

**KEC Power Module meets demands for
Energy-saving and Eco friendly semiconductors.
Wherever electric power or motor control is needed.**

KEC Power Module

KEC

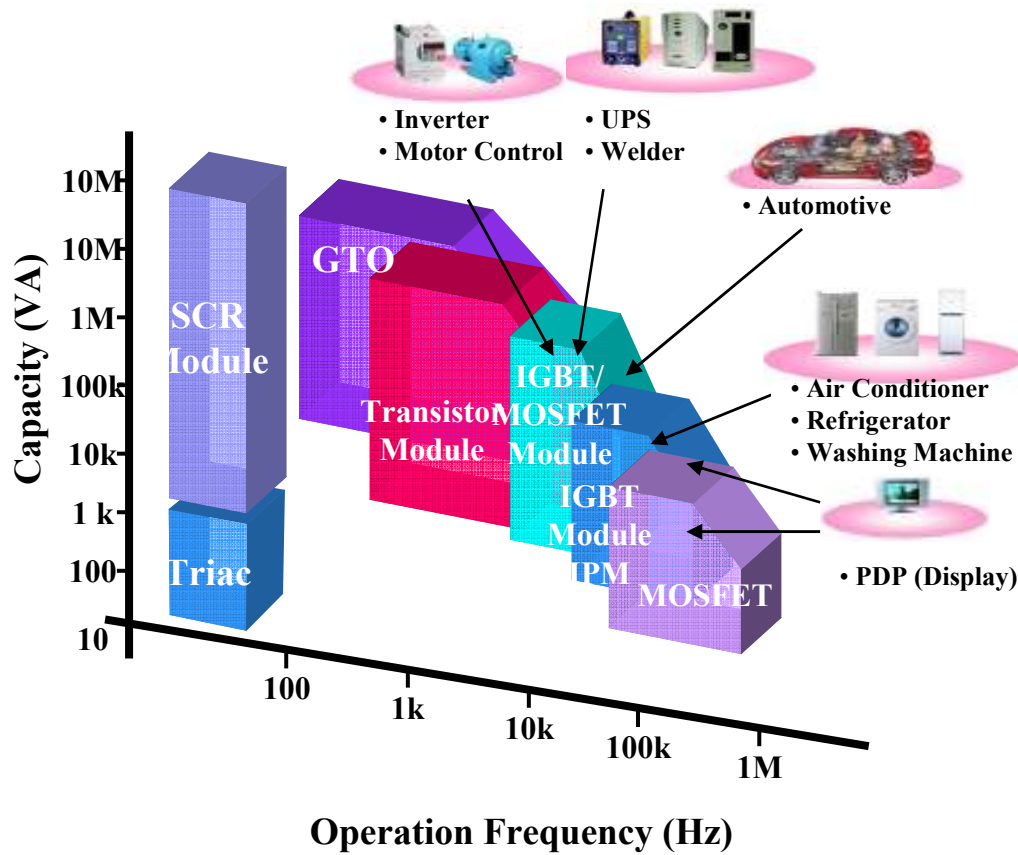


2009.



For the power devices, we also plan to improve Energy efficiency, develop the technology for reduction of power consumption and increase the product line up.

Forecast
Now



		IPM	IGBT Module	Diode/SCR Module
Industrial	Electric Power		Now	Forecast
	Automotive	Forecast	Now	
	UPS		Now	Forecast
	Inverter		Now	
	Motor Control	Forecast	Now	Forecast
	Welder		Forecast	
	Medical equipment		Now	
H/A	Air conditioner	Forecast		
	Refrigerator	Forecast		
	Washing machine	Forecast		



