

Product brief

Infineon® Eco Blocks

Thyristor/diode and single thyristor modules in pressure contact technology 1600-2200 V/60-70 mm (TT, TZ, TD and DD topologies)

The increasing demand for cost effective solutions for bipolar modules is driving the trend for the conversion from Pressure Contact (PC) to Solder Contact (SC) technology. This change has led to different market share situation between these two technologies for different foot prints. Main reasons are the missing ability for paralleling thyristors due to negative temperature coefficient in conducting state and rising safety requirements for rectifier circuits, playing a key role in arcing prevention due to their vulnerable location between the grid and DC-link.

Due to the fact that thyristors reduce their on-state voltage drop with rising temperature, they tend – when put in parallel – to take more and more current into that device which already has higher junction temperature due to current imbalance which leads to thermal runaway. For this reason the SC modules – like the PC modules – are built with only one chip per switch, which is getting bigger with the foot print.

Regarding safety, the PC technology offers the short-on-fail behavior which means, that in case of significantly higher current than the rated surge current, the device is destroyed by gradually melting of the compressed thyristor element and alloying with the assembly inside the module. This process always produces a “short connection” independently of the magnitude of the overcurrent, whereas the SC technology in most cases results in open solder connections leading to plasma ejection and broken module housing.

Customer benefits

- > Designed for pure function with proven reliability
- > Best power-to-price ratio
- > Reduced failure and system costs

Key features

- > Complete re-design of 60 mm and 70 mm package
- > Proven pressure contact technology with short-on-fail feature
- > Best-in-class DC blocking capability



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For these reasons the price gap between SC and PC is getting smaller when getting to bigger modules (difficulty in soldering chips rises with their size) and because the measures undertaken for arcing protection become more sophisticated for larger power ranges the short-on-fail feature offered only in PC technology becomes more important with bigger foot print.

Therefore the small modules (20 mm and 34 mm foot print) are more or less completely converted into SC technology, the medium size modules (50 mm) are currently 50/50 and the large modules (60 mm and 70 mm) are only available in PC technology.

In order to serve the demand for cost improvement also for larger modules we have completely redesigned our 60 mm and 70 mm PC module keeping its standard dimensions but being consequently driven by the design-to-cost approach to reduce the amount of material used. We did more than just cost reduction: we removed over-engineering and features for niche applications so that the majori-

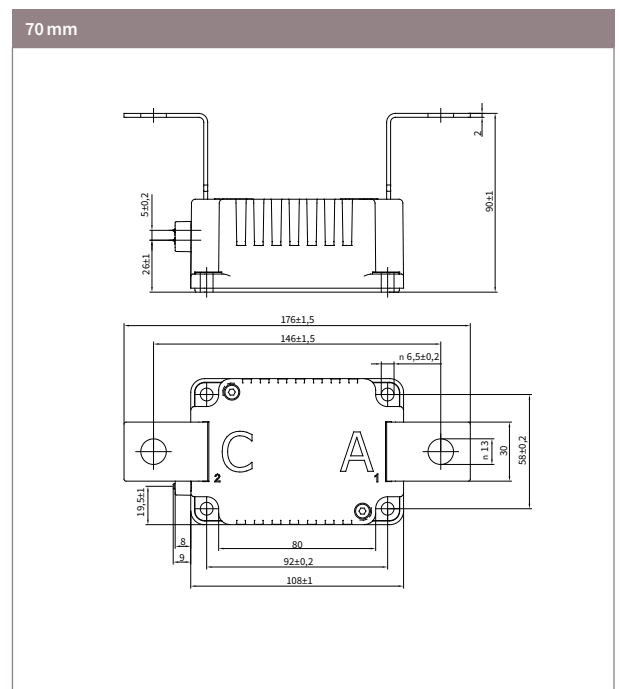
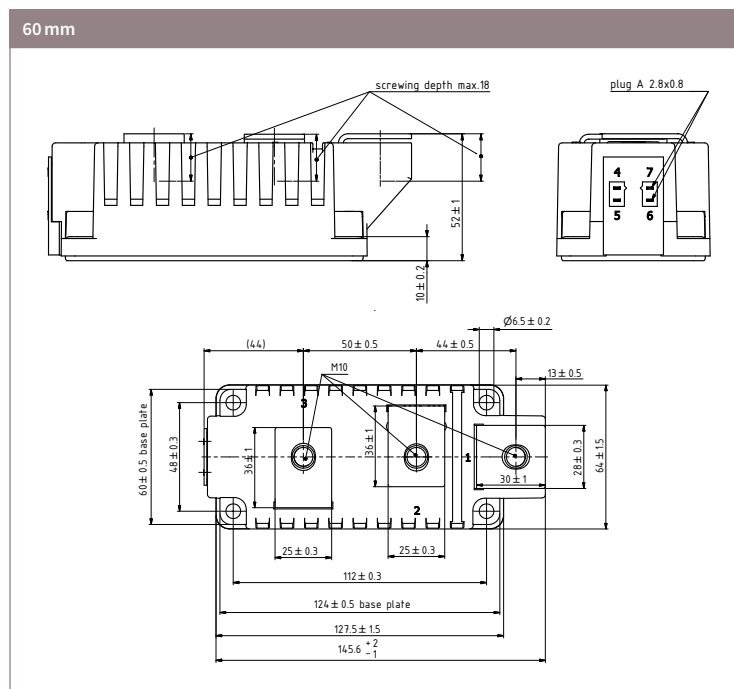
ty of customers is not paying for features they do not need. The module has been reduced to its essential functions keeping the PC technology and our well-known reliability leading to outstanding lifetime. Our PC technology modules in general provide best-in-class thyristor and diode blocking stability over whole life time. Furthermore the PC technology with its arcing prevention allows simpler safety concept in terms of unit shielding and fusing effort. All these features help to reduce failure and system cost.

