

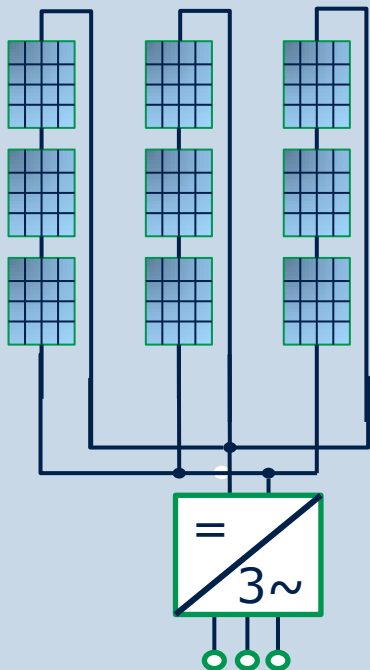
Applications Solar (Central Inverters)

PCIM 2014, Nuremberg



Central Inverter

Three phase AC connection



Power Modules & Drivers

- Power semiconductors
 - EconoPACK™ 4 3-Level
 - EconoDUAL™ 3 3-Level
 - 62mm also 3-Level
 - PrimePACK™ 3
- Driver
 - EiceDRIVER™ family

SMPS and uC

- SMPS Controllers
 - CoolSET™
- Microcontroller
 - XE166 Family
 - XMC4000 ARM™ Family
 - TriCore™ Family

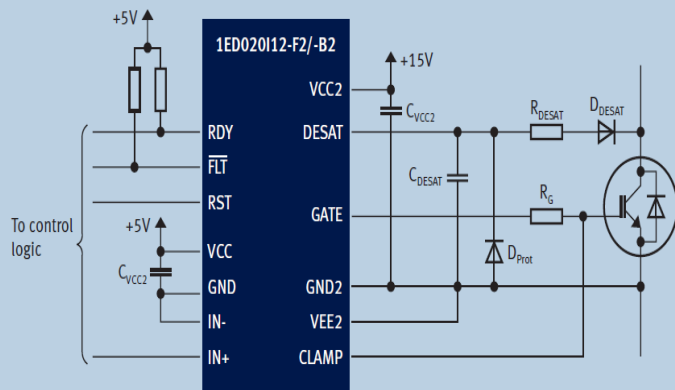


Solar Modules and Semiconductors Solution Overview

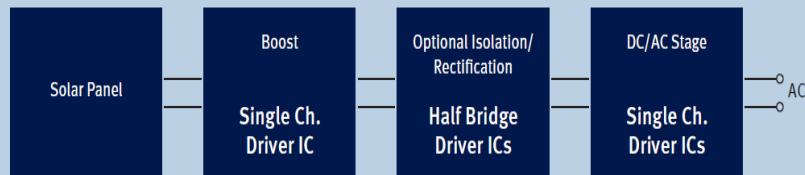
| | Micro Inverters | String Inverters | Central Inverters |
|-----------|-------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| Products | TRENCHSTOP™ 5 CoolMOS™ OptiMOS™  | Easy1B/2B TRENCHSTOP™ 5 SiC JFET Easy1B  | PrimePACK™ EconoPACK™ 4 EconoDUAL™ 3  |
| Power | 100W → 500W | 1kW → 50kW | 100kW → 1MW |
| Frequency | 16kHz → >48kHz | 16kHz → 48kHz | 1kHz → 15kHz |
| |  |  |  |

EiceDRIVER™ Enhanced for Solar

Typical usage 1ED020I12-F2/-B2



General application diagram for solar inverter

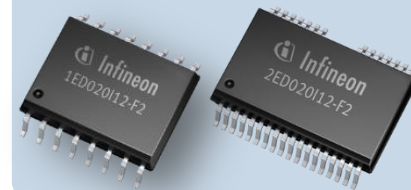


- Single/Dual Channel
- 1EDI30J12CP/CL
- 1ED020I12-F2/-B2
- 2ED020I12-F2
- Half Bridge Driver
- 2ED020I12-FI

