



SANYO Semiconductors

DATA SHEET

An ON Semiconductor Company

TIG110BF — High Power High Speed Switching Applications

N-Channel Non Punch Through IGBT

Features

- Low-saturation voltage
- Ultrahigh speed switching
- Enhansment type

Specifications

Absolute Maximum Ratings at Ta=25°C, Unless otherwise specified

Parameter	Symbol	Conditions		Ratings	Unit
Collector-to-Emitter Voltage	V _{CES}			600	V
Gate-to-Emitter Voltage	V _{GES}			±30	V
Collector Current (DC)	I _{Cc} *1	Limited by Tjmax		27	A
	I _C *2	Limited by Tjmax	@Tc=25°C*3	14	A
			@Tc=100°C*3	6	A
Collector Current (Pulse)	I _{CP}	Pulse width Limited by Tjmax		108	A
Allowable Power Dissipation	P _D			2	W
		Tc=25°C (SANYO's ideal heat dissipation condition)*3		30	W
Junction Temperature	T _j			150	°C
Storage Temperature	T _{stg}			-55 to +150	°C

Note : *1 Shows chip capability

*2 Collector current is calculated from the following for mula

$$I_C(T_C) = \frac{T_{jmax} - T_C}{R_{th(j-c)} \times V_{CE(sat)max}(T_{jmax}, I_C(T_C))}$$

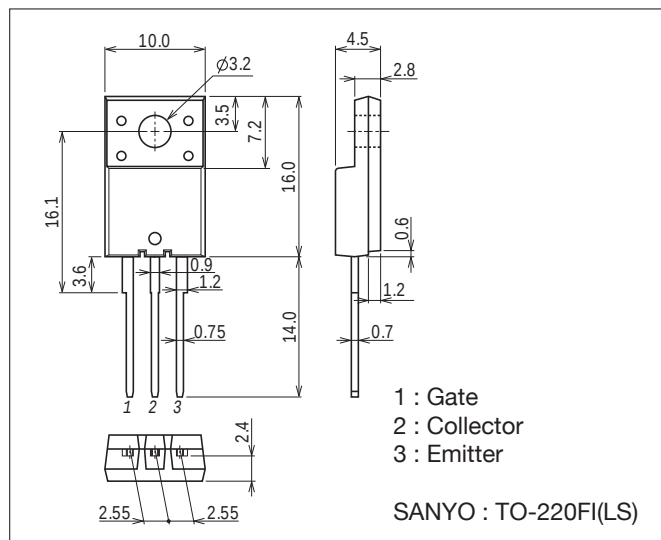
*3 SANYO's condition is radiation from backside.

The method is applying silicone grease to the backside of the device and attaching the device to water-cooled radiator made of aluminium.

Package Dimensions

unit : mm (typ)

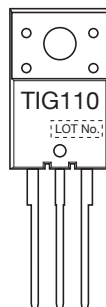
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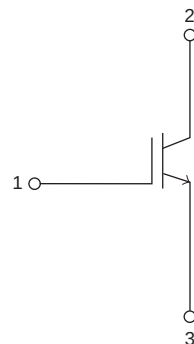
Product & Package Information

- Package : TO-220FI(LS)
- JEITA, JEDEC : SC-67, SOT-186A, TO-220F
- Minimum Packing Quantity : 100 pcs./bag, 50 pcs./magazine

Marking



Electrical Connection



SANYO Semiconductor Co., Ltd.

<http://semicon.sanyo.com/en/network>

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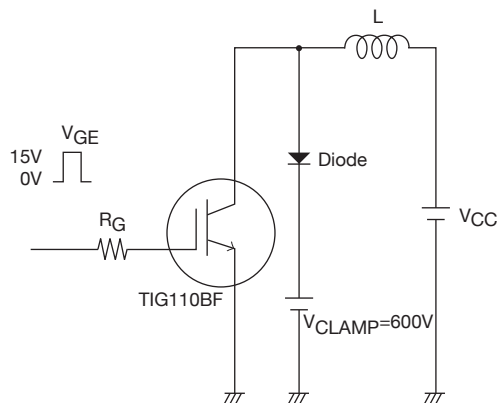
Electrical Characteristics at $T_j=25^{\circ}\text{C}$, Unless otherwise specified