As a result we offer the Eco Line 60 mm and 70 mm module with the short-on-fail feature and high overload capability hand-in-hand with highest competitiveness for a 60 mm and 70 mm PC module in the market. Due to higher junction temperature the Eco Line is right fit for air-cooled applications. In order to get the optimum performance and keep customer's production fast and clean the next product extension will be pre-applied Thermal Interface Material (TIM).

Reduced to pure function.
With proven reliability.

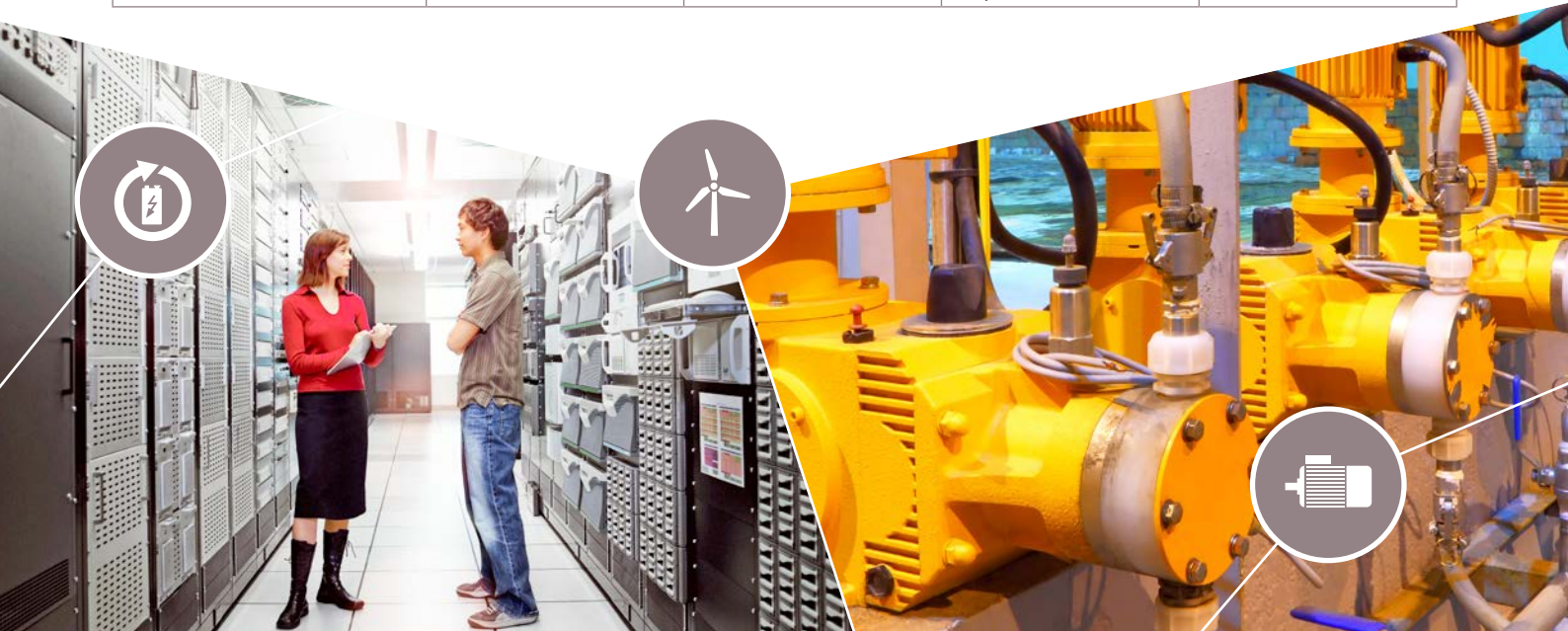


TT/TD and DD
outline dimensions 60-70 mm



Sales Information

Sales product	Housing [mm]	Max. V_{DRM} V_{RRM} [V]	I_{TAVM}/T_C [A/C°] @180° el sin	I_{TSM} [A] @10ms, T_{vj} max
Eco Line – thyristor / diode modules				
ETT420N22P60	60	2200	420/85	11400
ETD420N22P60	60	2200	420/85	11400
ETT480N22P60	60	2200	480/85	12000
ETD480N22P60	60	2200	480/85	12000
ETT540N22P60	60	2200	540/85	13300
ETD540N22P60	60	2200	540/85	13300
ETT510N16P60	60	1600	510/85	12800
ETD510N16P60	60	1600	510/85	12800
ETT580N16P60	60	1600	580/85	13600
ETD580N16P60	60	1600	580/85	13600
ETT630N16P60	60	1600	630/85	14700
ETD630N16P60	60	1600	630/85	14700
Eco Line – single thyristor modules				
ETZ950N22P70	70	2200	923/85	25100
ETZ1100N16P70	70	1600	1051/85	28200



Infineon® Power Blocks / Prime Blocks

Thyristor/diode modules in pressure contact technology up to 4000 V/60 mm

