Current Transducer HX 03 .. 50-P/SP2 \( I_{PN} = 3 .. 50 \text{ A} \)

For the electronic measurement of currents: DC, AC, pulsed, mixed, with a galvanic isolation between the primary circuit (high power) and the secondary circuit (electronic circuit).

### Electrical data

<table>
<thead>
<tr>
<th>Primary nominal r.m.s. current ( I_{PN} ) (A)</th>
<th>Primary current measuring range ( I_{MA} ) (A)</th>
<th>Primary Conductor Diameter x Turns</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>± 9</td>
<td>0.6d x 2T</td>
<td>HX 03-P/SP2</td>
</tr>
<tr>
<td>5</td>
<td>± 15</td>
<td>0.8d x 12T</td>
<td>HX 06-P/SP2</td>
</tr>
<tr>
<td>10</td>
<td>± 30</td>
<td>1.0d x 6T</td>
<td>HX 10-P/SP2</td>
</tr>
<tr>
<td>15</td>
<td>± 45</td>
<td>1.4d x 4T</td>
<td>HX 15-P/SP2</td>
</tr>
<tr>
<td>20</td>
<td>± 60</td>
<td>1.6d x 3T</td>
<td>HX 20-P/SP2</td>
</tr>
<tr>
<td>25</td>
<td>± 75</td>
<td>1.6d x 2T</td>
<td>HX 25-P/SP2</td>
</tr>
<tr>
<td>50</td>
<td>± 150</td>
<td>1.2 x 3 x 1T</td>
<td>HX 50-P/SP2</td>
</tr>
</tbody>
</table>

- \( V_{IN} \): Output voltage @ ± \( I_{PN} \), \( R_s = 2 \text{ k\Omega}, T_a = 25^\circ \text{C} \)
- \( R_{IN} \): Output impedance
- \( R \): Loadresistance
- \( V \): Supply voltage (± 5%)
- \( I_1 \): Current consumption <15 mA
- \( V_{ECR} \): R.m.s. voltage for AC isolation test, 50/60Hz, 1 min > 3 kV
- \( V_{ECR} \): R.m.s. voltage for partial discharge extinction at 6 kV
- \( I_{IMP} \): Impulse withstand voltage, 1 s/50µs

### Features
- Galvanic isolation between primary and secondary circuit
- Half-offset measuring principle
- Isolation voltage 3000V
- Low power consumption
- Extended measuring range (3x \( I_{PN} \))
- Single supply from +12V to +15V
- Material according to UL94-V0

### Advantages
- Low insertion losses
- Easy to mount with automatic handling system
- Small size and space saving
- Only one design for wide current range
- High immunity to external interference.

### Applications
- Switched Mode Power Supplies (SMPS)
- AC Variable speed drives
- Uninterruptible Power Supplies (UPS)
- Electrical appliances
- Battery supplied applications
- DC motor drives

### Accuracy-Dynamic performance data

<table>
<thead>
<tr>
<th>( X )</th>
<th>Accuracy @ ( I_{PN}, T_a = 25^\circ \text{C} ) (without offset)</th>
<th>± 1 % of ( I_{PN} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>( E )</td>
<td>Linearly ( 0 \leq \pm I_{PN} )</td>
<td>± 1 % of ( I_{PN} )</td>
</tr>
<tr>
<td>( V_{o} )</td>
<td>Offset voltage, ( T_a = 25^\circ \text{C} )</td>
<td>±2.5V ±50 mV</td>
</tr>
<tr>
<td>( V_{h} )</td>
<td>Hysteresis offset voltage @ ( I_{PN} = 0 )</td>
<td>± 10 mV</td>
</tr>
<tr>
<td>( V_{T} )</td>
<td>Thermal drift of ( V_{o} )</td>
<td>max ± 1.5 mV/K</td>
</tr>
<tr>
<td>( T_{CE} )</td>
<td>Thermal drift of the gain (°C/°C)</td>
<td>± 0.1 °C/K</td>
</tr>
<tr>
<td>( t_{f} )</td>
<td>Response time at 90% of ( I_{PN} )</td>
<td>≤ 3 µs</td>
</tr>
<tr>
<td>( f )</td>
<td>Frequency bandwidth (±3dB)</td>
<td>≤ 50 kHz</td>
</tr>
</tbody>
</table>

### General data

<table>
<thead>
<tr>
<th>( T_a )</th>
<th>Ambient operating temperature</th>
<th>- 25 .. + 85 °C</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T_m )</td>
<td>Ambient storage temperature</td>
<td>- 25 .. + 85 °C</td>
</tr>
<tr>
<td>m</td>
<td>Mass</td>
<td>8 ± 0</td>
</tr>
<tr>
<td>Min. internal creepage distance/clearance</td>
<td>≤ 5.5 mm</td>
<td></td>
</tr>
<tr>
<td>Isolation material group</td>
<td>I</td>
<td></td>
</tr>
<tr>
<td>Standards</td>
<td>EN50178</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**
- With \( R_s = 2 \text{ k\Omega} \)
- Small signal only to avoid excessive heating of the magnetic core
**Description**

Fifth Generation HEXFETs from International Rectifier utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that HEXFET Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO-247 package is preferred for commercial and industrial applications where higher power levels preclude the use of TO-220 devices. The TO-247 is similar but superior to the earlier TO-220 package because of its isolated mounting hole.