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Collector-to-Emitter Breakdown Voltage	$V_{(BR)CES}$	$I_C=1\text{mA}$, $V_{GE}=0\text{V}$	600			V
Collector-to-Emitter Cutoff Current	I_{CES}	$V_{CE}=600\text{V}$, $V_{GE}=0\text{V}$			100	μA
		$T_j=125^{\circ}\text{C}$			1	mA
Gate-to-Emitter Leakage Current	I_{GES}	$V_{GE}=\pm 30\text{V}$, $V_{CE}=0\text{V}$			± 100	nA
Gate-to-Emitter Threshold Voltage	$V_{GE(off)}$	$V_{CE}=10\text{V}$, $I_C=1\text{mA}$	4.0	5.0	6.0	V
Collector-to-Emitter Saturation Voltage	$V_{CE(sat)1}$	$V_{GE}=15\text{V}$, $I_C=15\text{A}$		1.6	2.0	V
	$V_{CE(sat)2}$	$T_j=125^{\circ}\text{C}$		1.75		V
		$V_{GE}=15\text{V}$, $I_C=40\text{A}$		2.2		V
Input Capacitance	C_{ies}	$V_{CE}=30\text{V}$, $f=1\text{MHz}$		2880		pF
Output Capacitance	C_{oes}			45		pF
Reverse Transfer Capacitance	C_{res}			38		pF
Turn-ON Delay Time	$t_{d(on)}$	$L=200\mu\text{H}$, $V_{GE}=15\text{V}$, $I_C=15\text{A}$, $V_{CC}=300\text{V}$, $R_g=30\Omega$, See specified Test Circuit.		65		ns
Rise Time	t_r			30		ns
Turn-ON Time	t_{on}			300		ns
Turn-OFF Delay Time	$t_{d(off)}$			250		ns
Fall Time	t_f			120		ns
Turn-OFF Time	t_{off}			450		ns
Total Gate Charge	Q_g	$V_{CE}=300\text{V}$, $V_{GE}=15\text{V}$, $I_C=15\text{A}$		95		nC
Gate-to-Source Charge	Q_{gs}			20		nC
Gate-to-Drain "Miller" Charge	Q_{gd}			30		nC

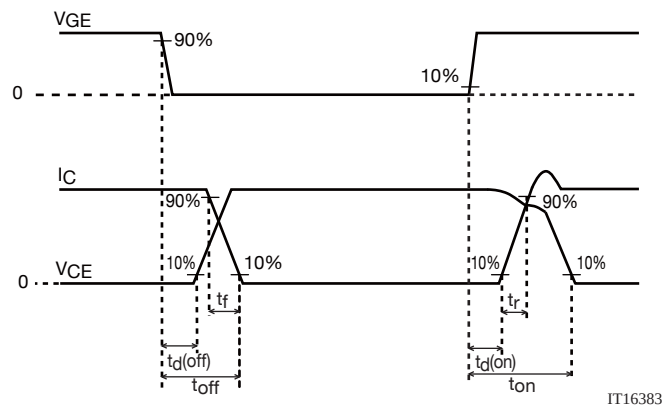
Thermal Characteristics at $T_a=25^{\circ}\text{C}$, Unless otherwise specified

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Thermal Resistance (Junction- Case)	$R_{th(j-c)}$	$T_c=25^{\circ}\text{C}$ (SANYO's ideal heat dissipation condition)*3			4.17	$^{\circ}\text{C} / \text{W}$
Thermal Resistance (Junction- at mosphere)	$R_{th(j-a)}$				62.5	$^{\circ}\text{C} / \text{W}$

