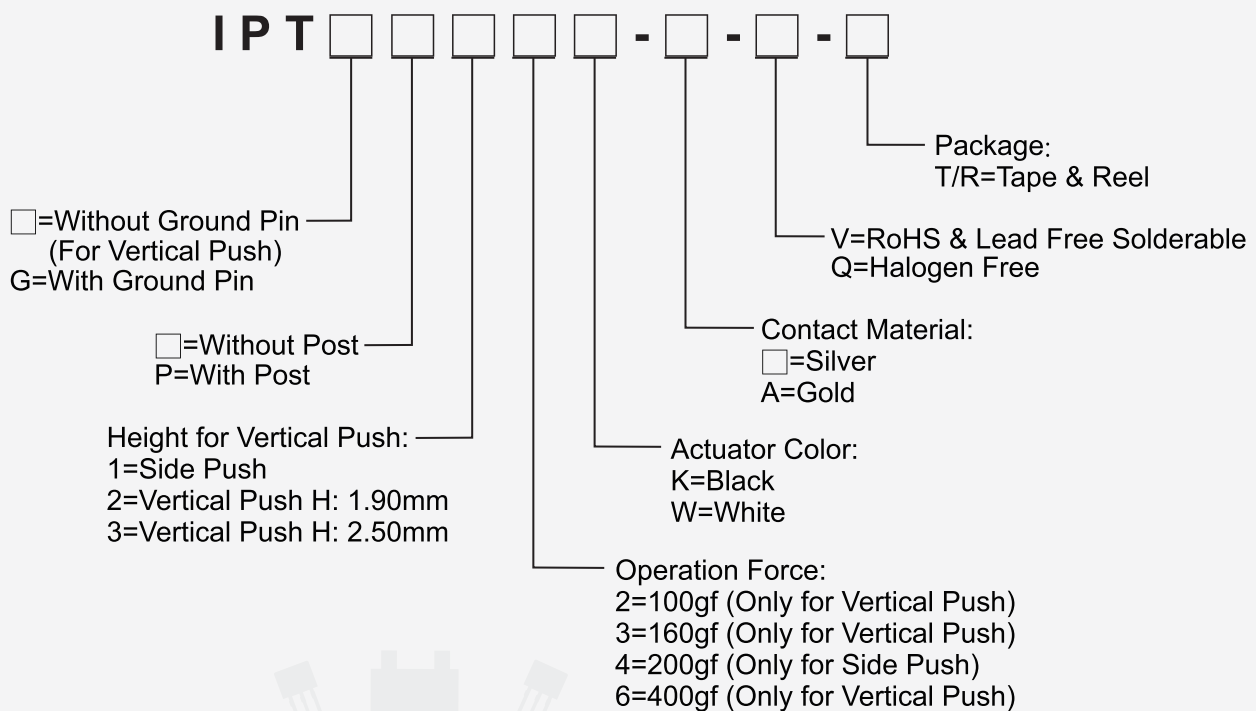
### FEATURES

- » Easy for pick and place
- » Insert molding type
- » Dust proof: IP40
- » Halogen free (Q) / RoHS & lead free solderable (V)
- » Compact size
- » Contact material: silver/gold
- » With/without ground pin
- » **Delivery time about 4 to 6 weeks**
- » Packaging: Tape & Reel
  - IPTG14: 3500 pcs.
  - IPTG23: 7000 pcs.
  - IPTG33: 6300 pcs.

### SPECIFICATIONS

- » Operating force: 400 ±50 gf (vertical push)  
200 ±65 gf (side push)  
160 ±50 gf (vertical push)
- » Stroke: 0.20±0.1 mm (side push)  
0.13±0.1 mm (vertical push)
- » Bounce time: 10 ms max
- » Electrical life: 100.000 cycles min
- » Rating: 50 mA, 12 VDC
- » Operating temperature range: -30°C to +85°C
- » Storage temperature range: -40°C to +85°C

