

### Electrical Features

- Trench/Fieldstop IGBT
- Low  $V_{CE(sat)}$
- $V_{CE(sat)}$  with positive temperature coefficient
- 10  $\mu$  s short circuit capability
- Fast&soft reverse recovery anti-parallel FWD
- Low inductance case



### Typical Applications

- Motor Drives
- High Power Converters
- UPS System
- Servo Drives
- Wind Turbines

### IGBT, Inverter

Maximum Rated Values							
Symbol	Item	Conditions	Rating			Unit	
IGBT							
$V_{CES}$	Collector-emitter voltage	$T_{vj}=25^{\circ}C$	1700			V	
$V_{GES}$	Gate-emitter voltage	-	$\pm 20$			V	
$I_C$	Collector current,DC	$T_C=100^{\circ}C, T_{vj}=175^{\circ}C$	450			A	
$I_{CRM}$	Repetitive peak collector current	$t_p=1ms$	900			A	
$t_{SC}$	Short circuit withstand time	$V_{GE}=15V, V_{CC}=800V, T_{vj}\leq 150^{\circ}C$	10			$\mu s$	
$P_{tot}$	Total power dissipation	$T_C=25^{\circ}C, T_{vj}=175^{\circ}C$	2500			W	
Characteristics Values							
Symbol	Item	Conditions	Values			Unit	
			Min.	Typ.	Max.		
IGBT							
$I_{CES}$	Collector-emitter cut-off current	$V_{CE}=1700V, V_{GE}=0V, T_{vj}=25^{\circ}C$	-	-	3	mA	
$I_{GES}$	Gate leakage current	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$	-	-	400	nA	
$V_{GE(th)}$	Gate-emitter threshold voltage	$I_C=12mA, V_{CE}=V_{GE}, T_{vj}=25^{\circ}C$	5.0	6.0	7.0	V	
$V_{CEsat}$	Collector-emitter saturation voltage	$I_C=450A$	$T_{vj}=25^{\circ}C$	-	2.4		-
		$V_{GE}=15V$	$T_{vj}=125^{\circ}C$	-	-		-
			$T_{vj}=150^{\circ}C$	-	-	-	
$C_{ies}$	Input capacitance	$V_{CE}=25V, V_{GE}=0V$ $f=1MHz, T_{vj}=25^{\circ}C$	-	43.8	-	nF	
$C_{oes}$	Output capacitance		-	1.47	-		
$C_{res}$	Reverse transfer capacitance		-	1.32	-		
$Q_G$	Gate charge	$V_{CC}=800V, I_C=450A, V_{GE}=15V$	-	5.1	-	$\mu C$	
$R_g$	Internal gate resistance	$T_{vj}=25^{\circ}C$	-	1.7	-	$\Omega$	

$t_{d(on)}$	Turn-on delay time	$V_{CC}=900V,$ $I_C=450A,$ $V_{GE}=\pm 15V,$ $R_{G(on)}=2.4\ \Omega,$ $R_{G(off)}=2.4\ \Omega,$ Inductive load	$T_{vj}=25^\circ C$	-	406	-	ns
			$T_{vj}=125^\circ C$	-	-	-	
			$T_{vj}=150^\circ C$	-	-	-	
$t_r$	Rise time		$T_{vj}=25^\circ C$	-	216	-	
			$T_{vj}=125^\circ C$	-	-	-	
			$T_{vj}=150^\circ C$	-	-	-	
$t_{d(off)}$	Turn-off delay time		$T_{vj}=25^\circ C$	-	579	-	
			$T_{vj}=125^\circ C$	-	-	-	
			$T_{vj}=150^\circ C$	-	-	-	
$t_f$	Fall time		$T_{vj}=25^\circ C$	-	361	-	
			$T_{vj}=125^\circ C$	-	-	-	
			$T_{vj}=150^\circ C$	-	-	-	
$E_{on}$	Turn-on energy (per pulse)	$T_{vj}=25^\circ C$	-	159.7	-	mJ	
		$T_{vj}=125^\circ C$	-	-	-		
		$T_{vj}=150^\circ C$	-	-	-		
$E_{off}$	Turn-off energy (per pulse)	$T_{vj}=25^\circ C$	-	94.0	-		
		$T_{vj}=125^\circ C$	-	-	-		
		$T_{vj}=150^\circ C$	-	-	-		
$R_{thJC}$	Thermal resistance, junction to case	per IGBT	-	-	0.06	K/W	
$R_{thCH}$	Thermal resistance, case to heatsink	per IGBT/ $\lambda_{grease}=1W/(m \cdot K)$	-	0.029	-	K/W	
$T_{vjop}$	Temperature under switching conditions		-40		150	$^\circ C$	

