

Econo Dual module with Trench/Fieldstop IGBT and Fast recovery diode and NTC

Features

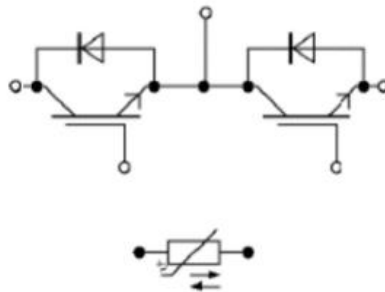
- 1200V 600A, $V_{CE(sat)} (typ.)=1.70V$
- Trench & Field Stop IGBT
- Short Circuit Rated >10us
- Low Switching Loss



Applications

- Hybrid Electrical Vehicles(H)EV
- Automotive Applications
- Commercial Agriculture Vehicles

Equivalent Circuit Schematic



IGBT - Inverter

Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
V_{CES}	Collector-Emitter Voltage	$T_{vj}=25^{\circ}C$	1200	V
V_{GES}	Gate-Emitter Peak Voltage	$T_{vj}=25^{\circ}C$	± 20	V
I_C	Continuous DC Collector Current	$T_C=100^{\circ}C$	600	A
I_{CRM}	Repetitive Peak Collector Current	$t_p=1ms$	1200	A
t_{SC}	Short Circuit Withstand Time		>10	us
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vjmax}=175^{\circ}C$	3950	W

Characteristic Values

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=600A, T_{vj}=25^{\circ}C$	---	1.7	1.95	V
		$V_{GE}=15V, I_C=600A, T_{vj}=125^{\circ}C$	---	1.9	--	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=10.0mA$	5.0	5.5	6.8	V
I_{CES}	Collector-Emitter Cut-Off Current	$V_{CE}=1200V, V_{GE}=0V$	---	---	1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=30V, V_{CE}=0V$	---	---	800	nA
C_{ies}	Input Capacitance	$V_{CE}=25V$ $V_{GE}=0V$ $f=1MHz$	---	49.26	---	nF
C_{oes}	Output Capacitance		---	3.67	---	nF
C_{res}	Reverse Capacitance		---	1.85	---	nF
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=\pm 15V$ $I_C=600A$ $R_G=1\Omega$ Inductive Load $T_{vj}=25^{\circ}C$	---	550	---	ns
t_r	Turn-on Rise Time		---	220	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	540	---	ns
t_f	Turn-off Fall Time		---	140	---	ns
E_{on}	Turn-on Switching Loss		---	49.0	---	mJ
E_{off}	Turn-off Switching Loss		---	81.5	---	mJ
I_{SC}	Short Circuit Data	$V_{GE}\leq 15V, V_{CC}=600V$ $t_p\leq 10\mu s, T_{vj}=25^{\circ}C$	---	1800	---	A
R_{thJC}	Thermal Resistance, Junction to Case	Per IGBT	---	0.038	---	K/W

**Diode - Inverter
Maximum Rated Values**

Symbol	Description	Conditions	Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}=25^{\circ}C$	1200	V
I_F	Continuous DC Forward Current		600	A
I_{FRM}	Repetitive Peak Collector Current	$t_p=1ms$	1200	A

Characteristic Values

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V _F	Forward Voltage	I _F =600A, V _{GE} =0V, T _{vj} =25°C	---	1.8	2.0	V
		I _F =600A, V _{GE} =0V, T _{vj} =125°C	---	1.9	---	V
t _{rr}	Reverse Recovery Time	I _F =600A, V _R =600V, V _{GE} =-15V T _{vj} =25°C	---	0.37	---	us
Q _r	Recovered Charge		---	52.3	---	uC
E _{rec}	Reverse Recovery Energy		---	7.8	---	mJ
R _{thJC}	Thermal Resistance, Junction to Case	Per Diode	---	0.064	---	K/W