For water-cooled applications, heavy overload conditions and blocking voltages up to 4000 V we offer the Power Line 60 mm modules:

Sales product	Housing [mm]	Max. V_{DRM} V_{RRM} [V]	I_{TAVM}/T_C [A/C°] @180° el sin	I_{TSM} [A] @10ms, $T_{vj\ max}$
Power Line – thyristor / diode modules				
TT240N36KOF	60	3600	240/85	5500
TD240N36KOF	60	3600	240/85	5500
TT310N26KOF	60	2600	310/85	9000
TD310N26KOF	60	2600	310/85	9000
TT400N26KOF	60	2600	400/85	11000
TD400N26KOF	60	2600	400/85	11000
TT430N22KOF	60	2200	430/85	12000
TD430N22KOF	60	2200	430/85	12000
DD435N40K	60	4000	435/85	12000
TT500N16KOF	60	1600	500/85	14500
TD500N16KOF	60	1600	500/85	14500
TT520N22KOF	60	2200	520/85	14500
TD520N22KOF	60	2200	520/85	14500
TT570N16KOF	60	1600	570/87	14000
TD570N16KOF	60	1600	570/87	14000
TT600N16KOF	60	1600	600/85	17500
TD600N16KOF	60	1600	600/85	17500

For highest performance or when the desired current exceeds 600 A and paralleling of modules is not an option we have designed the Prime Line 60 mm module with best-in-class power density reaching 790 A in the standard 60 mm housing.

Sales product	Housing [mm]	Max. V_{DRM} V_{RRM} [V]	I_{TAVM}/T_C [A/C°] @180° el sin	I_{TSM} [A] @10ms, $T_{vj\ max}$
Prime Line – thyristor / diode modules				
TT700N22KOF	60	2200	700/85	20400
TD700N22KOF	60	2200	700/85	20400
TT820N16KOF	60	1600	820/85	24800
TD820N16KOF	60	1600	820/85	24800

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