

# Industrial applications

MagnaChip product Portfolios of Industrial applications are discrete IGBT, MV MOSFET and SJ MOSFET. MagnaChip delivers semiconductor to contribute in minimizing power loss and maximizing power savings of entire systems in wide industrial applications.



## Drives

- General inverter
- Sewing machine
- Treadmill



## Renewable Energy

- Solar inverter
- Wind power
- Energy storage



## Power tool

- Electric saw
- Vacuum cleaner
- Motor drill



## E-vehicles

- E-bike
- Segway
- Electric wheelchair

MagnaChip solution

## Discrete IGBT

### ■ Key features & benefits

- 650V/1200V, 25A/40A/50A/60A
- Field Stop Trench
- Low  $V_{ce(sat)}$  and High Speed
- High ruggedness for industrial applications

### ■ Major applications



### ■ Products lists

| Type              | Product Number  | $V_{CES}$ [V] | $I_C$ [A]<br>100°C | $V_{ce(sat)}$ [V] | Short circuit [μs] | Package |
|-------------------|-----------------|---------------|--------------------|-------------------|--------------------|---------|
| Low $V_{CE(sat)}$ | MBQ40T65FEHCTH  | 650           | 40                 | 1.6               | 5                  | TO-247  |
|                   | MBQ50T65FEHCTH  | 650           | 50                 | 1.6               | 5                  | TO-247  |
| High speed        | MBQ40T65FESCTH  | 650           | 40                 | 1.95              | 5                  | TO-247  |
|                   | MBQ50T65FESCTH  | 650           | 50                 | 1.95              | 5                  | TO-247  |
|                   | MBQ60T65PESTH   | 650           | 60                 | 1.9               | 5                  | TO-247  |
|                   | MBQ25T120FESCTH | 1200          | 25                 | 2                 | 10                 | TO-247  |
|                   | MBQ40T120FESTH  | 1200          | 40                 | 2                 | 10                 | TO-247  |
|                   | MBQ40T120PESTH  | 1200          | 40                 | 1.65              | 10                 | TO-247  |

MagnaChip solution

## MV MOSFET

### ■ Key features & benefits

- 40V/60V/80V/100V/150V
- Optimized Motor Drive MOSFET
- Suitable for Synchronous Rectification and Motor Drive applications
- 100% UIL & Rg tested

### ■ Major applications



### ■ Products lists

| Product Number | $V_{DS}$ [V] | $I_D$ [A]<br>= 25°C | $V_{GS(th)}$ [V, Max] | $R_{ds(on)}$ [Ohm Max]<br>at $V_{GS}=10V$ | Package |
|----------------|--------------|---------------------|-----------------------|---|---------|
| MDU04N010VRH   | 40           | 100                 | 2.0                   | 1.0                                       | PDFN56  |
| MDU1721VRH     | 40           | 100                 | 3.0                   | 1.4                                       | PDFN56  |
| MDU06N031VRH   | 60           | 100.0               | 4.0                   | 3.1                                       | PDFN56  |
| MDU06N150RH    | 60           | 100                 | 2.5                   | 15.0                                      | PDFN56  |
| MDP1930TH      | 80           | 120.0               | 4.0                   | 2.3                                       | TO-220  |
| MDP10N055TH*   | 100          | 120.0               | 5.5                   | 4.5                                       | TO-220  |
| MDE10N054RH*   | 100          | 120.0               | 5.4                   | 4.5                                       | D2PAK   |
| MDF1921TH      | 100          | 60.0                | 4.0                   | 4.8                                       | TO-220F |
| MDV10N150VRH*  | 100          | 40                  | 2.0                   | 15.0                                      | PDFN33  |
| MDP15N075TH*   | 150          | 120.0               | 4.5                   | 7.5                                       | TO-220  |
| MDD1051RH      | 150          | 28                  | 3.2                   | 46.0                                      | DPAK    |

\* : Under development

MagnaChip solution

## SJ MOSFET

### ■ Key features & benefits

- High performance : Good FOM
- High reliability & high ruggedness
- Easy to use : Optimal Rg
- Various packages

