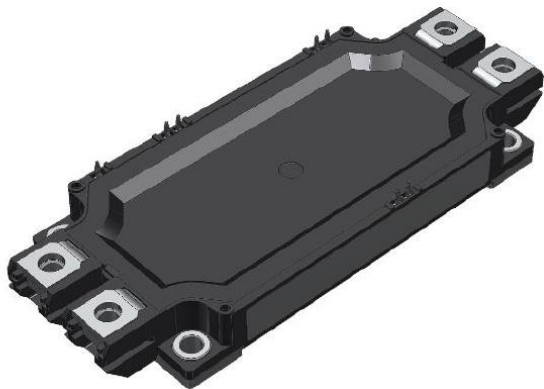




Key Parameters

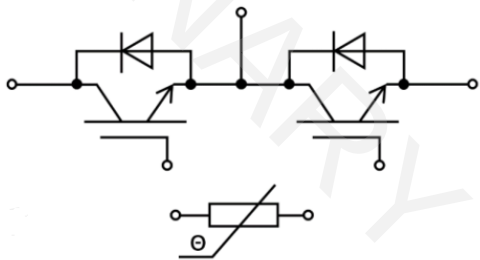
V_{CE}	= 1200V
I_C	= 900A

Features

- 1200V Trench Gate & Field Stop Structure
- Integrated Temperature Sensor
- V_{CEsat} with Positive Temperature Coefficient
- Low Thermal Resistance Package
- High Power Density
- Isolated Base Plate

Applications

- Inverter for motor drive
- AC and DC servo drive amplifier
- UPS
- Soft switching welding machine



Equivalent Circuit Schematic

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Absolute Maximum Ratings						
Symbol	Characteristic	Value	Unit			
V _{CES}	Collector-Emitter Voltage	1200	V			
I _{CDC}	Continuous DC Collector Current (T _c =100°C, T _j =175°C)	900	A			
I _{CRM}	Peak Collector Current (tp=1ms)	1800	A			
V _{GES}	Gate-Emitter Voltage	±20	V			
P _{tot}	Total Power Dissipation (T _c =25°C, T _j =175°C)	4500	W			
IGBT Characteristics						
Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
I _{CES}	Collector-Emitter leakage Current	V _{CE} =1200V, V _{GE} =0V, T _{vj} =25°C			1.0	mA
I _{GES}	Gate-Emitter leakage Current	V _{CE} =0V, V _{GE} =±20V, T _{vj} =25°C	-100		100	nA
V _{GE(th)}	Gate-emitter Threshold Voltage	V _{GE} =V _{CE} , I _C =36mA, T _{vj} =25°C		5.6		V
V _{CE(sat)}	Collector-Emitter Saturation Voltage	I _C =900A, V _{GE} =15V, T _{vj} =25°C		1.80		V
		I _C =900A, V _{GE} =15V, T _{vj} =125°C		2.10		
		I _C =900A, V _{GE} =15V, T _{vj} =175°C		2.25		V
Q _G	Gate Charge	V _{GE} =±15V, T _{vj} =25°C		7.0		μC
R _{gint}	Internal Gate Resistance			1.0		Ω
C _{ies}	Input Capacitance	V _{CE} =25V, V _{GE} =0V,		115		nF
C _{res}	Reverse Transfer Capacitance	f=100KHz, T _{vj} =25°C		1.0		nF
t _{d(on)}	Turn-on Delay Time	I _C =900 A		245		ns
t _r	Rise Time	V _{CE} = 600 V		80		ns
t _{d(off)}	Turn-off Delay Time	V _{GE} = ±15V		400		ns
t _f	Fall Time	R _{Gon} = 0.5Ω		190		ns
E _{on}	Energy Dissipation During Turn-on Time	R _{Goff} = 0.5Ω		75		mJ
E _{off}	Energy Dissipation During Turn-off Time	T _{vj} =25°C , Inductive load		80		mJ
t _{d(on)}	Turn-on Delay Time	I _C =900 A V _{CE} = 600 V V _{GE} = ±15V R _{Gon} = 0.5Ω R _{Goff} = 0.5Ω T _{vj} =125°C , Inductive load		265		ns
t _r	Rise Time			90		ns
t _{d(off)}	Turn-off Delay Time			440		ns
t _f	Fall Time			280		ns
E _{on}	Energy Dissipation During Turn-on Time			110		mJ
E _{off}	Energy Dissipation During Turn-off Time			90		mJ
t _{d(on)}	Turn-on Delay Time	I _C =900 A V _{CE} = 600 V V _{GE} = ±15V R _{Gon} = 0.5Ω R _{Goff} = 0.5Ω T _{vj} =175°C , Inductive load		275		ns
t _r	Rise Time			115		ns
t _{d(off)}	Turn-off Delay Time			470		ns
t _f	Fall Time			355		ns
E _{on}	Energy Dissipation During Turn-on Time			145		mJ
E _{off}	Energy Dissipation During Turn-off Time			105		mJ
I _{SC}	SC Data	t _{sc} ≤8μs, V _{GE} =15V, T _{vj} =150°C, V _{cc} ≤800V		3300		A
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Diode Characteristics

Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
I_F	Diode DC Forward Current			900		A
I_{FRM}	Diode Peak Forward Current	$t_p=1ms$		1800		A
V_F	Forward Voltage	$I_F=900A, T_{vj}=25^{\circ}C$		2.10		V
		$I_F=900A, T_{vj}=125^{\circ}C$		2.25		V
		$I_F=900A, T_{vj}=175^{\circ}C$		2.25		V
Q_{rr}	Recovered Charge	$I_F=900A$		85		μC
I_{rr}	Peak Reverse Recovery Current	$V_R=600V$		610		A
E_{rec}	Reverse Recovery Energy	$-di_F/dt=6250A/\mu s, T_{vj}=25^{\circ}C$		25		mJ
Q_{rr}	Recovered Charge	$I_F=900A$		115		μC
I_{rr}	Peak Reverse Recovery Current	$V_R=600V$		535		A
E_{rec}	Reverse Recovery Energy	$-di_F/dt=6250A/\mu s, T_{vj}=125^{\circ}C$		50		mJ
Q_{rr}	Recovered Charge	$I_F=900A$		150		μC
I_{rr}	Peak Reverse Recovery Current	$V_R=600V$		530		A
E_{rec}	Reverse Recovery Energy	$-di_F/dt=6250A/\mu s, T_{vj}=175^{\circ}C$		60		mJ

Module Characteristics

Symbol	Characteristic	Conditions	Value			Unit
			Min.	Typ.	Max.	
V_{isol}	Isolation voltage	$t=1min, f=50Hz$	3400			V
T_{jmax}	Maximum Junction Temperature				175	$^{\circ}C$
$T_{vj op}$	Operating Junction Temperature		-40		175	$^{\circ}C$
T_{stg}	Storage Temperature		-40		125	$^{\circ}C$
$R_{CC'+EE'}$	Module lead resistance terminal to chip			1.1		m Ω
L_{SCE}	Stray Inductance, Module			20		nH
$R_{\theta jc}$	Junction-to Case	per IGBT-inverter		0.033		$^{\circ}C/W$
		per Diode-inverter		0.051		$^{\circ}C/W$
$R_{\theta cs}$	Case to Sink	per IGBT-inverter		0.029		$^{\circ}C/W$
		per Diode-inverter		0.036		$^{\circ}C/W$
M_t	Module Electrodes Torque	Recommended(M6)	3.0		6.0	N·m
M_s	Module-to-Sink Torque	Recommended(M5)	3.0		6.0	N·m
G	Weight of Module			348		g