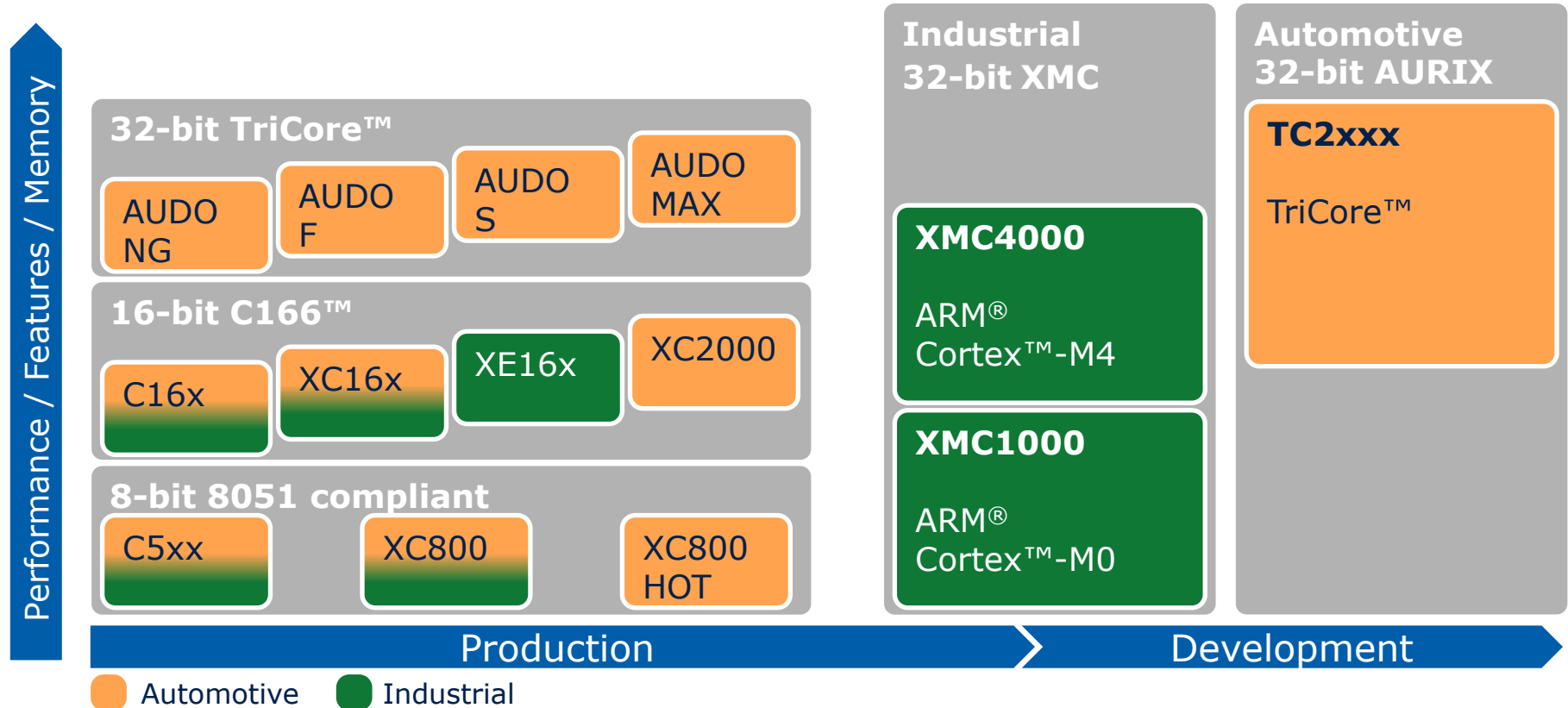
F = Functional Isolation
B = Basic Isolation

Features

- 1200V Coreless Transformer isolated Driver ICs
- Rail-to-rail outputs
- Protection function

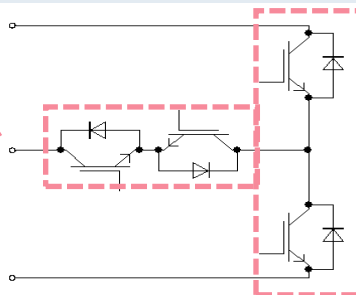


Infinion Microcontrollers enable Customers to differentiate

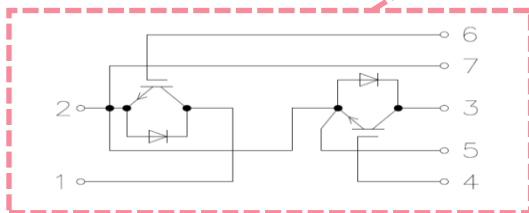


Three-Level Solutions 62mm

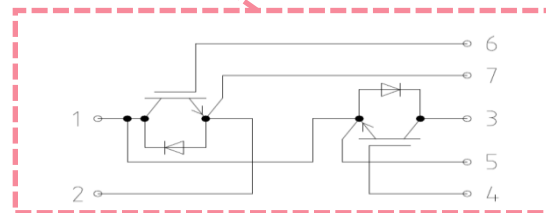
- Due to increasing market demand for 3-level topologies, we offer common emitter modules also in our standard 62mm package.