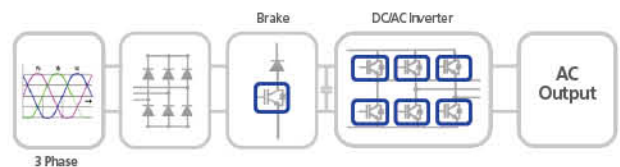
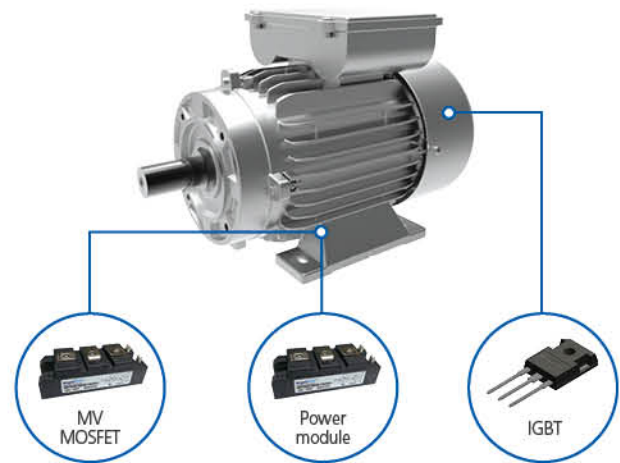
### ■ Products lists

| Product Number | $V_{DS}$ [V] | $I_D$ [A]<br>= 25°C | $V_{GS(th)}$ [V, Max] | $R_{ds(on)}$ [Ohm Max]<br>at $V_{GS}=10V$ |       | Qg [nC, Typ] | Package  |
|----------------|--------------|---------------------|-----------------------|---|-------|--------------|----------|
|                |              |                     |                       | Max                                       | Typ   |              |          |
| MME60R290PRH   | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 33           | TO-263   |
| MMF60R115PTH   | 600          | 33.0                | 4.0                   | 0.115                                     | 0.104 | 79           | TO-220F  |
| MMF60R190PTH   | 600          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 51           | TO-220F  |
| MMF60R190QTH   | 600          | 20.0                | 3.5                   | 0.190                                     | TBD   | TBD          | TO-220F  |
| MMF60R290PTH   | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 33           | TO-220F  |
| MMP60R195PCTH  | 600          | 20.0                | 4.0                   | 0.195                                     | 0.175 | 44           | TO-220   |
| MMUB60R199PCRH | 600          | 20.0                | 4.0                   | 0.199                                     | 0.180 | 44           | PDFN88   |
| MMFT60R115PCTH | 600          | 33.0                | 4.0                   | 0.115                                     | 0.104 | 77           | TO-220FT |
| MMFT60R290PCTH | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 32           | TO-220FT |
| MMFT60R195PCTH | 600          | 20.0                | 4.0                   | 0.195                                     | 0.175 | 44           | TO-220FT |
| MMP60R290PCTH  | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 32           | TO-220   |
| MMFT60R195PTH  | 600          | 20.0                | 4.0                   | 0.195                                     | 0.175 | 51           | TO-220FT |
| MMFT60R290PTH  | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 33           | TO-220FT |
| MMFT60R290PCTH | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 33           | TO-220FT |
| MML60R190PTH   | 600          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 51           | TO-262   |
| MML60R290PTH   | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 33           | TO-262   |
| MMP60R190PTH   | 600          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 51           | TO-220   |
| MMP60R290PTH   | 600          | 13.0                | 4.0                   | 0.290                                     | 0.260 | 33           | TO-220   |
| MMQ60R070PTH   | 600          | 53.0                | 4.0                   | 0.070                                     | 0.063 | 132          | TO-247   |
| MMQ60R115PCTH  | 600          | 33.0                | 4.0                   | 0.115                                     | 0.104 | 77           | TO-247   |
| MMQ60R115PTH   | 600          | 33.0                | 4.0                   | 0.115                                     | 0.104 | 79           | TO-247   |
| MMQ60R190PTH   | 600          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 51           | TO-247   |
| MML65R190PTH   | 650          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 53           | TO-262   |
| MMF65R190PTH   | 650          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 53           | TO-220F  |
| MMP65R190PTH   | 650          | 20.0                | 4.0                   | 0.190                                     | 0.170 | 53           | TO-220   |
| MMFT65R195PTH  | 650          | 20.0                | 4.0                   | 0.195                                     | 0.175 | 53           | TO-220FT |
| MMUB65R120QRH* | 650          | TBD                 | 4.0                   | 0.120                                     | TBD   | TBD          | PDFN88   |
| MMUB65R090QRH* | 650          | TBD                 | 4.0                   | 0.090                                     | TBD   | TBD          | PDFN88   |