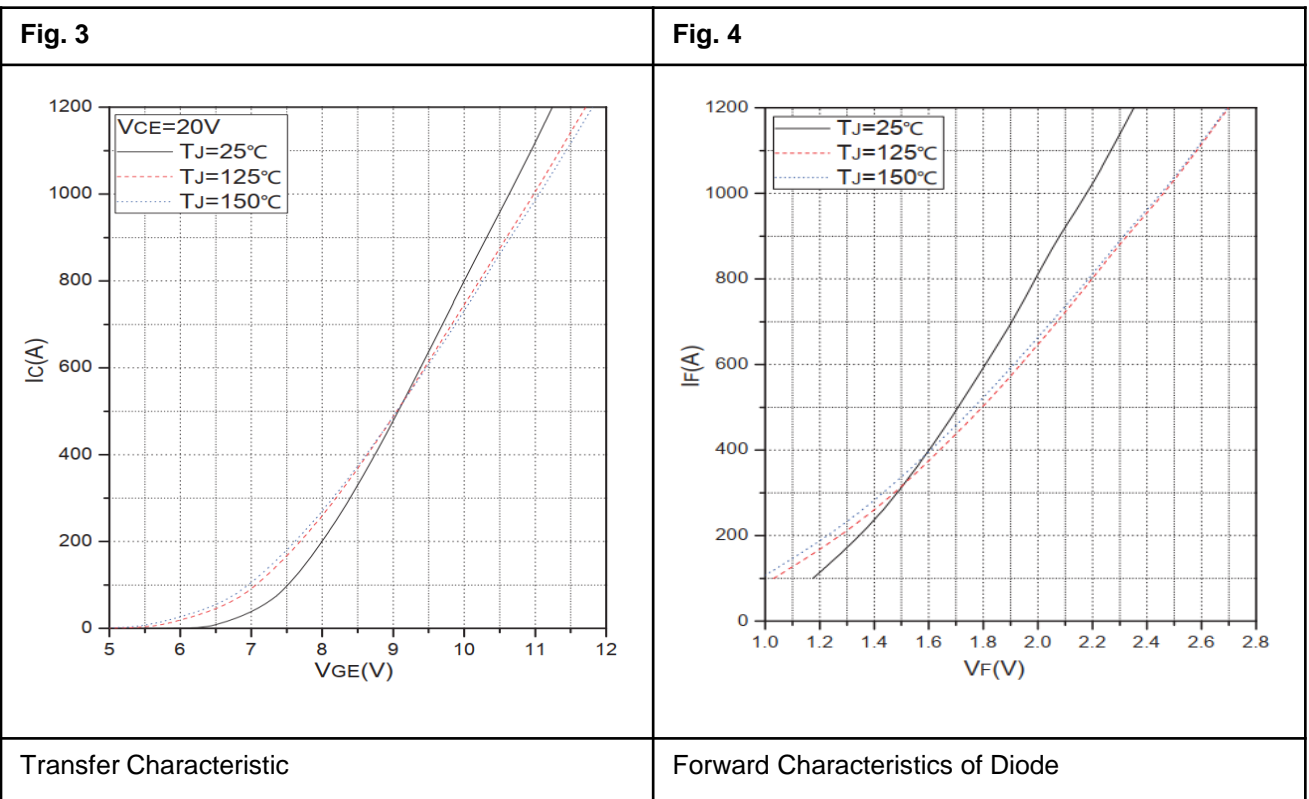
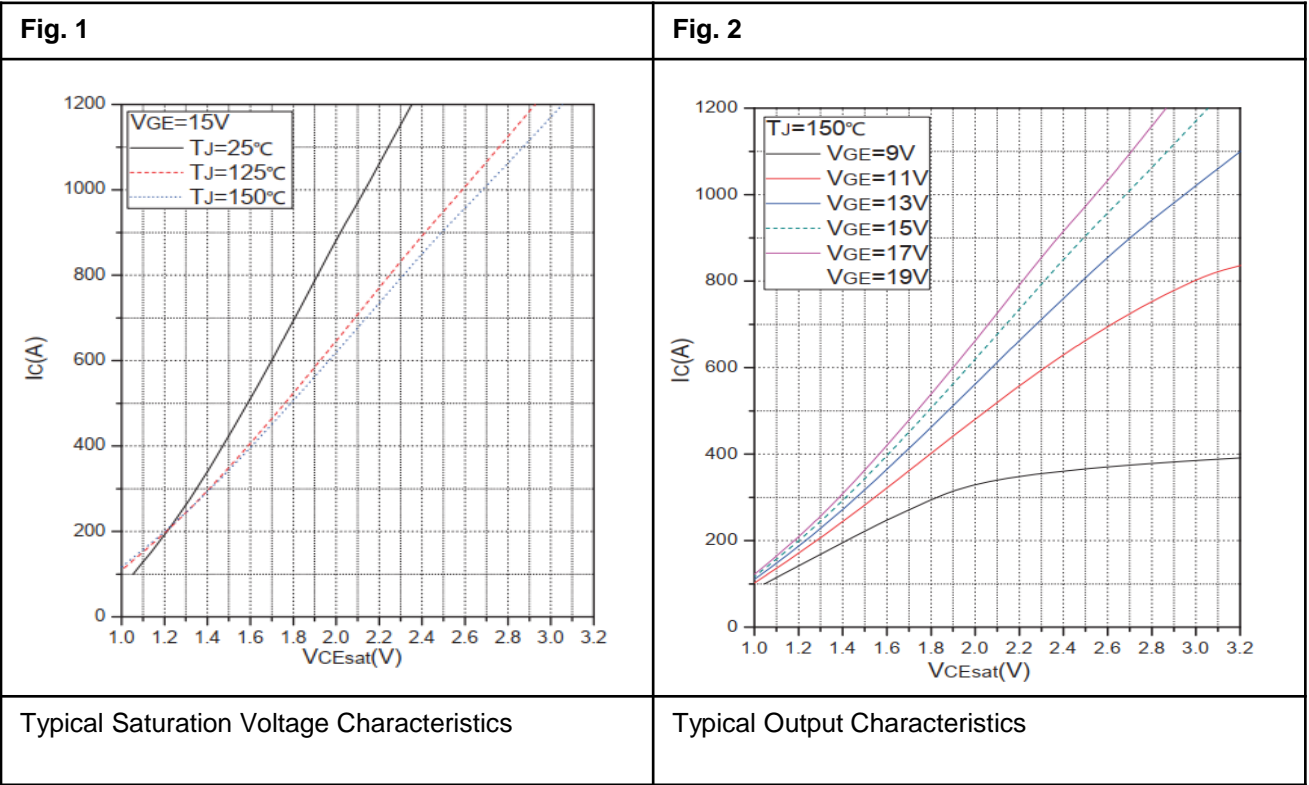
**NTC-Thermistor
Characteristic Values**