NTC thermistors Characteristics

Symbol	Characteristic	Conditions	Min.	Typ.	Max.	Unit
R_{25}	Rated resistance			5.0		k Ω
P_{25}	Power Dissipation				10.0	mW
$B_{25/50}$	B-value	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298.15K))]$		3375		K
$B_{25/80}$	B-value	$R_2=R_{25}\exp[B_{25/80}(1/T_2-1/(298.15K))]$		3414		K
$B_{25/100}$	B-value	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298.15K))]$		3436		K

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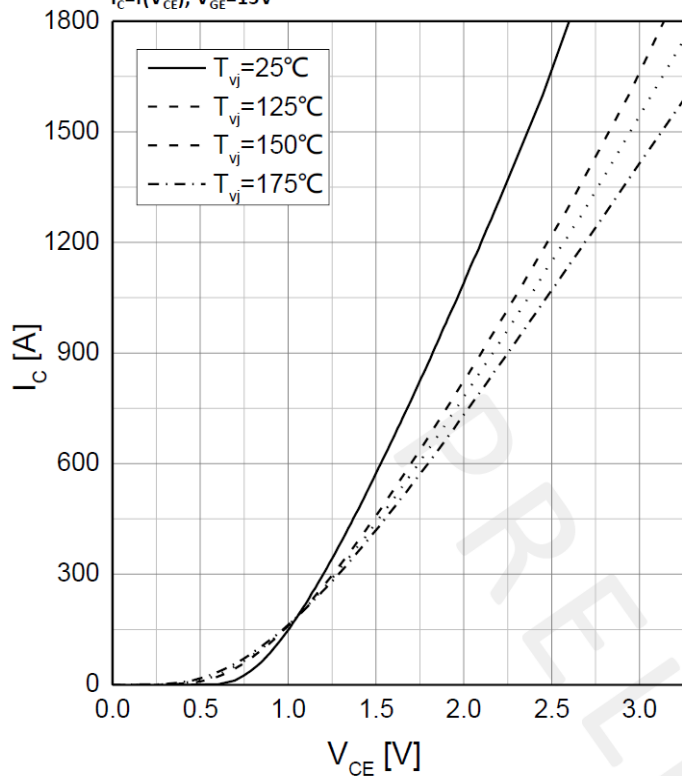
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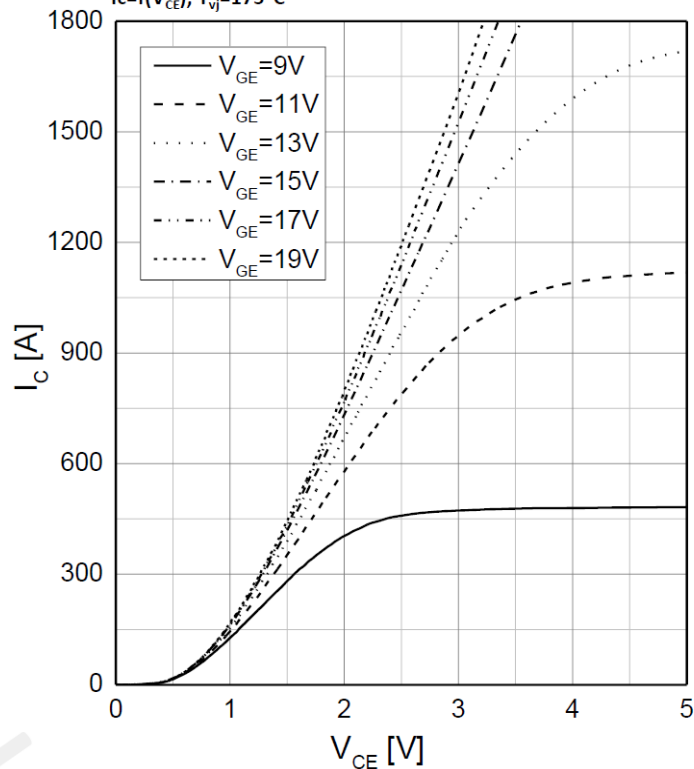
Output Characteristic IGBT