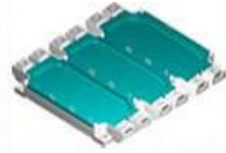
**POWER
Module**

STD IGBT

Standard
IGBT /
2, 4, 6 PACK



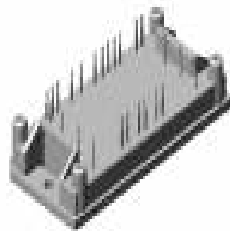
2 pack



4 pack

CIB IGBT

Converter -
Brake -
Inverter /
7 PACK



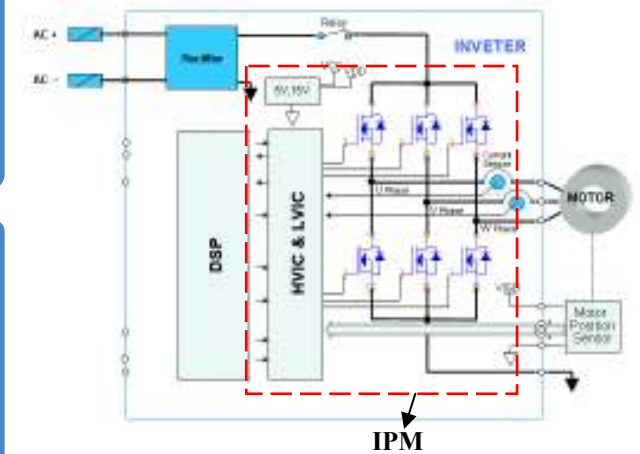
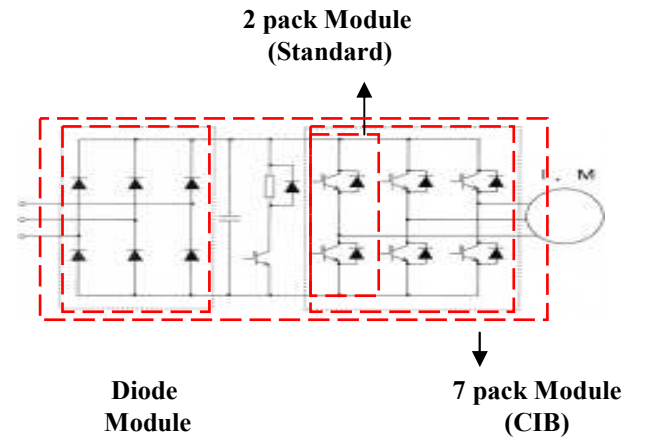
6 pack



7 pack

IPM

Intelligent
Power Module
/ Custom
package



The Industry's Leading Technologies and a Wide Range Products

● **Feature**

- A. New package design for less environmental pollution which also contributes to energy saving due to reduced power loss.**
- B. Since we offer a variety of models in terms of voltage, current, our power module can be used in a wide range of application from inverters, UPS, VVVF.**
- C. The ease of both installation and wiring due to the design allows application equipment to be reduced in dimensions and weight.**



● **Power Module Classification**

CM	Intelligent Power Module (C : Customize)
GM	IGBT Module
FM	MOSFET Module
DM	Diode Module
TM	Thyristor Module



● Power Module Ordering

GM 100 DX 06 A XX

- ◆ Feature
- F : Fast switching type
 - L : Low Vce(sat)
 - T : Trench IGBT
 - N : NTC
 - Version up : 1.2.3....n

- ◆ Voltage Class X 100

- ◆ Internal Circuit
- S : Single (switch with on IGBT, Diode)
 - SH: Single (switch with on IGBT, Diode) / Buck chopper
 - SL : Single (switch with on IGBT, Diode) / Boost chopper
 - HB : half – bridge
 - FB : Full –bridge
 - TB: 3 Phase Full-bridge (6 IGBTs and Diodes)
 - DT : Dual (switch with on IGBT, Diode) with 3 others
 - DD : Dual (switch with on IGBT, Diode) with 2 others
 - RT : 3 Phase Rectifire diode
 - RD : single phase Rectifire diode
 - C : Brake Chopper

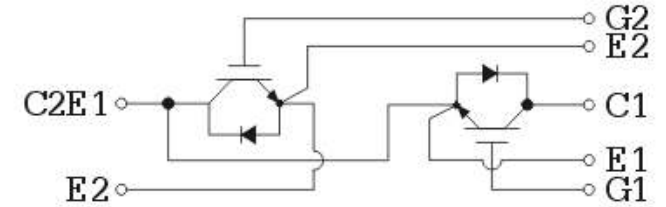
- ◆ Package Style (unit : width of package size)
- A : 1 pack package
 - B : 2 pack package (34mm)
 - C : 2 pack package (62mm)
 - D : 4 pack package
 - E : 6/7 pack package (40mm under)
 - F : 6 pack package (40mm over)
 - G : TO – 240AA Package
 - H : DIP Type (Special) Package

- ◆ Rated Current

- ◆ Power Module Classification
- CM : Intelligent Power Module (C : Customize)
 - GM : IGBT Module
 - FM : MOSFET Module
 - DM : Diode Module
 - TM : Thyristor Module