Single phase 3-level NPC2



Common emitter configuration



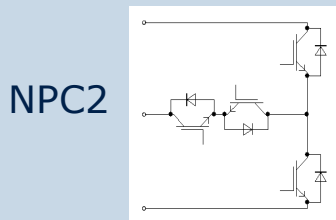
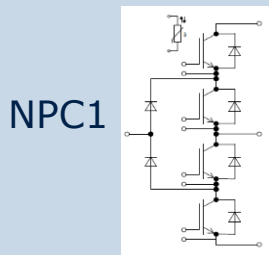
Standard configuration

| Sales Name | Package | Description |
|---------------|---------|--------------------------------------------|
| FF200R12KT3_E | 62mm | Neutral branch of NPC2, IGBT3, 1200V, 200A |
| FF300R12KT3_E | 62mm | Neutral branch of NPC2, IGBT3, 1200V, 300A |
| FF400R12KT3_E | 62mm | Neutral branch of NPC2, IGBT3, 1200V, 400A |
| FF300R12KE4_E | 62mm | Neutral branch of NPC2, IGBT4, 1200V, 300A |
| FF450R12KE4_E | 62mm | Neutral branch of NPC2, IGBT4, 1200V, 450A |

Three-Level Solutions

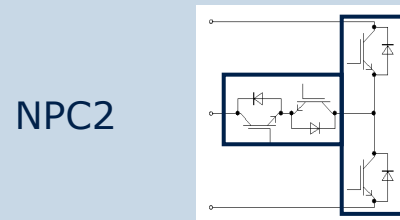
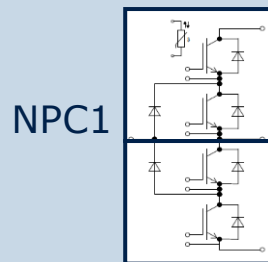
EconoPACK™ 4 3-Level

- NPC1 650V
- NPC2 650V /1200V
- Complete phase leg in one EconoPACK™ 4
- Enables robust inverter designs due to PressFIT and injection-molded terminals
- State of the art IGBT technology



EconoDUAL™ 3 3-Level

- NPC1 650V
- NPC2 650V /1200V
- Enables high efficiency inverter designs due to NPC topology
- Enables robust inverter designs due to PressFIT and injection-molded terminals
- State of the art IGBT technology



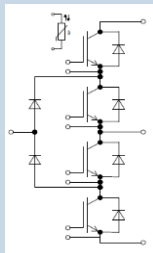
Three-Level Solutions EconoPACK™ 4

EconoPACK™ 4 3-Level

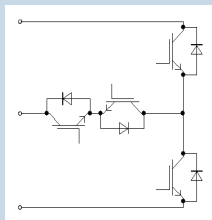
- NPC1 650V
- NPC2 650V /1200V
- Complete phase leg in one EconoPACK™ 4
- Enables robust inverter designs due to PressFIT and injection-molded terminals
- State of the art IGBT technology



NPC1

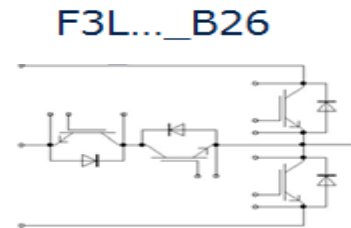
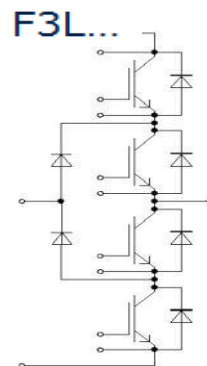