$I_c = f(V_{CE}), V_{GE} = 15V$



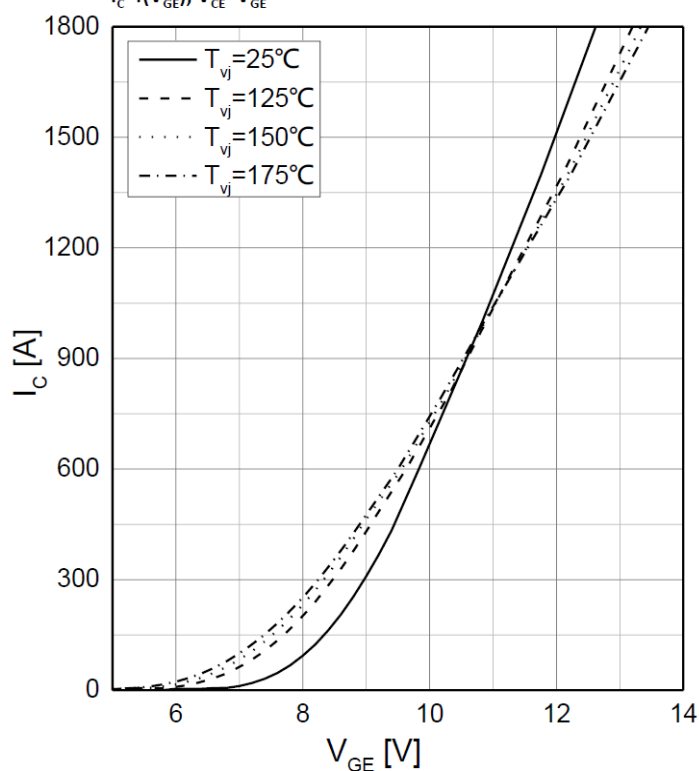
Output Characteristic IGBT

$I_c = f(V_{CE}), T_{vj} = 175^\circ C$



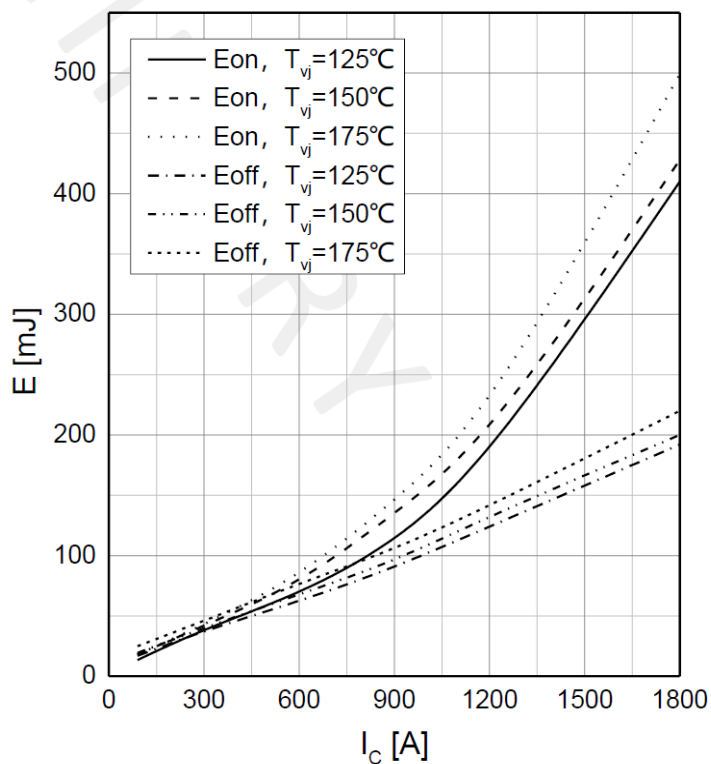
Transfer Characteristic IGBT

$I_c = f(V_{GE}), V_{CE} = V_{GE}$



Switching Losses IGBT