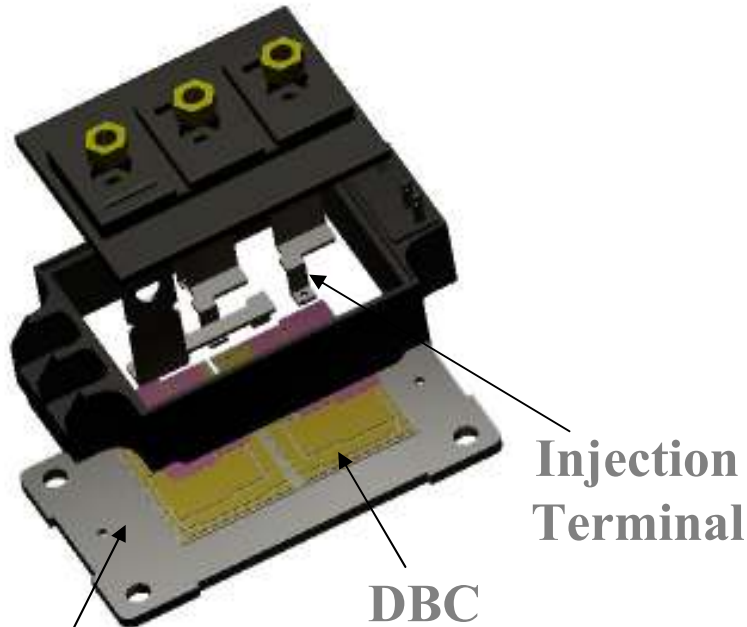
● **Feature**

- A. IGBT New Technology (Trench-NPT)**
- B. Low $V_{CE(sat)}$**
- C. Low Turn-off losses**
- D. Short tail current**
- E. Positive temperature coefficient**



IGBT 2 PACK	600V				1200V			
	GMB01	75A	100A	150A	200A	75A	100A	-
GMB02	300A	400A	-	-	150A	200A	300A	-

	Width of package	Main Terminal
GMB01	34mm	13mm (M5)
GMB02	62mm	13mm (M6)



Base Plate Design of little resistance

Innovation Design



GMB 01



GMB 02

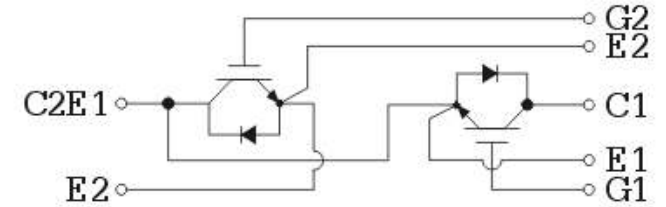


Part Name	V _{CES}	I _C @ T _C		V _{CE(ON)}	I _{Cp}	IGBT Type	Package
	V	A @25°C	A @ 80°C	V	A		
GM75HB6BT	600	100	75	1.5	140	Trench	GMB 01
GM100HB06BT	600	130	100	1.5	200	Trench	GMB 01
GM150HB06BT	600	210	150	1.5	350	Trench	GMB 01
GM200HB06BT	600	260	200	1.5	400	Trench	GMB 01
GM300HB06CT	600	360	300	1.5	600	Trench	GMB 02
GM400HB06CT	600	450	400	1.5	800	Trench	GMB 02
GM75HB12BT	1200	100	75	1.7	140	Trench	GMB 01
GM100HB12BT	1200	130	100	1.7	200	Trench	GMB 01
GM150HB12CT	1200	200	150	1.7	350	Trench	GMB 02
GM200HB12CT	1200	260	200	1.7	400	Trench	GMB 02
GM300HB12CT	1200	360	300	1.7	600	Trench	GMB 02