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
R ₂₅	Rated Resistance	T _C =25°C	---	5	---	KΩ
B _{25/50}	B Value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298 \text{ K}))]$	---	3380	---	K

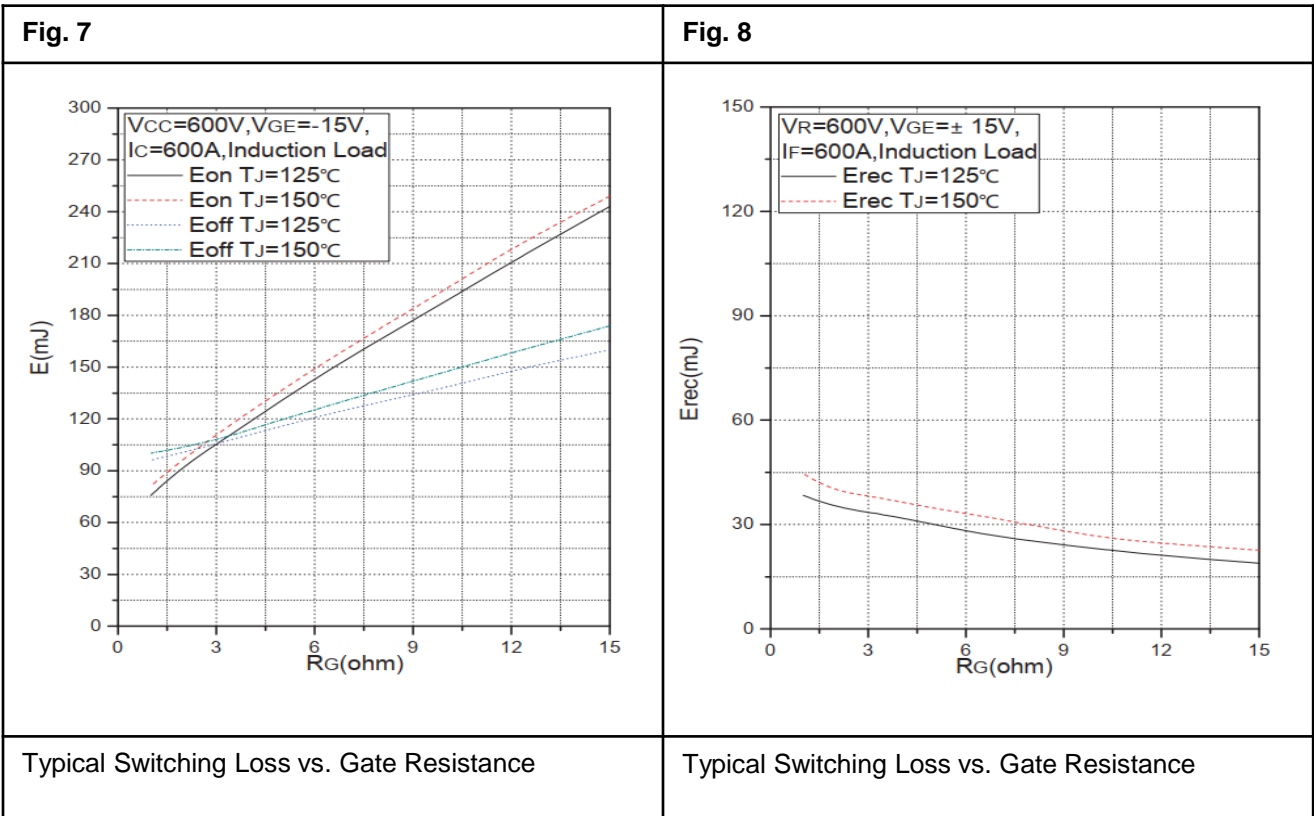
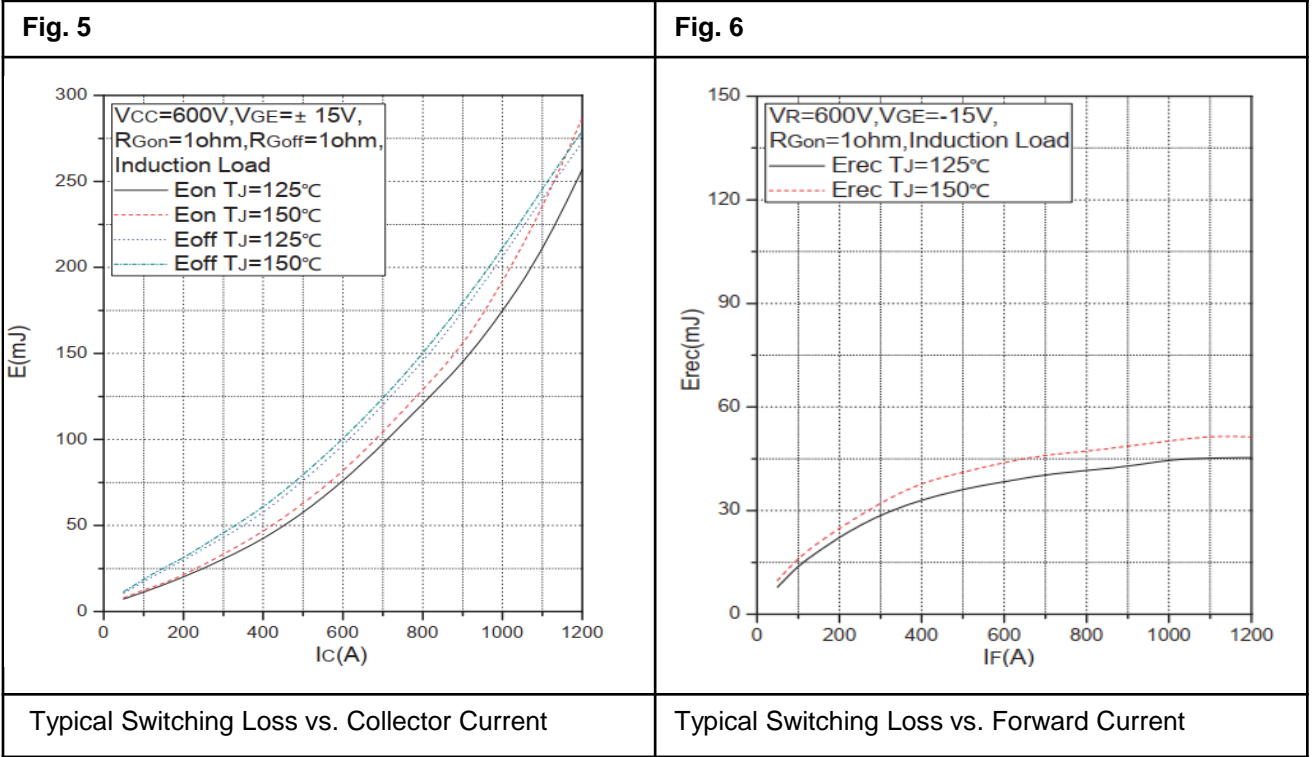
Module