NPC2



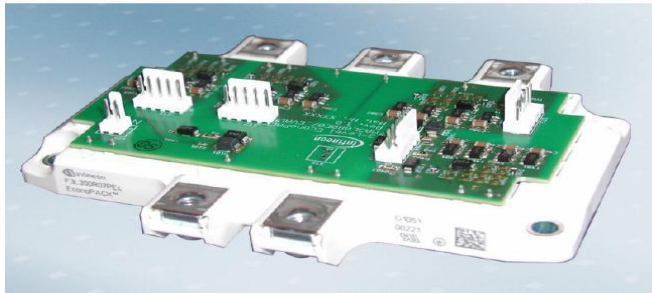
| I_c [A] | 650V NPC-1 | 650V NPC-2 | 1200V NPC-2 |
|-----------|---------------|------------------|------------------|
| 200 | F3L200R07PE4 | | |
| 300 | F3L300R07PE4 | | F3L300R12PT4_B26 |
| 400 | | F3L400R07PE4_B26 | F3L400R12PT4_B26 |

in series production



EconoPACK™ 4 3-Level Solutions with Evaluation Boards

Two PCB Solution for single Module or Paralleling



EconoPACK™ 4 3-Level NPC1:

- Application notes AN2011-03
- and AN2011-04 available.
- MA3L080E07-Eval available.
- F3L020E07-F-P-Eval available.



EconoPACK™ 4 3-Level NPC2:

- Application notes AN2012-03, AN2012-04 and AN2013-02 for NPC2 available.
- Boards (F3L2020Exx-F-P_EVAL & MA3L120Exx_EVAL) available.



Three-Level Solutions EconoDUAL™ 3

I_C [A]