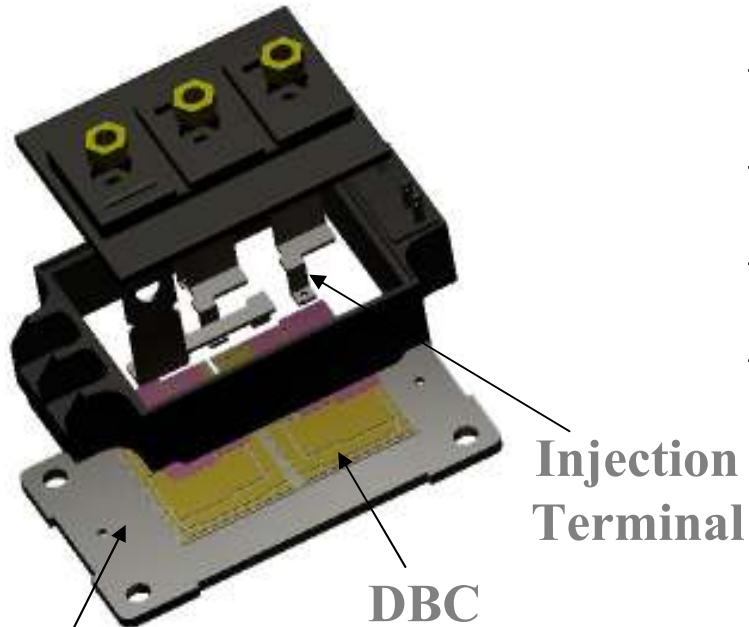
● **Feature**

- A. IGBT NPT Technology**
- B. Low $V_{CE(sat)}$**
- C. Low Turn-off losses**
- D. Short tail current**
- E. Positive temperature coefficient**



IGBT 2 PACK	600V				1200V			
	75A	100A	-	-	75A	100A	-	-
GMB01	75A	100A	-	-	75A	100A	-	-
GMB02	300A	400A	-	-	150A	200A	300A	-

	Width of package	Main Terminal
GMB01	34mm	13mm (M5)
GMB02	62mm	13mm (M6)



Base Plate Design of little resistance

Innovation Design



GMB 01



GMB 02



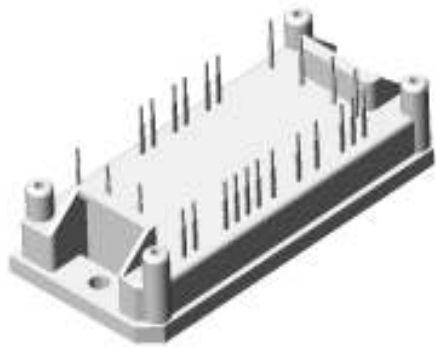
Part Name	V _{CES}	I _c @ T _c		V _{CE(ON)}	I _{Cp}	IGBT Type	Package
	V	A @25°C	A @ 80°C	V	A		
GM75HB6BTL	600	100	75	1.9	140	NPT	GMB 01
GM100HB06BL	600	130	100	1.9	200	NPT	GMB 01

Under-develop

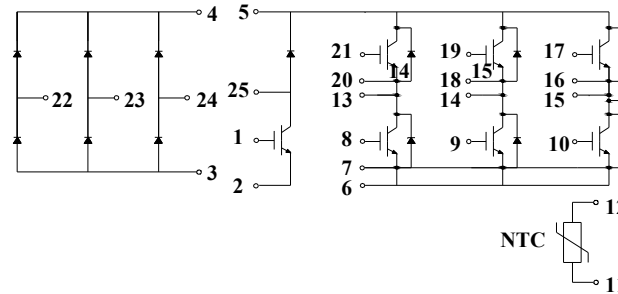
● **Feature**

- A. IGBT New Technology (Trench-NPT)**
- B. Low $V_{CE(sat)}$**
- C. Low Turn-off losses**
- D. Short tail current**
- E. Positive temperature coefficient**
- F. Protection Function (built in NTC)**
- G. Directly Base Plate**

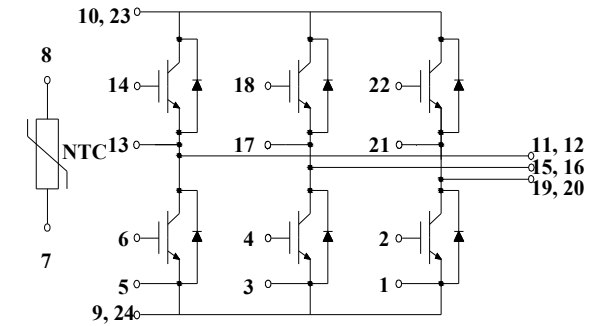
IGBT 6 / 7 PACK	600V			1200V		
GMB 03	10A	15A	30A	10A	15A	30A



GMB 03



Converter – Inverter - Brake



Inverter



Part Name		Rectifier		Inverter				Brake Chopper		NTC	Package
		V_{RRM}	I_{FAV} Tc=80 °C	V_{CES}	I_c Tc=80 °C	$V_{CE(sat)}$ Typ	I_F Tc=80 °C	V_{CES}	I_c Tc=80 °C		
		V	A	V	A	V	A	V	A		
Six Pack		-	-	600	10	1.9	10	-	-	○	GMB 03
		-	-	600	15	2.1	15	-	-	○	GMB 03
		-	-	600	30	2.1	30	-	-	○	GMB 03
		-	-	600	40	1.95	50	-	-	○	GMB 03
Seven Pack		1600	29	600	10	1.9	10	600	8	○	GMB 03
		1600	29	600	15	2.1	15	600	9.6	○	GMB 03
		1600	29	600	20	2.1	20	600	12	○	GMB 03
		1600	37	600	30	2.1	30	600	16	○	GMB 03
		1600	37	1200	10	2.4	10	1200	12	○	GMB 03
		1600	37	1200	15	2.4	15	1200	12	○	GMB 03