$E = f(I_c), V_{GE} = \pm 15V, R_{Gon} = R_{Goff} = 0.5\Omega, V_{CE} = 600V$



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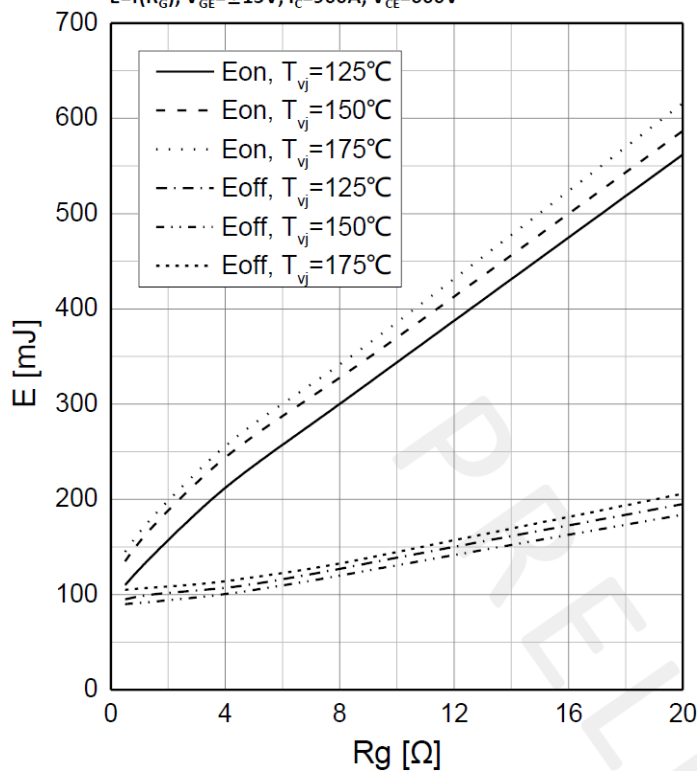
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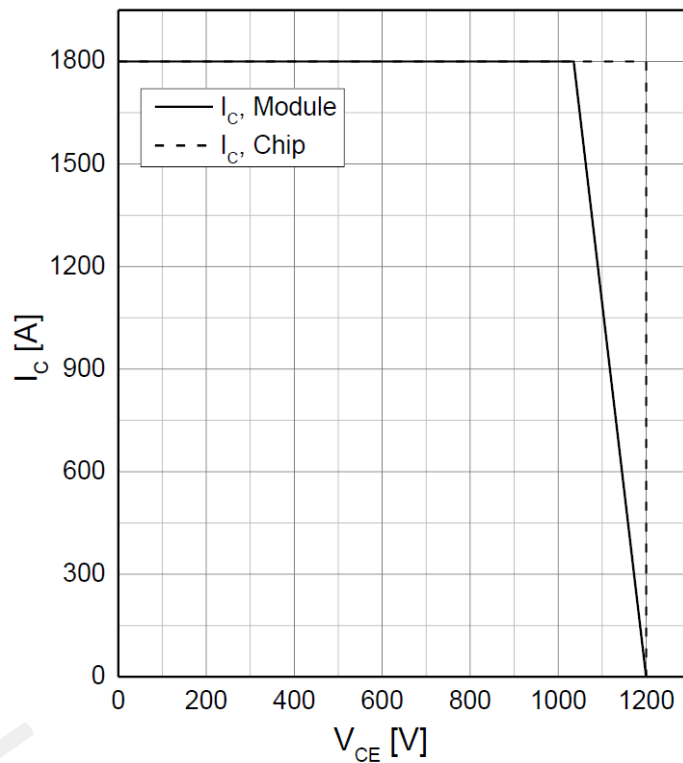
Switching Losses IGBT