**Diode, Inverter**
**Maximum Rated Values**

Symbol	Item	Conditions	Rating	Unit
$V_{RRM}$	Repetitive peak reverse voltage	$T_{vj}=25^\circ C$	1700	V
$I_F$	Forward current, DC		450	A
$I_{FRM}$	Repetitive peak forward current	$t_p=1ms$	900	A

**Characteristic Values**

$V_F$	Continuous forward voltage	$I_F=450A$ $V_{GE}=0V$	$T_{vj}=25^\circ C$	-	2.23	-	V	
			$T_{vj}=125^\circ C$	-	-	-		
			$T_{vj}=150^\circ C$	-	-	-		
$I_{RM}$	Peak reverse recovery current		$T_{vj}=25^\circ C$	-	191.5	-	A	
			$T_{vj}=125^\circ C$	-	-	-		
			$T_{vj}=150^\circ C$	-	-	-		
$t_{rr}$	Reverse recovery time		$V_R=900V$ $I_F=450A$ $V_{GE}=-15V$	$T_{vj}=25^\circ C$	-	677	-	ns
				$T_{vj}=125^\circ C$	-	-	-	
				$T_{vj}=150^\circ C$	-	-	-	
$Q_r$	Recovered charge			$T_{vj}=25^\circ C$	-	52	-	$\mu C$
				$T_{vj}=125^\circ C$	-	-	-	
				$T_{vj}=150^\circ C$	-	-	-	
$E_{rec}$	Reverse recovered energy	$T_{vj}=25^\circ C$		-	25.5	-	mJ	
		$T_{vj}=125^\circ C$		-	-	-		
		$T_{vj}=150^\circ C$		-	-	-		

$R_{thJC}$	Thermal resistance, junction to case	per diode	-	-	0.1	K/W
$R_{thCH}$	Thermal resistance, case to heatsink	per diode/ $\lambda_{grease}=1W/(m \cdot K)$	-	0.05	-	K/W
$T_{vjop}$	Temperature under switching conditions		-40		150	°C

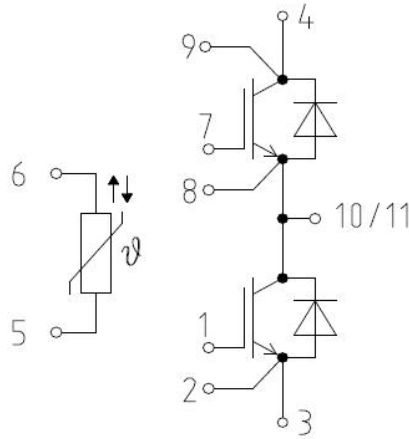
### Module

Symbol	Item	Conditions	Rating			Unit
$V_{ISOL}$	Isolation voltage	Terminals to baseplate, RMS, $f=50Hz, t=1min$	2500			V
-	Material of module baseplate	-	Cu			-
-	Internal isolation	Basic insulation(class 1, IEC 61140)	Al <sub>2</sub> O <sub>3</sub>			-
$T_{stg}$	Storage temperature	-	-40~125			°C
Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
M	Mounting torque for module mounting	Screw M6	3.0	-	5.0	Nm
	Terminal connection torque	Screw M6	2.5	-	5.0	Nm
ds	Creepage distance	Terminal to terminal	-	13	-	mm
		Terminal to base plate	-	14.5	-	
da	Clearance	Terminal to terminal	-	10	-	mm
		Terminal to base plate	-	12.5	-	
m	Weight	-	-	340	-	g