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V _{ISOL}	Isolation Test Voltage	RMS, f=50Hz, t=1min	2.5	---	---	KV
L _{sCE}	Stray Inductance Module		---	20	---	nH
M _t	Main terminals M6 Screw		3.0	---	5.0	N·m
R _{θcs}	Case-To-Sink Thermally (Conductive Grease Applied)		---	0.02	---	°C/W
G	Weight		---	330	---	g

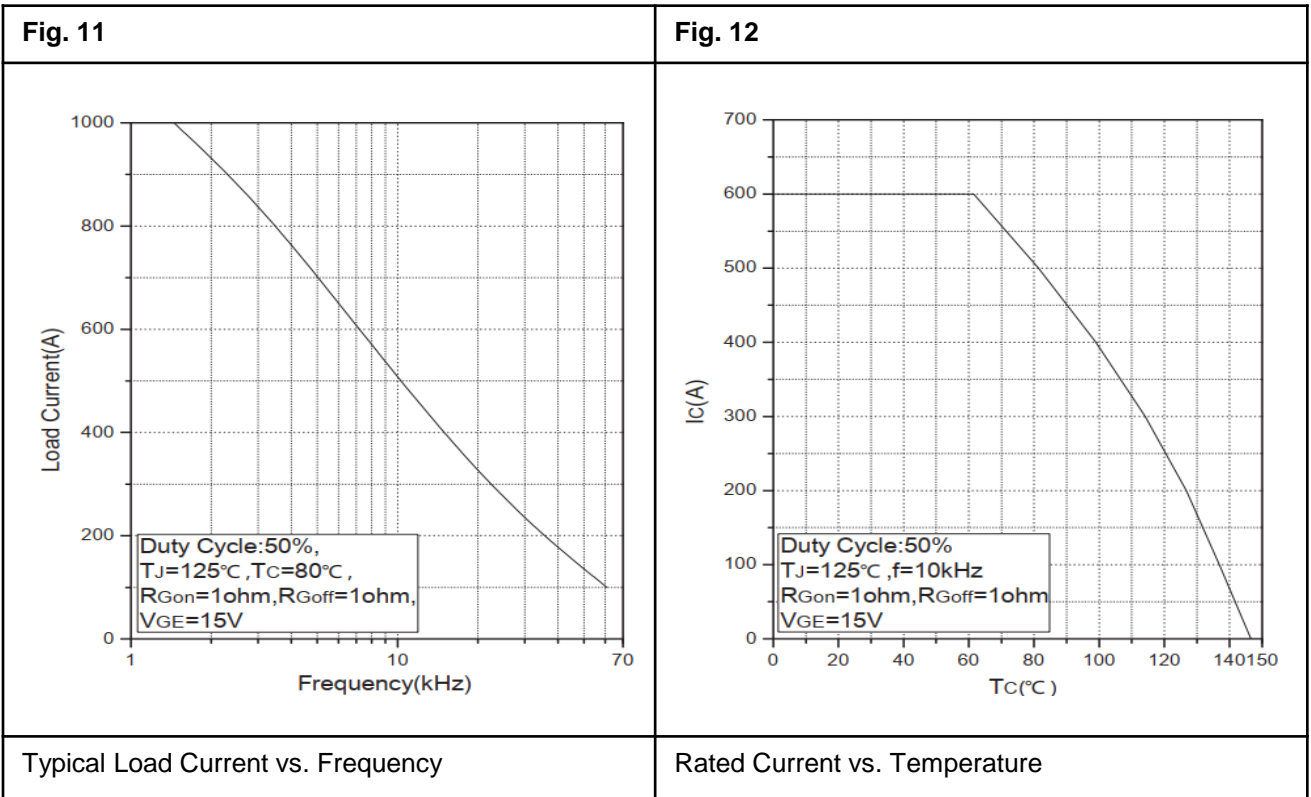
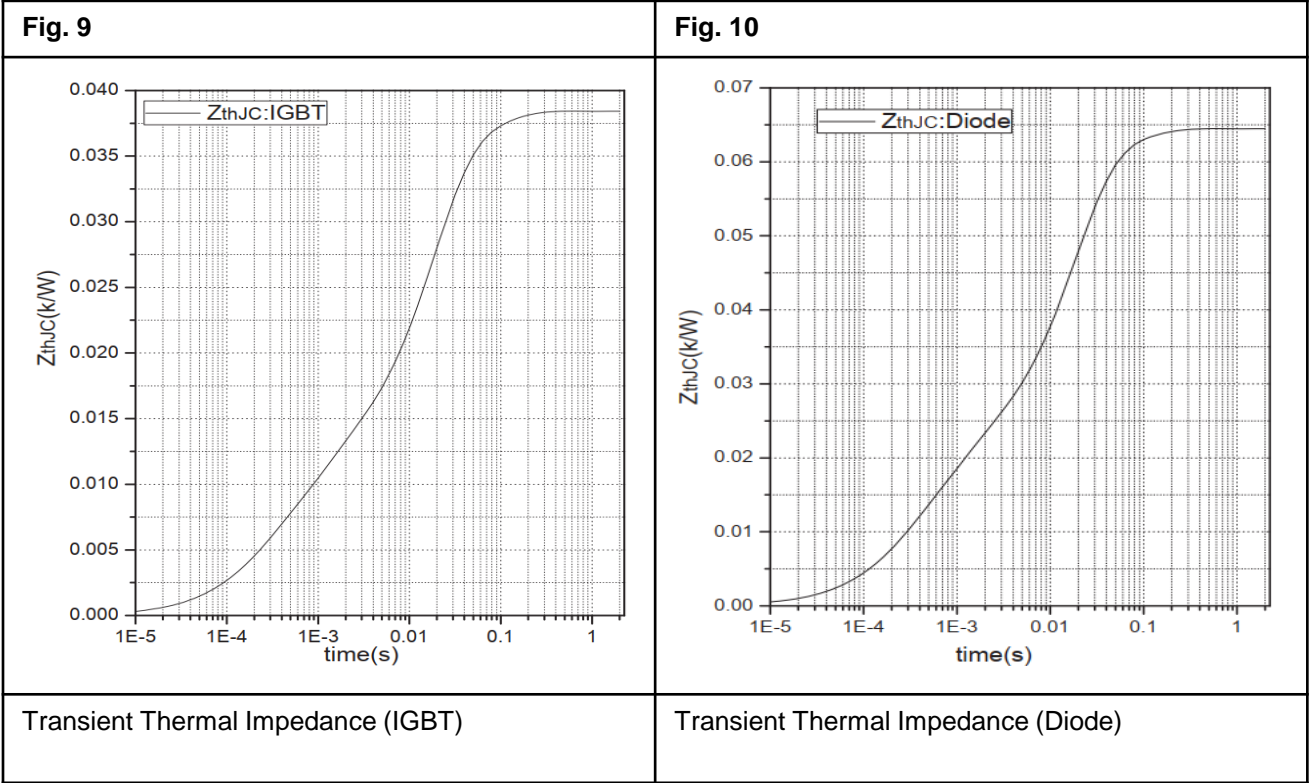
Typical Characteristics