### HOW TO ORDER



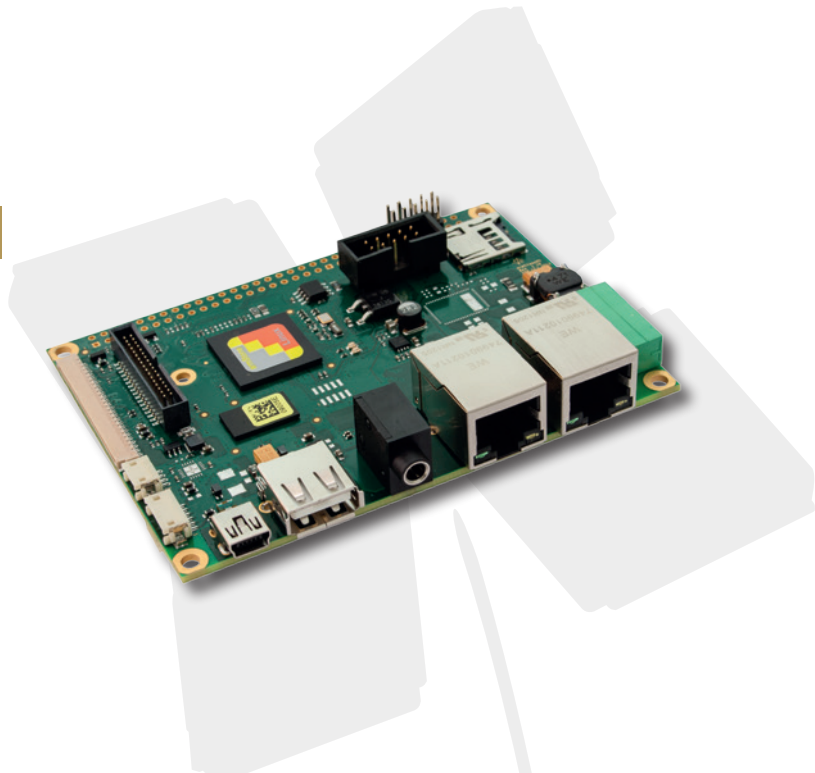
## EMBEDDED BOARDS – SBC/CoM-BOARDS

**F&S Elektronik Systeme GmbH** was established in 1990 and is specialized in Embedded Boards with WindowsCE and Linux. The boards enable to connect simple and cost-optimized displays as well as further peripheral devices via various interfaces. Several form factors (including Q7) are available for CoM-Boards and PicoITX for SBC. The boards are equipped with Freescale Cortex-A5/Cortex-A9 CPUs up to Quad-Core which are available for 10 years.

Also F&S has their own assembly production, produced with modern production facilities in Stuttgart, Germany. Furthermore, many years of experience in the Embedded Market result in innovative and up to date customer solutions, completed by an extensive soft- and hardware support.

### Short description of armStone (Single Board Computer)

- » Module size: 100 mm × 72 mm
- » Single voltage: 5 V, optional 12 V
- » LVDS, DVI
- » Feature connector 2.54 mm
- » PicoITX - SBC



### Short description of efus (Computer on Module-Board)

- » Module size: 47 mm × 62 mm
- » Single voltage: 5 V
- » RGB, LVDS, DVI
- » MXM2 Goldfinger connector, 230 Pins, 0.5 mm
- » Camera, PCIe, SATA
- » Lateral extension for radio modules (WLAN, ZigBee, Z-Wave, EnOcean) possible



# EMBEDDED BOARDS – SBC/CoM-BOARDS

PARAMETERS

armStoneA5 (SBC)

armStoneA9 (SBC)

efusA9 (CoM-Board)

## SBC/CoM-BOARDS – SPECIFICATIONS

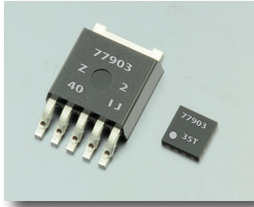
<b>Processing power</b>	++	++++	+++
<b>Windows/Linux</b>	6.0 R3, Compact 7, Compact 2013/Linux 3.3/MQX	6.0 R3, Compact 7, Compact 2013/Linux 3.3/Android	Compact 7, Compact 2013/Linux 3.3
<b>CPU</b>	Freescale Vybrid Single-/Dual-Core Cortex-A5 - 500MHz [Cortex-M4 - 167 MHz]	Freescale i.MX6 Single-/Dual-/Quad-Core Cortex-A9 + NEON, 1GHz	Freescale i.MX6 Single-/Dual-Core Cortex-A9 + NEON, 1GHz
<b>Flash (up to)/RAM (up to)</b>	1 GB + 32 GB (SD Card) / 512 MB	1 GB + 32 GB (SD Card) / 4 GB	1 GB + 32 GB (eMMC) / 1 GB
<b>Ethernet</b>	2	1	1
<b>RS232/Serial</b>	3	3	4
<b>USB Host/Device/SD-Card</b>	1/1/1	4/1/1	1/1/2*
<b>SATA/mPCIe</b>		[1]/1	[1]/1*
<b>Audio</b>	IN/OUT/MIC	IN/OUT/MIC	I <sup>2</sup> S
<b>CAN/I<sup>2</sup>C/SPI</b>	1[2]/1[2]/1	1/1/1	2/2/2
<b>Digital I/O</b>	66**	66**	66**
<b>Touch Panel</b>	4-wire analog resistive, PCAP-Touch via I <sup>2</sup> C	4-wire analog resistive, PCAP-Touch via I <sup>2</sup> C	ext. via I <sup>2</sup> C
<b>LVDS/RGB</b>	[18 Bit]/18 Bit	24 Bit/18 Bit	24 Bit/18 Bit
<b>Temperature range</b>	0°C ... +70°C, [-20°C ... +85°C]	0°C ... +70°C, [-20°C ... +85°C]	0°C ... +70°C, [-20°C ... +85°C/-40°C ... +85°C]
<b>Specials</b>	2D, NEON, FPU	FPU, OpenGL/ES 2.x, 3D, MPEG4	2D, 3D, MPEG4, Camera/Video-IN

