

Product brief

Infineon® Eco Blocks

Thyristor/diode modules in pressure contact technology

1600-2200 V/60 mm

(TT, 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

- > Best power-to-price ratio
- > Reduced failure & system costs
- > Predictable performance over entire lifetime
- > Slim, sustainable and environmentally friendly
- > Ready for safety applications

Key features

- > Complete re-design of our proven pressure contact technology
- > Short-on-fail capability
- > Best-in-class DC blocking capability
- > Higher operational temperature
- > Standard housing dimensions



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Thyristor/diode modules in pressure contact technology 1600-2200 V/60 mm

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 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 majority of customers is not paying for features they do not need.

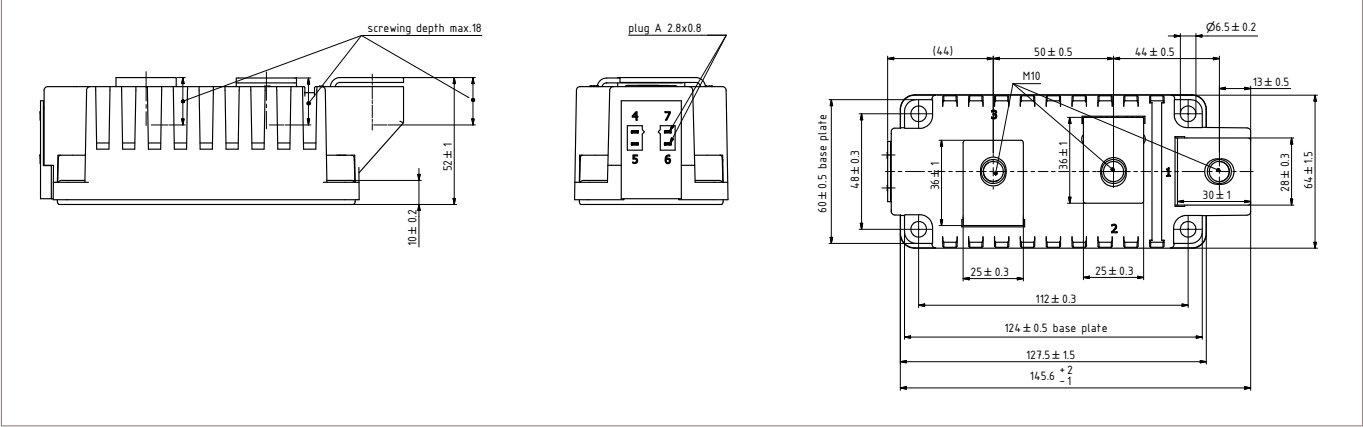
The module has been reduced to its essential functions keeping the PC technology and our well-known reliability leading to outstanding lifetime. Our PC technology modules in general provide best-in-class thyristor and diode blocking stability over whole life time. Furthermore the PC technology with its 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 module with the short-on-fail feature and high overload capability hand-in-hand with highest competitiveness for a 60 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 mm



Sales Information

Sales product	Housing	V_{DRM} / V_{RRM}	I_{TAVM}	I_{TSM}
Eco Line - Thyristor / diode modules				
ETT420N22P60	60 mm	2200 V	420	11400
ETD420N22P60	60 mm	2200 V	420	11400
ETT480N22P60	60 mm	2200 V	480	12000
ETD480N22P60	60 mm	2200 V	480	12000
ETT540N22P60	60 mm	2200 V	540	13300
ETD540N22P60	60 mm	2200 V	540	13300
ETT510N16P60	60 mm	1600 V	510	12800
ETD510N16P60	60 mm	1600 V	510	12800
ETT580N16P60	60 mm	1600 V	580	13600
ETD580N16P60	60 mm	1600 V	580	13600
ETT630N16P60	60 mm	1600 V	630	14700
ETD630N16P60	60 mm	1600 V	630	14700



Infineon® Power Blocks / Prime Blocks

Thyristor/diode modules in pressure contact technology
1600-4000 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	$V_{\text{DRM}} / V_{\text{RRM}}$	I_{TAVM}	I_{TSM}
Power Line – Thyristor / diode modules				
TT240N36KOF	60 mm	3600 V	240	5500
TD240N36KOF	60 mm	3600 V	240	5500
TT310N26KOF	60 mm	2600 V	310	9000
TD310N26KOF	60 mm	2600 V	310	9000
TT400N26KOF	60 mm	2600 V	400	11000
TD400N26KOF	60 mm	2600 V	400	11000
TT430N22KOF	60 mm	2200 V	430	12000
TD430N22KOF	60 mm	2200 V	430	12000
DD435N40K	60 mm	4000 V	435	12000
TT500N16KOF	60 mm	1600 V	500	14500
TD500N16KOF	60 mm	1600 V	500	14500
TT520N22KOF	60 mm	2200 V	520	14500
TD520N22KOF	60 mm	2200 V	520	14500
TT570N16KOF	60 mm	1600 V	570	14000
TD570N16KOF	60 mm	1600 V	570	14000
TT600N16KOF	60 mm	1600 V	600	17500
TD600N16KOF	60 mm	1600 V	600	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	$V_{\text{DRM}} / V_{\text{RRM}}$	I_{TAVM}
Prime Line – Thyristor / diode modules			
TT680N22KOF	60 mm	2200 V	700
TD680N22KOF	60 mm	2200 V	700
TT790N16KOF	60 mm	1600 V	820
TD790N16KOF	60 mm	1600 V	820

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