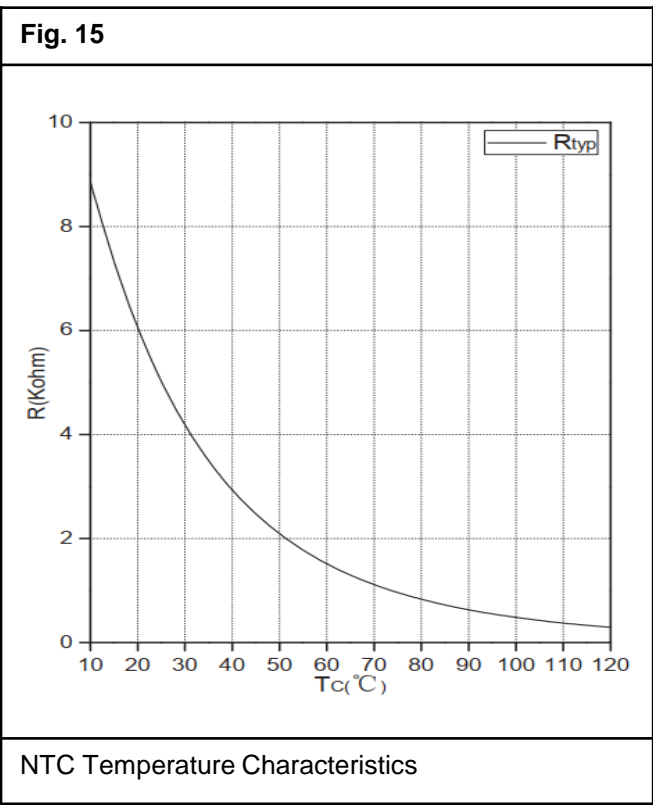
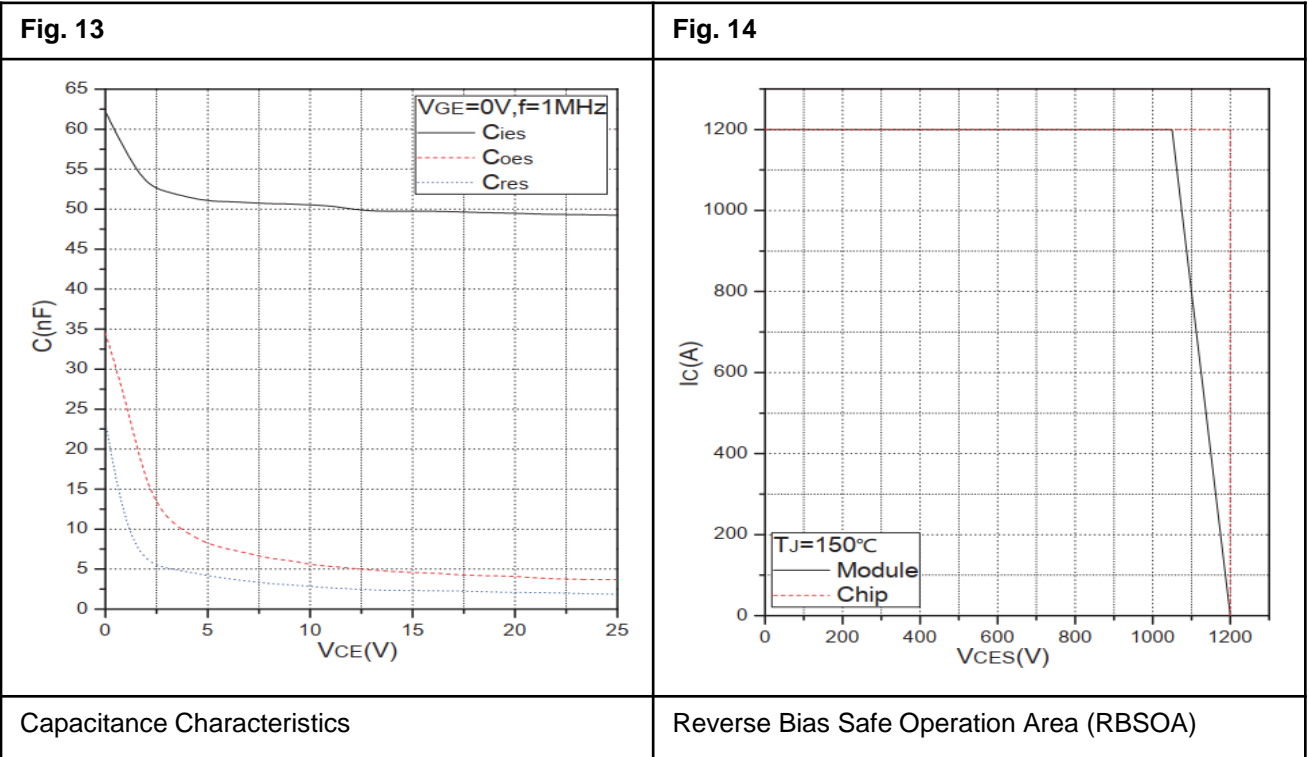
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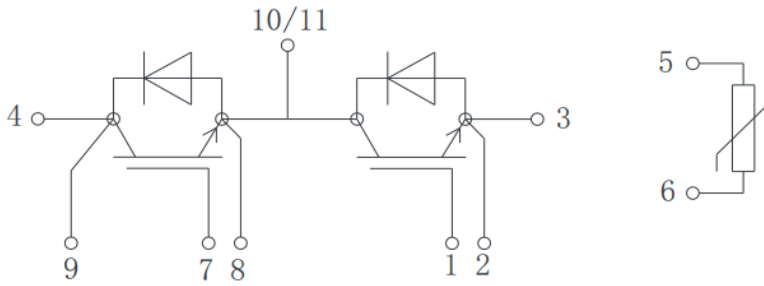
Typical Characteristics



Typical Characteristics



Circuit Diagram



Package Outlines (mm)