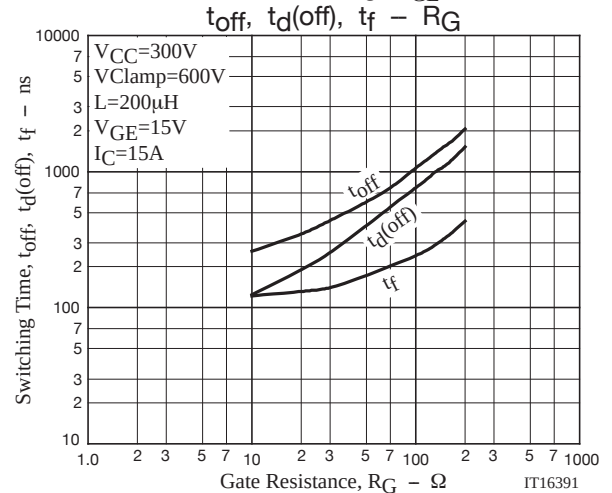
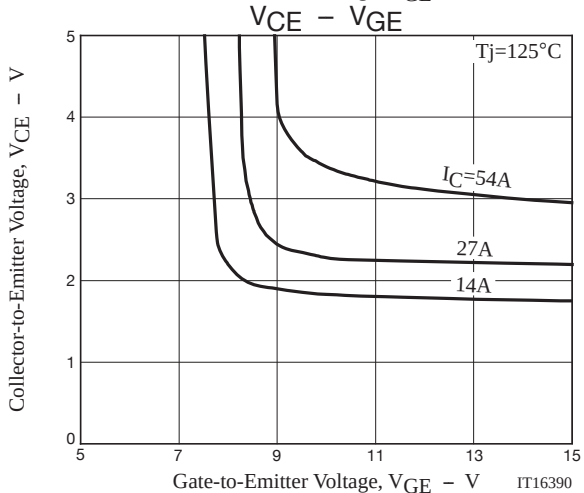
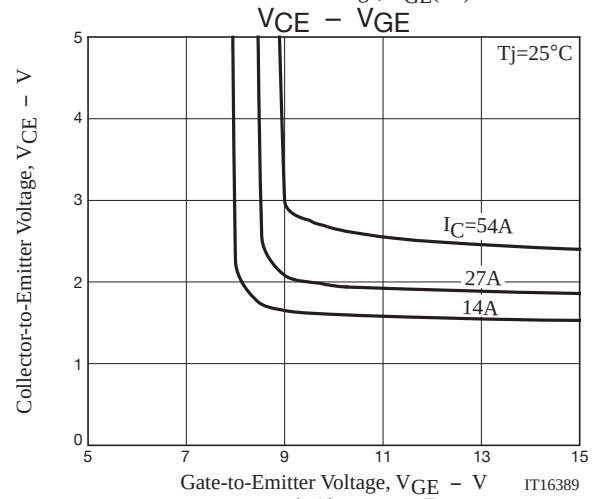
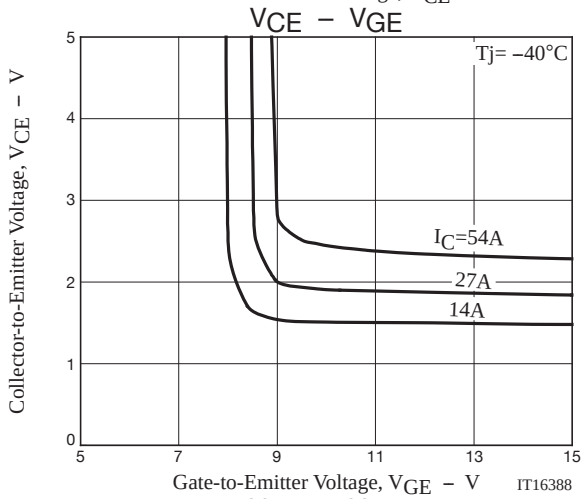