\* : Under development

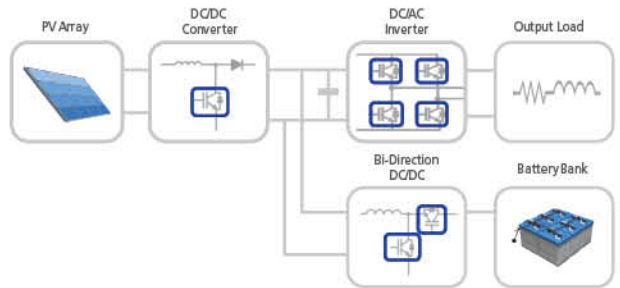


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Motor drives



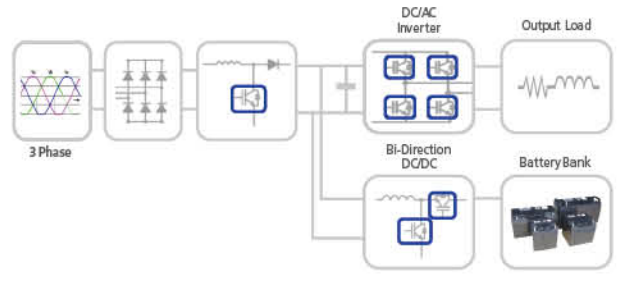
| Block          | Topology                 | Product group | Voltage       | Recommendation   |
|----------------|--------------------------|---------------|---------------|--|
| DC-AC Inverter | Half bridge/ Full bridge | Discrete IGBT | 650           | MBQ40T65FESCSTH<br>MBQ50T65FESCSTH<br>MBQ60T65PESTH      |
|                |                          |               | 1200          | MBQ40T120FESTH<br>MBQ40T120PESTH                         |
|                |                          | IGBT module   | 1200          | MPMB(C/D)100/200/300B120RH                               |
|                | Rectifier                | Diode         | 400/600 /1200 | MPKB2CA100/150U40/60/120RH<br>MPKC2CA200/300U40/60/120RH |

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Renewable energy



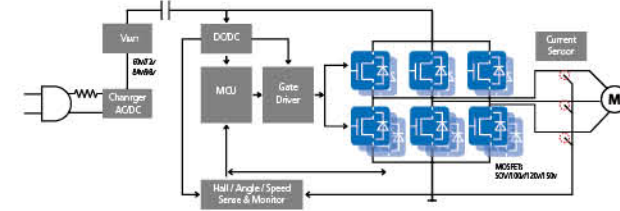
| Block          | Topology                 | Product group | Voltage       | Recommendation   |
|----------------|--------------------------|---------------|---------------|--|
| DC-AC Inverter | Half bridge/ Full bridge | Discrete IGBT | 650           | MBQ40T65FESCSTH<br>MBQ50T65FESCSTH<br>MBQ60T65PESTH      |
|                |                          |               | 1200          | MBQ40T120FESTH<br>MBQ40T120PESTH                         |
|                |                          | IGBT module   | 1200          | MPMB(C/D)100/200/300B120RH                               |
|                | Rectifier                | Diode         | 400/600 /1200 | MPKB2CA100/150U40/60/120RH<br>MPKC2CA200/300U40/60/120RH |

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UPS



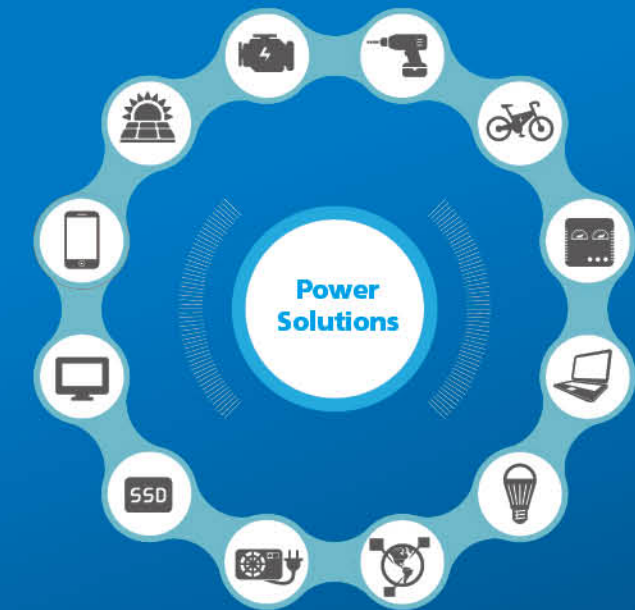
| Block          | Topology                 | Product group | Voltage       | Recommendation   |
|----------------|--------------------------|---------------|---------------|--|
| DC-AC Inverter | Half bridge/ Full bridge | Discrete IGBT | 650           | MBQ40T65FESCSTH<br>MBQ50T65FESCSTH<br>MBQ60T65PESTH      |
|                |                          |               | 1200          | MBQ40T120FESTH<br>MBQ40T120PESTH                         |
|                |                          | IGBT module   | 1200          | MPMB(C/D)100/200/300B120RH                               |
|                | Rectifier                | Diode         | 400/600 /1200 | MPKB2CA100/150U40/60/120RH<br>MPKC2CA200/300U40/60/120RH |