$E = f(R_g), V_{GE} = \pm 15V, I_C = 900A, V_{CE} = 600V$



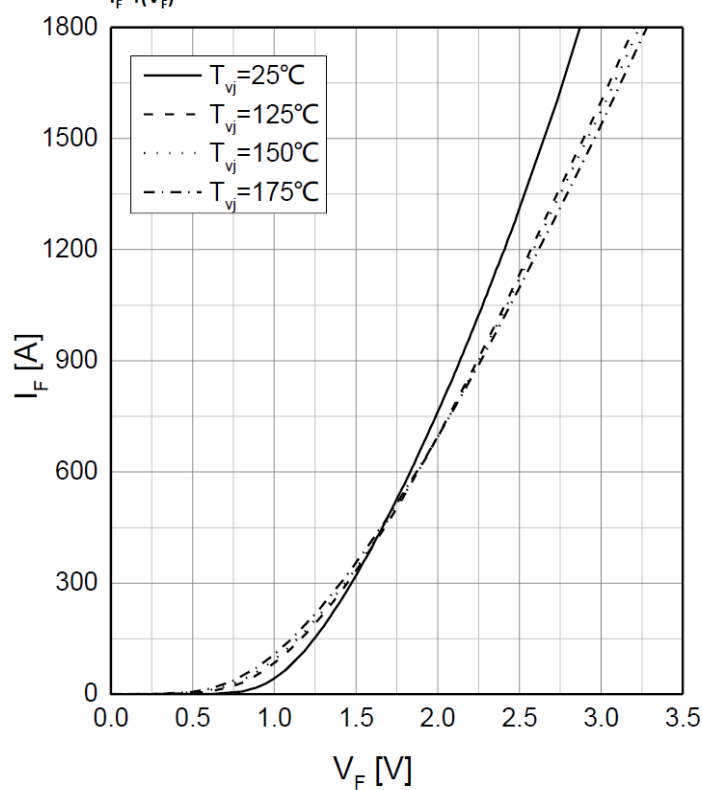
Reverse Bias Safe Operating Area IGBT

$V_{GE} = \pm 15V, R_{Goff} = 0.5\Omega, T_{vj} = 175^\circ C$



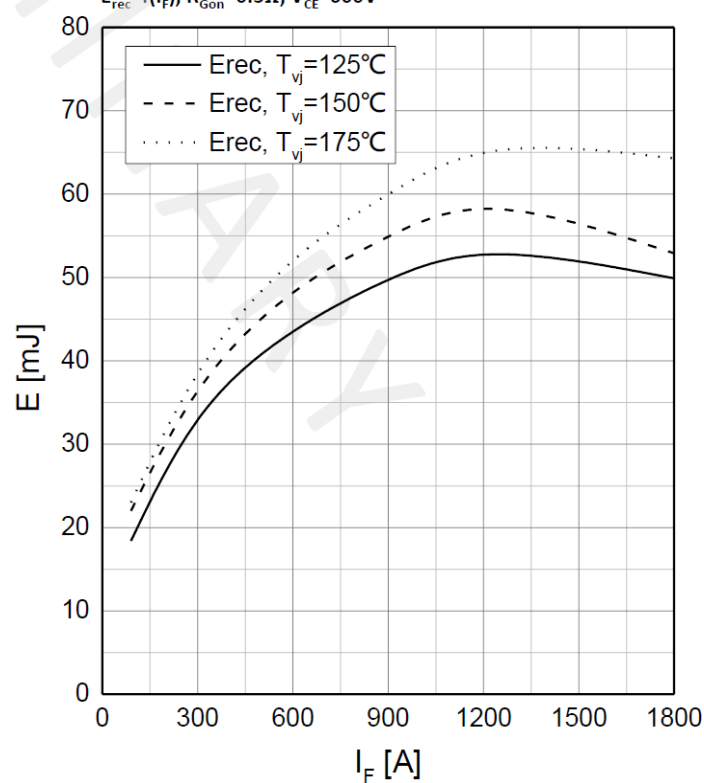
Forward Characteristic FRD

$I_F = f(V_F)$



Switching Losses Diode