**650 V
EconoDUAL™ 3**

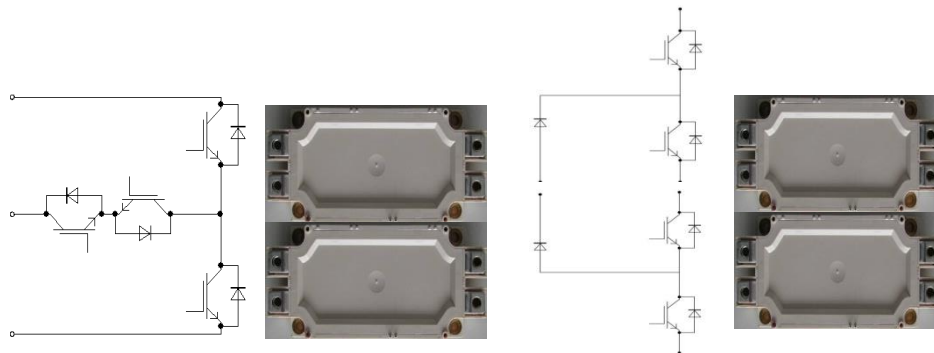
**1200 V
EconoDUAL™ 3**

300

**F3L300R12MT4_B22
F3L300R12MT4_B23**

400

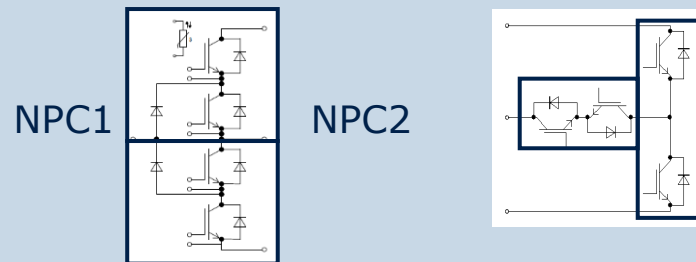
**F3L400R07ME4_B22
F3L400R07ME4_B23**



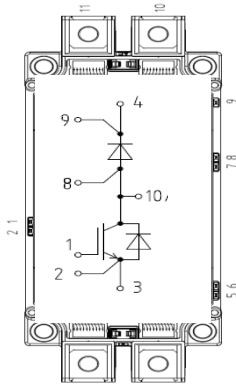
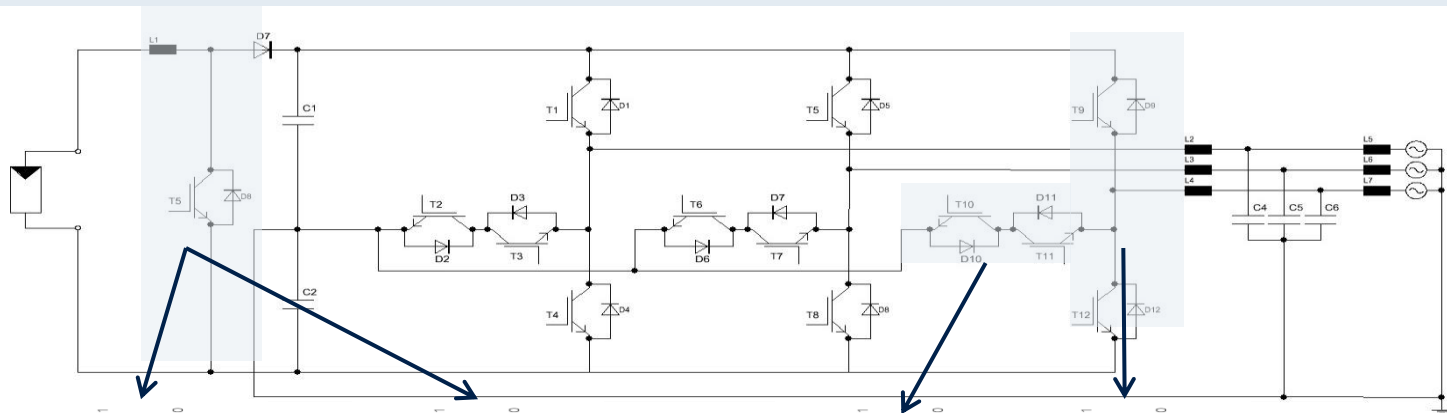
EconoDual™ 3 3-Level



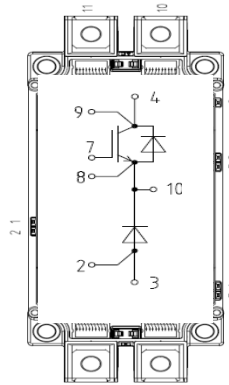
- NPC1 650V
- NPC2 650V /1200V
- Enables high efficiency inverter designs due to NPC topology
- Enables robust inverter designs due to PressFIT and injection-molded terminals
- State of the art IGBT technology



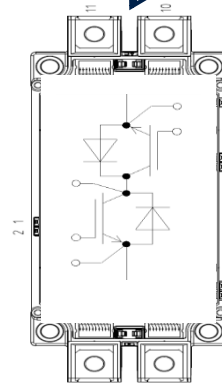
Three-Level Solutions Central Inverter



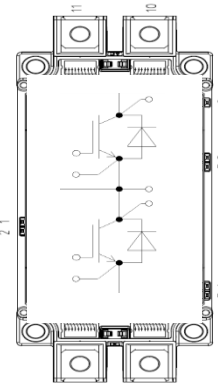
■ Positive
Booster



■ Negative
Booster



■ Common
Collector

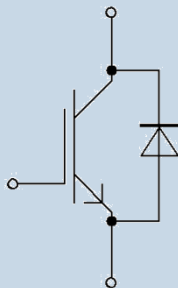


■ Standard
module

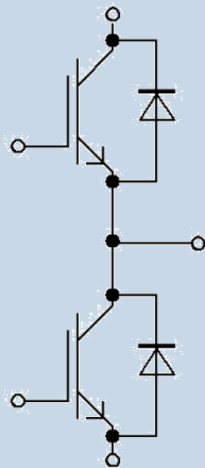
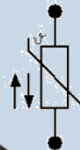
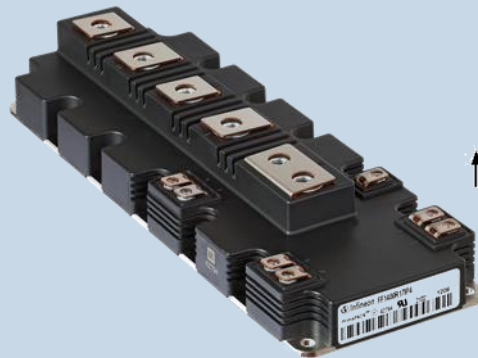
■ Standard half
bridge module and
common collector
module

High Power Modules IHM-B and PrimePACK™ 3

- IHM-B Single-Switch
- High flexibility
- High reliability
- High efficiency
- 3-Level topology possible if properly combined



- PrimePACK™ 3 Half-Bridge
- High efficiency
- High reliability
- Ideal for standard topologies





ENERGY EFFICIENCY MOBILITY SECURITY

Innovative semiconductor solutions for energy efficiency, mobility and security.