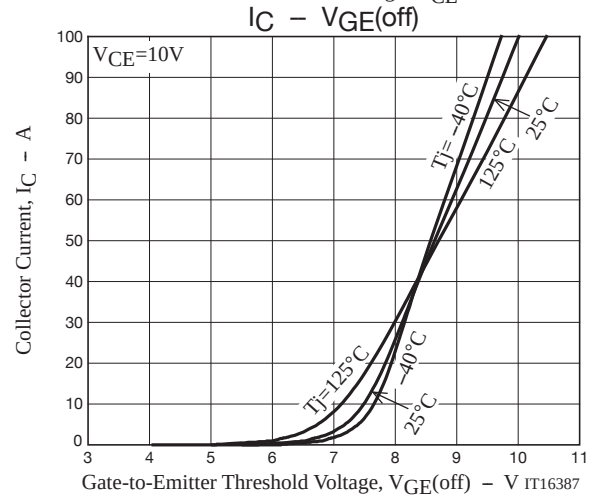
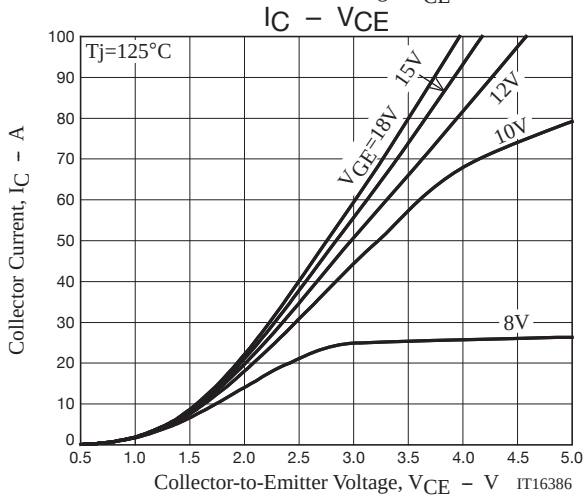
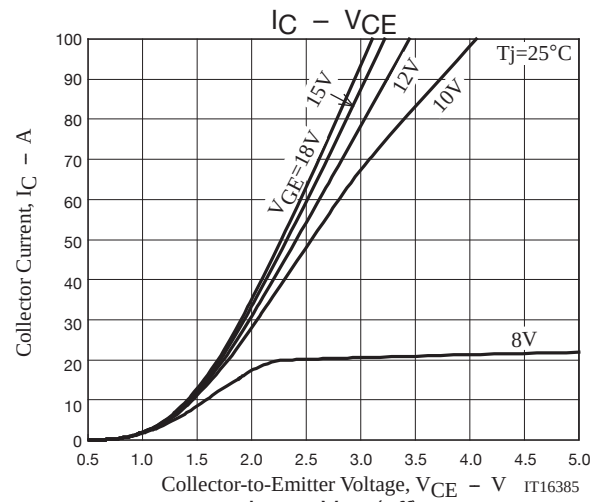
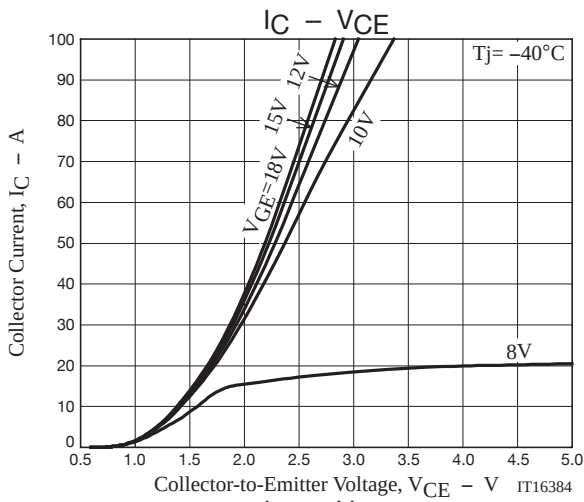
Switching Time Test Circuit