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E-vehicles



| Block          | Topology                 | Product group | Voltage | Recommendation               |
|----------------|--------------------------|---------------|---------|------------------------------|
| DC-AC Inverter | Half bridge/ Full bridge | MV MOSFET     | 40V     | MDU04N010RH                  |
|                |                          |               | 60V     | MDES06N010RH*                |
|                |                          |               | 80V     | MDP1930TH                    |
|                |                          |               | 100V    | MDP10N055TH*<br>MDE10N054RH* |
|                |                          |               | 150V    | MDP15N075TH                  |

\*: Under development



MagnaChip Sales Network

| Korea  | Taiwan  |
|--|---|
| <p>Seoul Office<br/>#424, Teheran-ro, Gangnam-gu, Seoul, 135-738, Korea<br/>Tel +82-2-6903-3843<br/>E-mail koreasales@magnachip.com</p> <p>Gilheung Office<br/>5fl, 880 Station 5, Samsung 1-ro 5-gil, Hwasong-si, Gyeonggi-do, Korea<br/>Tel +82-31-8015-3122-6<br/>E-mail koreasales@magnachip.com</p> <p>Paju Office<br/>#304, Samsung Plaza, 890-3, Geumchon-dong, Paju-si, Gyeonggi-do, Korea<br/>Tel 82-31-8071-1386<br/>E-mail koreasales@magnachip.com</p> <p>Gumi Office<br/>#171, Insoo-dong, Gumi-si, Gyeongangbuk-do, 730-723, Korea<br/>Tel +82-54-470-1422<br/>E-mail koreasales@magnachip.com</p> | <p>Taiwan Office<br/>2F, No. 61, Chowbe Street, NeiHu Dist, Taipei City, 114, Taiwan, R.O.C.<br/>Tel +886-2-2657-7898<br/>E-mail taiwansales@magnachip.com</p>  |
| Japan  | Europe  |
| <p>Paju Office<br/>#304, Samsung Plaza, 890-3, Geumchon-dong, Paju-si, Gyeonggi-do, Korea<br/>Tel 82-31-8071-1386<br/>E-mail koreasales@magnachip.com</p> <p>Gumi Office<br/>#171, Insoo-dong, Gumi-si, Gyeongangbuk-do, 730-723, Korea<br/>Tel +82-54-470-1422<br/>E-mail koreasales@magnachip.com</p>  | <p>Japan Office<br/>Shinjyosaka Trust Tower 2F, 3-5-36 Myahara, Yodogawa-ku, Osaka 532-0003, Japan<br/>Tel +49-160-9478-6327<br/>E-mail japansales@magnachip.com</p> <p>Europe Office<br/>Watzmannring 37 85748 Garching, Germany<br/>Tel +49-160-9478-6327<br/>E-mail europeasales@magnachip.com</p> |
| China  | USA   |
| <p>Shanghai Office<br/>Room E, 8F, Luchsen International Building 1063 Wuzhong Road, @201103, Shanghai, China<br/>Tel +86-21-6475-1521<br/>E-mail chinasales@magnachip.com</p> <p>Shenzhen Office<br/>Room 2003B, 20F, International Chamber of Commerce Tower, Futaba 3 Road, Futian District, Shenzhen, China<br/>Tel +86-755-8831-5561<br/>E-mail chinasales@magnachip.com</p>  | <p>USA Office<br/>60 South Market street, suite 750, San Jose, CA 95113, USA<br/>Tel +1-408-625-5999<br/>E-mail ussales@magnachip.com</p>   |