**Absolute Maximum Ratings**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{D, SS}$ at $T_s = 100^\circ C$</td>
<td>30</td>
<td>A</td>
</tr>
<tr>
<td>$V_{DS}$ at $T_s = 100^\circ C$</td>
<td>65</td>
<td>V</td>
</tr>
<tr>
<td>$V_{RDS(on)}$</td>
<td>0.075</td>
<td>Ω</td>
</tr>
<tr>
<td>$I_D$</td>
<td>30</td>
<td>A</td>
</tr>
</tbody>
</table>

**Thermal Resistance**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Typ.</th>
<th>Max.</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{thJC}$</td>
<td>0.7</td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>$R_{thCM}$</td>
<td>0.04</td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>$R_{thCA}$</td>
<td>40</td>
<td></td>
<td>°C/W</td>
</tr>
</tbody>
</table>

www.irf.com
Transistor Inverter
Inverter For Air Conditioner
IGBT Gate Drive
Power MOS FET Gate Drive

The TOSHIBA TLP250 consists of a GaAs light emitting diode and an integrated photodetector. This unit is 8-lead DIP package. TLP250 is suitable for gate driving circuit of IGBT or power MOS FET.

- Input threshold current (IPL) = 5mA (min.)
- Supply current (IQCC) = 11mA (max.)
- Supply voltage (VCC) = 10-30V
- Output current (IOL) = 1.5A (max.)
- Switching time (tPH / tPLH) = 0.5μs (max.)
- Isolation voltage: 2500V (min.)
- UL recognized: UL1577, file No. E97338
- Option(D4)

VDE approved - DIN EN60747-5-2
Maximum Operating Insulation Voltage: 2500V
Highest Permissible Over Voltage: 4000V

(Note): When a R560747-5-2 approved type is needed, please designate "Option(D4)."

Truth Table

<table>
<thead>
<tr>
<th>Input LED</th>
<th>T1</th>
<th>T2</th>
</tr>
</thead>
<tbody>
<tr>
<td>On</td>
<td>On</td>
<td>Off</td>
</tr>
<tr>
<td>Off</td>
<td>Off</td>
<td>On</td>
</tr>
</tbody>
</table>

Schematic

A 0.1μF bypass capacitor must be connected between pin 9 and 5. (See Note 5.)
High Performance Modified RISC CPU:
- 32-bit Harvard architecture
- C compiler optimized instruction set architecture with flexible addressing modes
- 64 base instructions
- 24-bit wide instructions, 16-bit wide data path
- 48 Kbytes on-chip Flash program space (16K instruction words)
- 2 Kbytes of on-chip data RAM
- 1 Kbyte of non-volatile data EEPROM
- Up to 30 MIPS operation
  - DC to 10 MHz external clock input
  - 4 MHz to 10 MHz oscillator input with PLL active (4x, 8x, 16x)
- 30 interrupt sources
  - 3 external interrupt sources
  - 8 user selectable priority levels for each interrupt source
  - 4 processor trap sources
- 16 x 16-bit working register array

DSP Engine Features:
- Dual data fetch
- Accumulator write back for DSP operations
- Modulo and Bit-Reversed Addressing modes
- Two, 40-bit wide accumulators with optional saturation logic
- 17-bit x 17-bit single cycle hardware fractional/integer multiplier
- All DSP instructions single cycle
- ± 16-bit origin cycle shift

Peripheral Features:
- High current sink/source I/O pins: 25 mA/25 mA
- Timer module with programmable prescaler:
  - Five 16-bit timers/counters: optionally paired
  - 16-bit timers into 32-bit timer modules
- 16-bit Capture Input functions
- 16-bit Compare/PWM output functions
- 3-wire SPI™ modules (supports 4 Frame modes)
- I2C™ module supports Multi-Master/Slave modes and 7-bit/10-bit addressing
- 2 UART modules with FIFO Buffers
- 1 CAN modules, 28-bit compliant

Motor Control PWM Module Features:
- 6 PWM output channels
  - Complementary or Independent Output modes
  - Edge and Center Aligned modes
  - 3 duty cycle generators
  - Dedicated timer base
  - Programmable output polarity
  - Dead-time control for Complementary mode
  - Manual output control
  - Trigger for A/D conversions

Quadrature Encoder Interface Module Features:
- Phase A, Phase B and Index Pulse input
- 16-bit up/down position counter
- Count direction status
- Position Measurement (x2 and x4) mode
- Programmable digital noise filters on inputs
- Alternate 16-bit Timer/Counter mode
- Interrupt on position counter overflow/underflow
BAGIAN – BAGIAN ALAT

BUCK CHOPPER

dsPIC30f4012

SENSOR ARUS DAN TEGANGAN

DRIVER TLP 250
GAMBAR KESULURUHAN ALAT

LAMPIRAN SERTIFIKAT MENGIKUTI SEMINAR CITEE 2016 DI UNIVERSITAS GAJAH MADA YOGYAKARTA