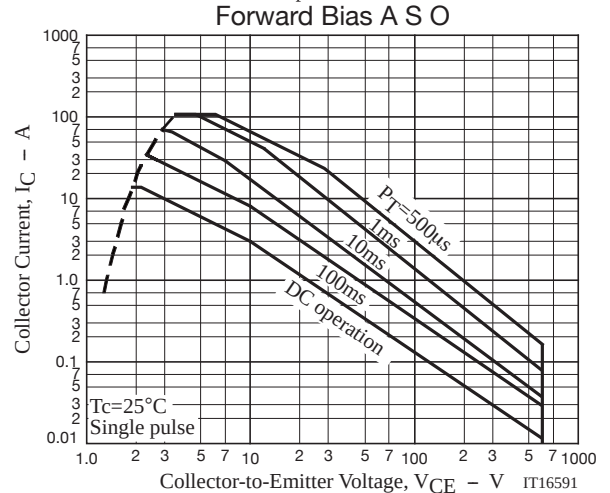
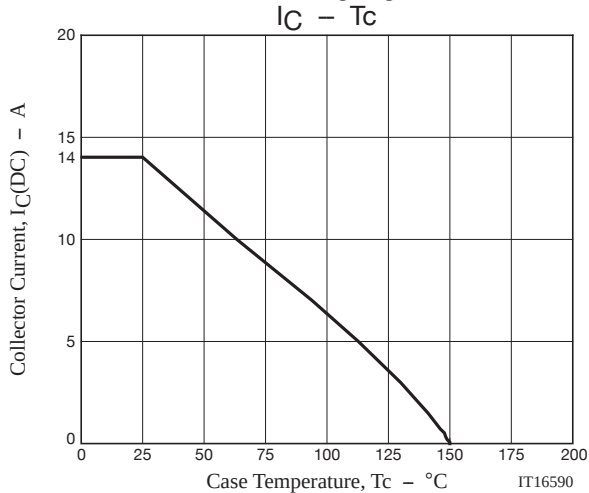
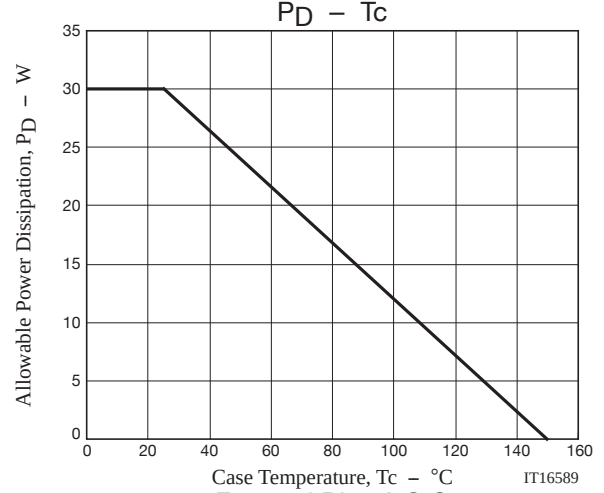
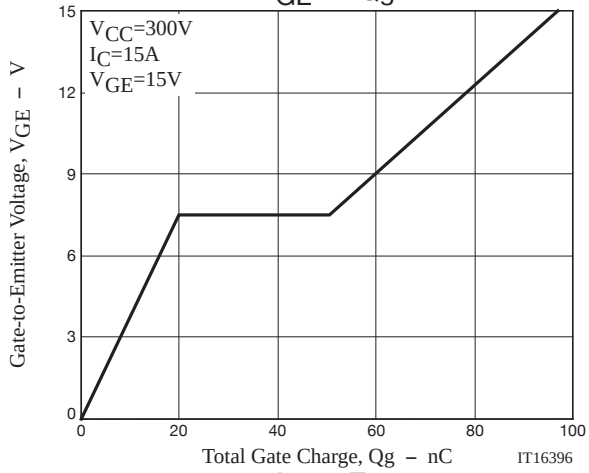
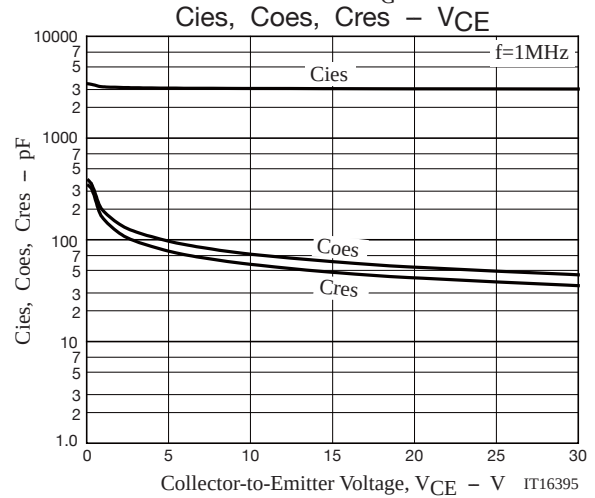
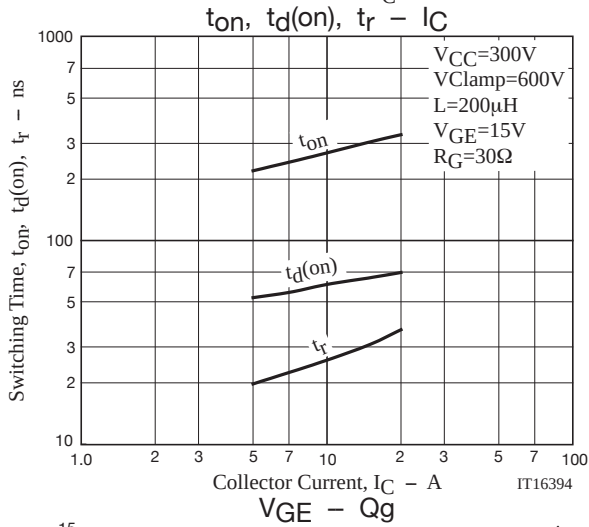