Under-develop



75V / 480A MOSFET Module for Golf Car

FEATURE

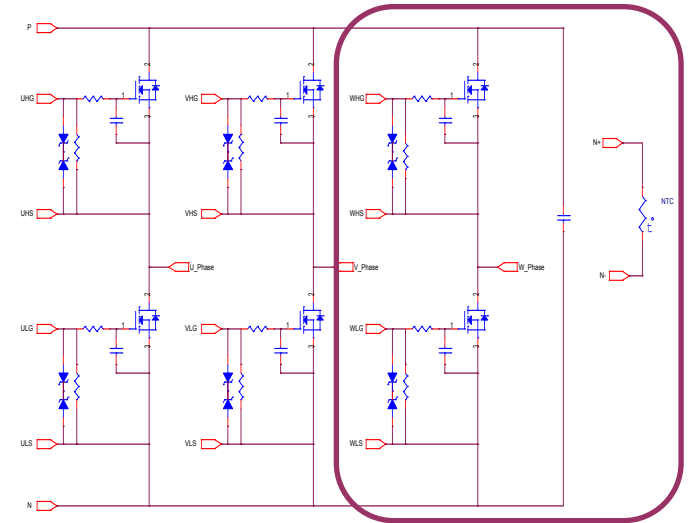
- Automotive MOSFET
- Ultra Low on Resistance
- Fast Switching
- Lead Free

APPLICATION

- AC & DC Motor controls for Electric Vehicle



<Custom Package>



CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-to-Source Breakdown Voltage		V_{DSS}	75	V
Gate Threshold Voltage		V_{th}	—	V
Continuous Drain Current	@ $T_c=25^{\circ}C$	I_c	836	A
	@ $T_c=125^{\circ}C$		480	
Isolation Voltage Test	AC @ 1minute	V_{iso}	2500	V
Junction Temperature		T_j	-40~+175	$^{\circ}C$
Storage Temperature		T_{stg}	-40~+150	$^{\circ}C$
Weight of Module		Weight	98	G
Terminal Connection Torque		M_d	10	N.m



100V / 480A MOSFET Module for Golf Car

FEATURE

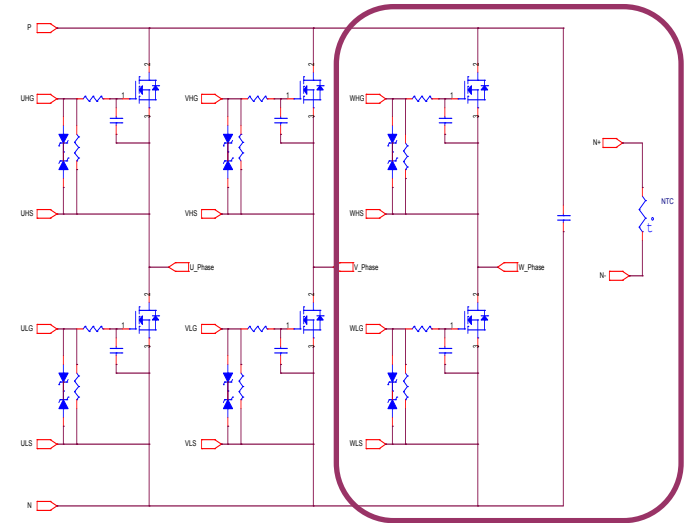
- Automotive MOSFET
- Ultra Low on Resistance
- Fast Switching
- Lead Free

APPLICATION

- AC & DC Motor controls for Electric Vehicle



<Custom Package>



CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-to-Source Breakdown Voltage		V_{DSS}	100	V
Gate Threshold Voltage		V_{th}	—	V
Continuous Drain Current	@ $T_c=25^{\circ}C$	I_c	870	A
	@ $T_c=125^{\circ}C$		480	
Isolation Voltage Test	AC @ 1minute	V_{iso}	2500	V
Junction Temperature		T_j	-40~+175	$^{\circ}C$
Storage Temperature		T_{stg}	-40~+150	$^{\circ}C$
Weight of Module		Weight	98	G
Terminal Connection Torque		M_d	10	N.m



