

# IGBT MODULE

# GAE150BA60



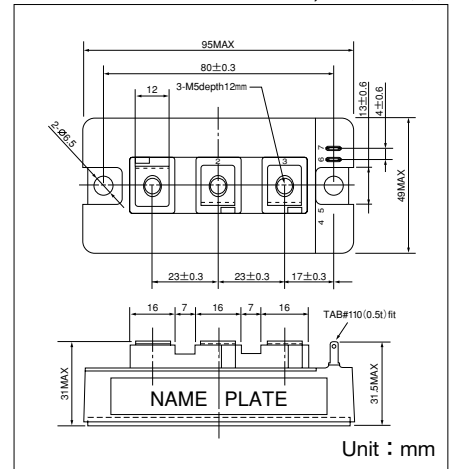
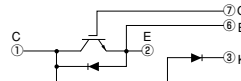
UL;E76102 (M)

**SanRex** IGBT Module **GAE150BA60** is designed for high speed, high current switching applications. This Module is electrically isolated and contains IGBT connected with clamp diode in series, soft recovery diode ( $t_{rr}=0.1\ \mu\text{s}$ ) reverse connected across IGBT.

- $I_C=150\text{A}$   $V_{CES}=600\text{V}$
- $V_{CE(sat)}=2.4\text{V Typ}$
- $t_f=0.10\ \mu\text{s Typ}$
- Soft recovery diode

**(Applications)**

Brake for motor control (chopper)



**Maximum Ratings**

( $T_j=25^\circ\text{C}$  unless otherwise specified)

Symbol	Item		Conditions	Ratings		Unit
				GAE150BA60		
$V_{CES}$	Collector-Emitter Voltage		with gate terminal shorted to emitter	600		V
$V_{GES}$	Gate-Emitter Voltage		with collector shorted to emitter	$\pm 20$		V
$I_C$	Collector Current	DC		150		A
$I_{CP}$		Pulse ( 1 ms)		300		
$-I_C$	Reverse Collector Current			150		A
$P_C$	Total Power Dissipation		$T_c=25^\circ\text{C}$	600		W
$T_j$	Junction Temperature			150		$^\circ\text{C}$
$T_{stg}$	Storage Temperature			-40 to +125		$^\circ\text{C}$
$V_{iso}$	Isolation Voltage (R.M.S.)		A.C. 1 minute	2500		V
	Mounting Torque	Mounting (M6)	Recommended Value 2.5-3.9 (25-40)	4.7 (48)		N·m (kgf·cm)
		Terminal (M5)	Recommended Value 1.5-2.5 (15-25)	2.7 (28)		
	Mass		Typical Value	225		g

**Electrical Characteristics**

Symbol	Item		Conditions	Ratings			Unit
				Min.	Typ.	Max.	
$I_{GES}$	Gate Leakage Current		$V_{GE}=\pm 20\text{V}$ , $V_{CE}=0\text{V}$			$\pm 500$	nA
$I_{CES}$	Collector Cut-Off Current		$V_{CE}=600\text{V}$ , $V_{GE}=0\text{V}$			1.0	mA
$V_{(BR)CES}$	Collector-Emitter Breakdown Voltage		$V_{GE}=0\text{V}$ , $I_C=1\text{mA}$	600			V
$V_{GE(th)}$	Gate Threshold Voltage		$V_{CE}=10\text{V}$ , $I_C=15\text{mA}$	3.0		7.0	V
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage		$I_C=150\text{A}$ , $V_{GE}=15\text{V}$		2.4	2.8	V
$C_{ies}$	Input Capacitance		$V_{CE}=10\text{V}$ , $V_{GE}=0\text{V}$ , $f=1\text{MHz}$		9	15	nF
$t_r$	Switching Time	Rise Time	$I_C=150\text{A}$ , $V_{GE}=+15\text{V}/-5\text{V}$ $V_{CC}=300\text{V}$ , $R_G=4\ \Omega$		0.10	0.20	$\mu\text{s}$
$t_{d(on)}$		Turn-on Delay Time			0.20	0.40	
$t_f$		Fall Time			0.10	0.20	
$t_{d(off)}$		Turn-off Delay Time			0.40	0.80	
$V_{ECS}$	Emitter-Collector Voltage		$-I_C=150\text{A}$ , $V_{GE}=0\text{V}$		2.30	2.80	V
$t_{rr}$	Reverse Recovery Time		$-I_C=150\text{A}$ , $V_{GE}=-10\text{V}$ , $di/dt=300\text{A}/\mu\text{s}$		0.1	0.15	$\mu\text{s}$
$R_{th(j-c)}$	Thermal Resistance		IGBT-Case			0.21	$^\circ\text{C}/\text{W}$
			Diode-Case			0.50	
$V_{FM}$	Forward Voltage Drop		$I_F=150\text{A}$ , At Clamp Diode		2.30	2.80	V
$t_{rr}$	Reverse Recovery Time		$I_F=150\text{A}$ , $di_F/dt=-300\text{A}/\mu\text{s}$ , At Clamp Diode		0.1	0.15	$\mu\text{s}$
$R_{th(j-c)}$	Thermal Resistance		Junction-Case, At Clamp Diode			0.50	$^\circ\text{C}/\text{W}$