[ ] = optional, \* = external, \*\* = with restrictions

**new**

Contact for information: Mr. Frei · Tel. +49(0)7452-6007- 953 · e-mail: p.frei@endrich.com

# NEW JRC'S AUTOMOTIVE OPERATIONAL AMPLIFIER NJU77903



- 1 V<sup>+</sup>
- 2 OUTPUT
- 3 V<sup>-</sup>
- 4 -INPUT
- 5 +INPUT

Left : TO252-5  
Right : DFN8-W2

New JRC's automotive operational amplifier NJU77903 with 36V, 200mAp-p that is suitable for resolver excitation.

## GENERAL DESCRIPTION

The NJU77903 is the best choice for the resolver excitation of a motor rotating shaft angle sensor used in hybrid vehicle or electric vehicle.

So far combining a plurality of operational amplifiers and transistors have corresponded to high output current requirement on the high voltage and high output current application such as resolver exciting circuit. Therefore, it has complicated the circuit design, increased the size of the mounting board and ECU\*1, and reduced the product reliability, that have caused numerous problems.

The NJU77903 can correspond to the maximum rating voltage 40V, the operating voltage 36V, and high output current 200mAp-p with only one operational amplifier. Moreover the NJU77903 can realize the simple circuit design for the mounting board or ECU and the improvement of reliability.

In addition, the NJU77903's capability of high voltage and high output current are also suitable for bias application in semiconductor test equipment and data transmitting output line driver between the equipment.

New JRC have planned the lineup small package DFN8-W2(ESON8-W2) also for industrial equipment and measuring equipment.

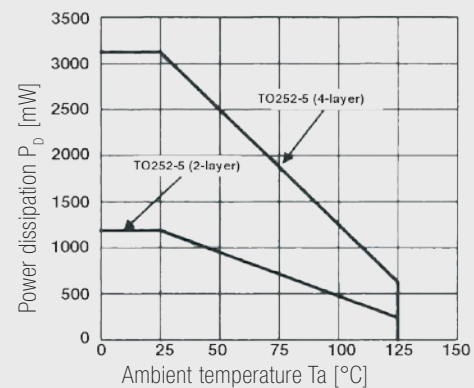
**Tokyo Japan, November 20, 2014** New Japan Radio

Co., Ltd. has provided the operational amplifier **NJU77903** for resolver excitation in automotive electric system that realizes the easy resolver design, makes the mounting board or ECU\*1 smaller and lighter, and improves the reliability of products. The resolver exciting circuit is an angle sensor of a motor rotating shaft used for hybrid vehicle and electric vehicle.

## FEATURES

- » Wide Operating Voltage (6.8V to 36V)
- » High output current ( $\pm 100$ mA typ. (200mApp typ.))
- » Wide Operating Temperature (Topr = -40°C to +125°C)
- » Rail-to-Rail Input / Output
- » Enhanced RF noise immunity
- » Current Consumption (9.5 mA typ.)
- » Open Loop Gain (100 dB typ.)
- » Input Bias Current (1 pA typ.)
- » Slew Rate (3.5V/ $\mu$ s typ.)
- » Unity Gain Frequency (1.5 MHz typ.)
- » Thermal shutdown circuit
- » Current Limit circuit
- » Package Outline (TO252-5,DFN8-W2(ESON8-W2))

## POWER DISSIPATION DERATING CURVE



# new

Contact for information: Mr. Kinn · Tel. +49(0)7452-6007- 21 · e-mail: d.kinn@endrich.com

## HEADQUARTERS

ENDRICH Bauelemente Vertriebs GmbH · P.O.Box 1251 · D-72192 Nagold  
T +49 (0) 7452 6007-0 · F +49 (0) 7452 6007-70  
endrich@endrich.com · www.endrich.com

## SALES OFFICES IN EUROPE

France:

Angers: T +33/2 41 80 33 54 · v.rousseau@endrich.com  
Paris: T +33/1 46 05 99 13 · e.cosperec@endrich.com

Austria & Slovenia

Vienna: T +43/1 66 52 52 521 · a.schwaha@endrich.com

Hungary/Bulgaria:

Budapest: T +361 / 2 97 41 91 · z.kiss@endrich.com

Switzerland – Novitronic:

Zurich: T +41/44 306 91 91 · info@novitronic.ch

Spain:

Barcelona: T +34/93 217 31 44 · spain@endrich.com