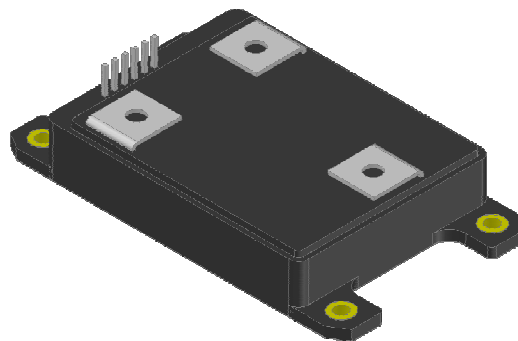
100V / 480A MOSFET Module for Golf Car

FEATURE

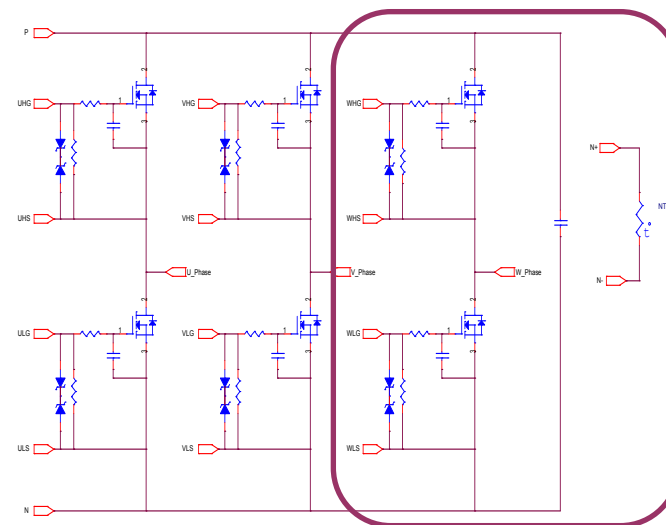
- Automotive MOSFET
- Ultra Low on Resistance
- Fast Switching
- Lead Free

APPLICATION

- AC & DC Motor controls for Electric Vehicle



<Custom Package>



CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-to-Source Breakdown Voltage		V _{DSS}	100	V
Gate Threshold Voltage		V _{th}	—	V
Continuous Drain Current	@ Tc=25°C	I _c	580	A
	@ Tc=125°C		450	
Isolation Voltage Test	AC @ 1minute	V _{iso}	3000	V
Junction Temperature		T _j	-40~+175	°C
Storage Temperature		T _{stg}	-40~+150	°C
Weight of Module		Weight	60	G
Terminal Connection Torque		Md	10	N.m



200V / 200A Diode Module for LDC in HEV

FEATURE

- Ultrafast Recovery Times
- Soft Recovery Characteristics
- Low Forward Voltage
- Low Leakage Current
- Low Losses, Cooler Operation
- Higher Reliability Systems
- Easy to use
- Optical Isolated
- Pb Free Package

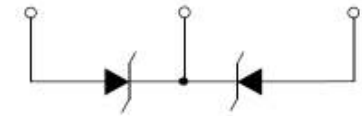
APPLICATION

- Rectifiers In Switching Mode (HEV)



<Custom Package>

TENTATIVE



**Anode-common
Schottky Diode**

CHARACTERISTIC		SYMBOL	RATING	UNIT
MAXIMUM RATINGS				
Maximum D.C. Reverse Voltage		V_R	200	V
Maximum Peak Repetitive Reverse Voltage		V_{RRM}		
Maximum Average Forward Current	$T_c = 125^{\circ}\text{C}$	$I_{F(AV)}$	200	A
Operating and Storage Temperature Range		T_{stg}	-55 to 150	$^{\circ}\text{C}$
STATIC ELECTRICAL CHARACTERISTICS				
Forward Voltage	$T_c = 125^{\circ}\text{C}$	V_F	0.9	V
Maximum Reverse Leakage Current	$T_c = 125^{\circ}\text{C}$	I_{RM}	40	mA
THERMAL AND MECHANICAL CHARACTERISTICS				
Junction to case Thermal Resistance		$R_{(JC)}$	MIN 0.65	$^{\circ}\text{C} / \text{W}$
RMS Voltage (Terminals to Package Base for 1MIN)		Viso	MIN 2.5	KV
Maximum Terminal & Mounting Torque		Md	2.0	N.m