$E_{rec} = f(I_F), R_{Gon} = 0.5\Omega, V_{CE} = 600V$

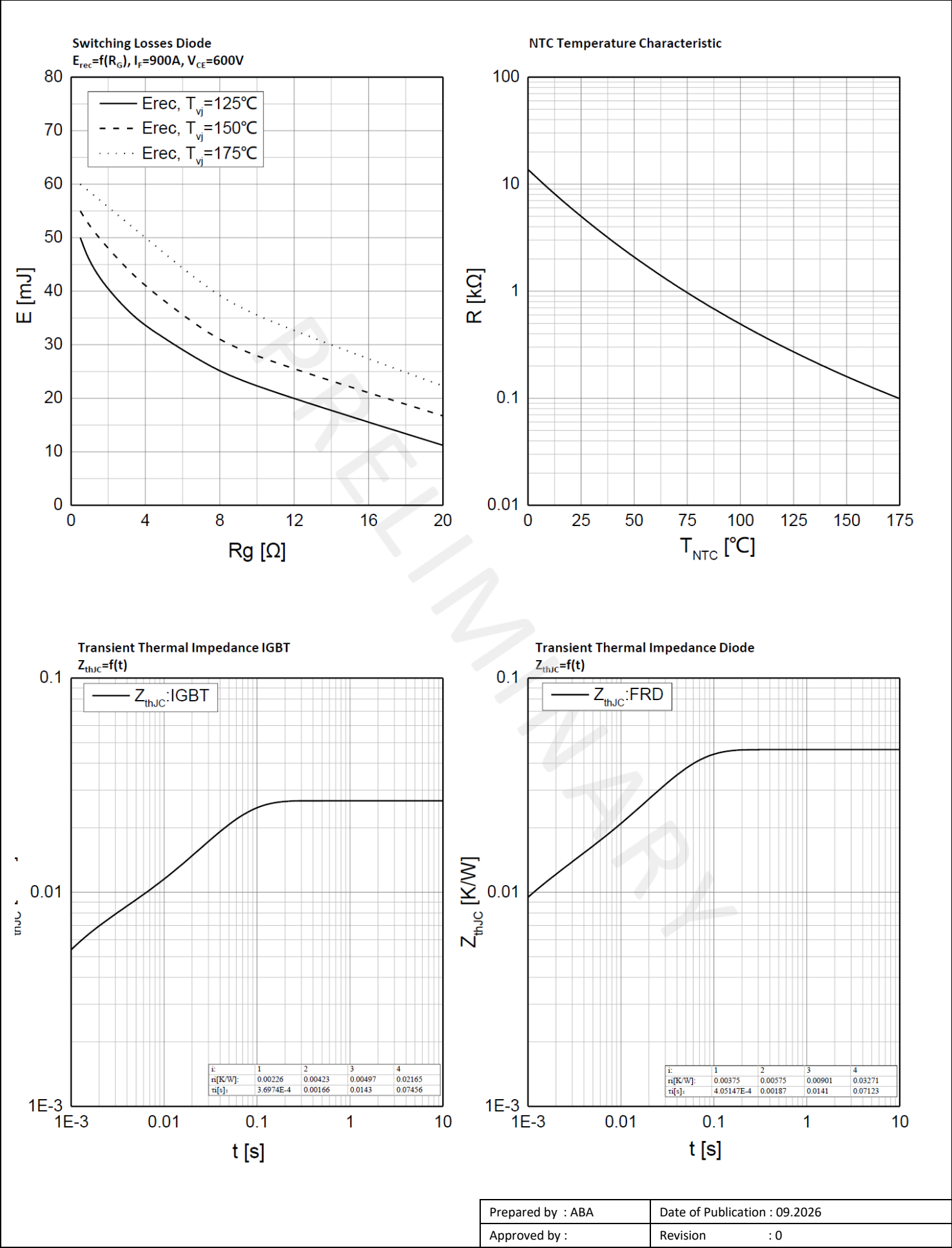


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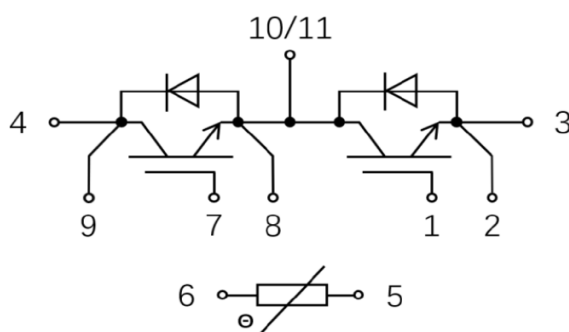
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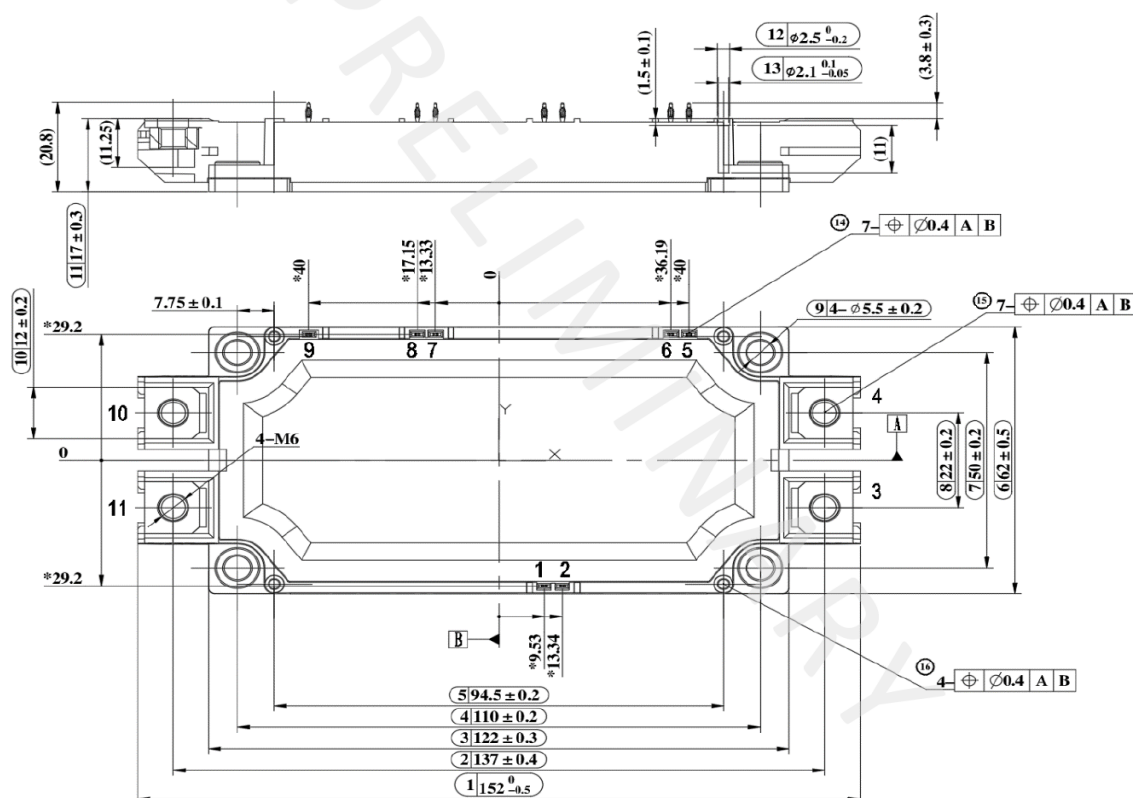


Outline:

Circuit Diagram



Outline Drawing



MS Power GmbH

Mergenthalerallee 79-81
65760 Eschborn, Germany
Web: www.msppowergroup.com
Mail: info@msppowergroup.de

Sales & Enquiry:

sales@mspowergroup.de

Technical Support:

solution@mspowergroup.de

After sales Service:

service@mspowergroup.de

Phone: +49 (0) 6196/7768 666

Fax: +49 (0) 6196/7757 888



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