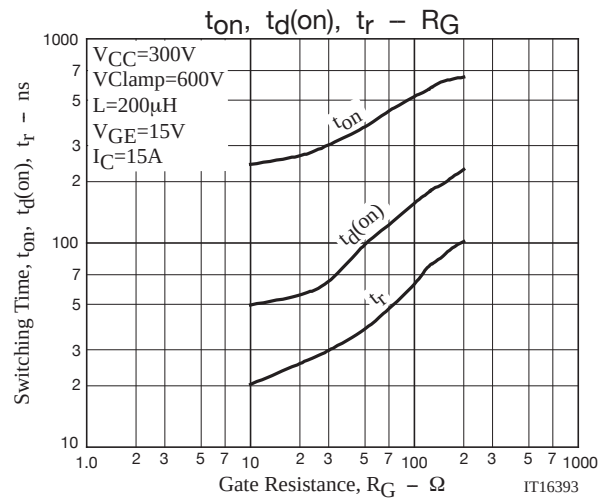
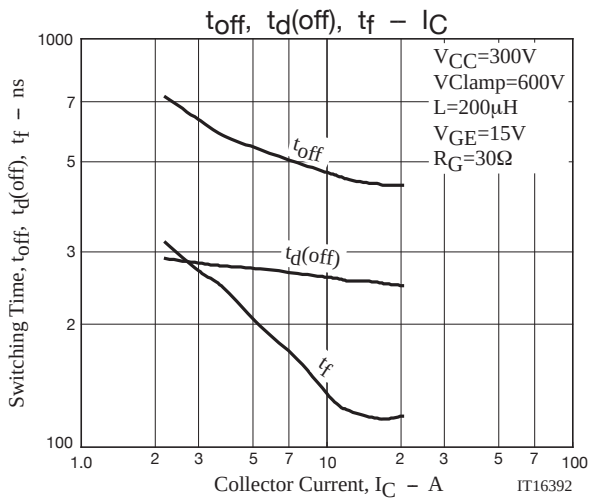


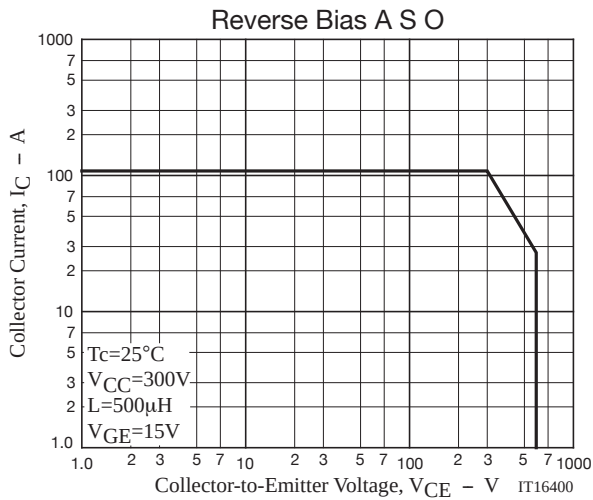
Timing Chart



TIG110BF







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