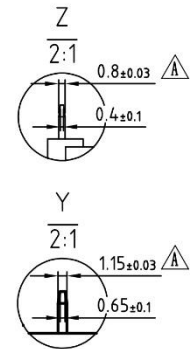
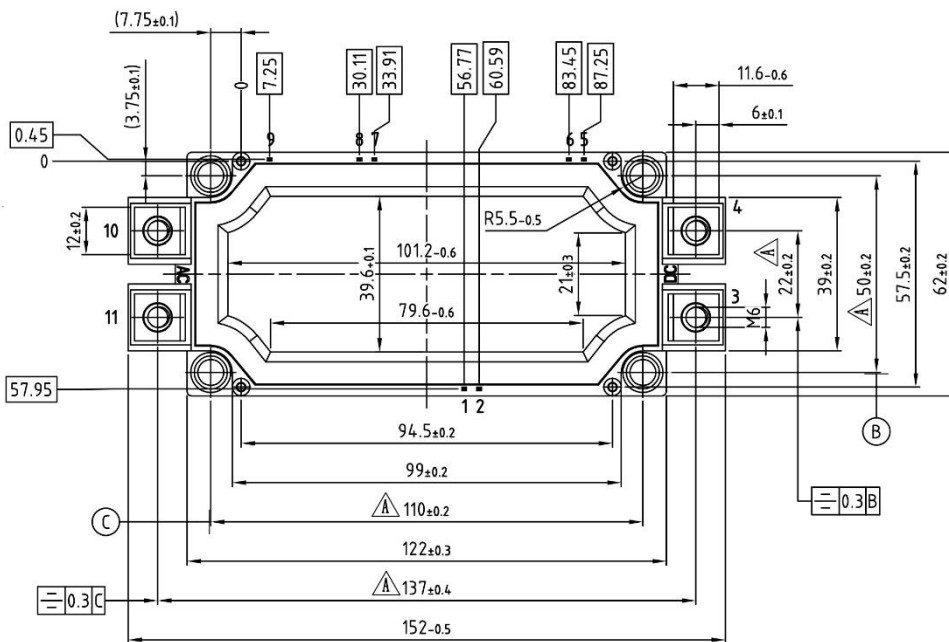
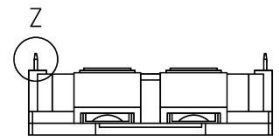
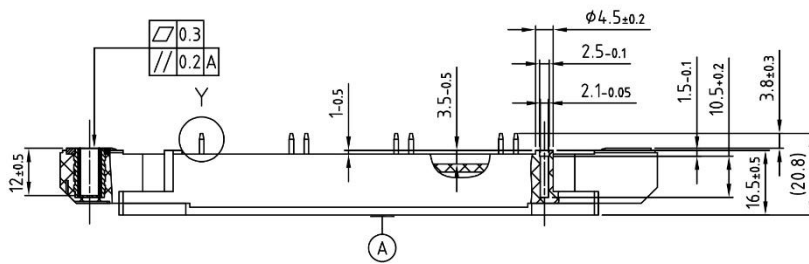
### NTC Thermistor Characteristics

Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
$R_{25}$	Rated resistance	$T_C=25^{\circ}C$	-	5	-	kΩ
$\Delta R/R$	Deviation of resistance	$T_C=100^{\circ}C, R_{100}=493\Omega$	-5	-	5	%
$P_{25}$	Power dissipation	$T_C=25^{\circ}C$	-	-	20	mW
$B_{25/50}$	B-constant	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$	-	3375	-	K
$B_{25/80}$	B-constant	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$	-	3411	-	
$B_{25/100}$	B-constant	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298.15K))]$	-	3433	-	

Circuit diagram headline



Package outlines (Unit: mm)



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