

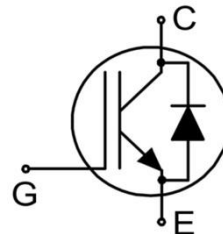
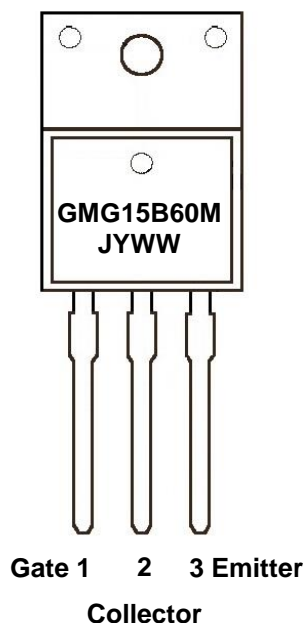
Features

- ◆ Trench Field Stop technology
- ◆ Low $V_{CE,SAT}$
- ◆ Fast Switching Characteristics
- ◆ Short Circuit Withstand Duration: 10 μ s
- ◆ Low Turnoff Voltage Spike
- ◆ Ultrafast Recovery Diode embedded
- ◆ Low Forward Voltage
- ◆ Low Leakage Current

Applications

- ◆ Frequency Conversion Appliances
- ◆ Industrial Sewing Machine
- ◆ General Purpose Frequency Conversion

Marking Information and Pin Assignment (Top View)



J: Assembly / Test Site Code
Y: Year
WW: Week

Order Information

Ordering Number	Package	Shipping
GMG15B60MTBF3T	TO-220F Full Pack	50 Units/Tube. 40 Tubes/Box, 4 Boxes/Carton

Absolute Maximum Ratings (Note 1)

SYMBOL	PARAMETER		RATINGS	UNITS
V_{CES}	Collector to Emitter Voltage		600	V
I_C	Collector Current	$T_C = 25^{\circ}\text{C}$	30	A
		$T_C = 100^{\circ}\text{C}$	15	
I_{CP} (Note 2)	Collector Pulse Current		45	A
I_{RBSOA} (Note 2)	RBSOA Current $V_{CE} \leq 600\text{V}$, $T_J \leq 150^{\circ}\text{C}$		45	A
I_F	Diode Forward Current	$T_C = 25^{\circ}\text{C}$	30	A
		$T_C = 100^{\circ}\text{C}$	15	
I_{FP}	Diode Pulse Current		45	A
V_{GE}	Gate-Emmitter Voltage		± 20	V
t_{SC}	Short Circuit Withstand Duration, $V_{GE}=15\text{V}$, $V_{CC}=400\text{V}$, $T_J \leq 150^{\circ}\text{C}$		10	μs
P_{TOT}	Power dissipation, $T_C = 25^{\circ}\text{C}$		26	W
T_J	Maximum IGBT Junction Temperature		$-55 \sim 150$	$^{\circ}\text{C}$
T_{stg}	Storage Temperature Range		$-55 \sim 150$	$^{\circ}\text{C}$

Note 1 Compliance to JESD-022

Note 2 Simulated Results

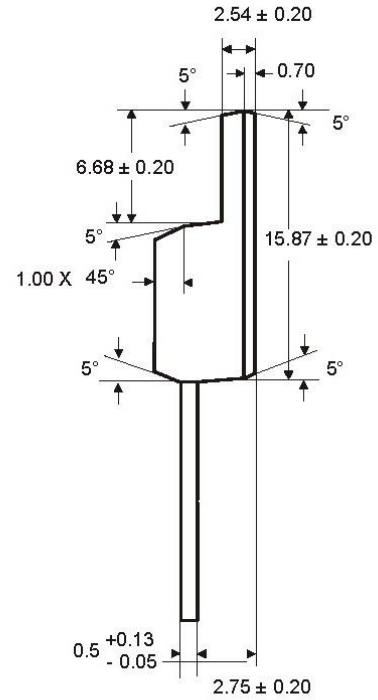
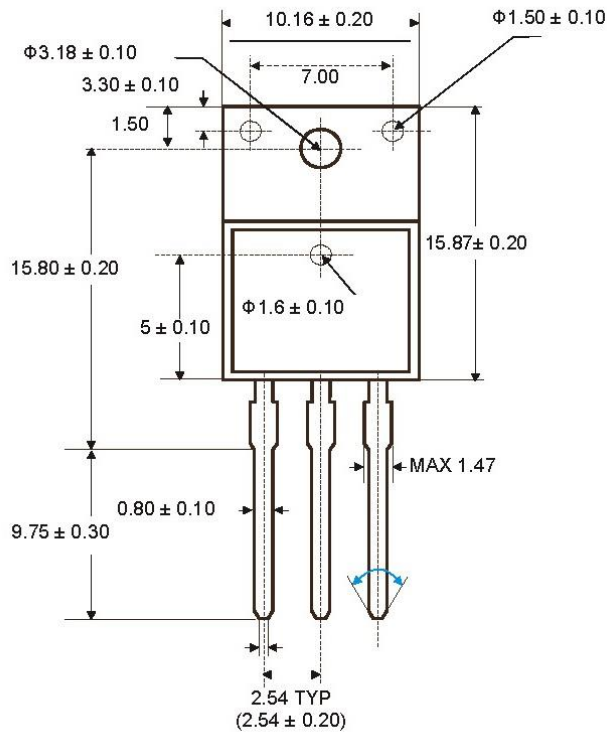
Note 3 Short Circuit < 1000 times, Short Circuit Interval: > 1s

Electrical Characteristics (T_J = 25°C, unless otherwise noted)

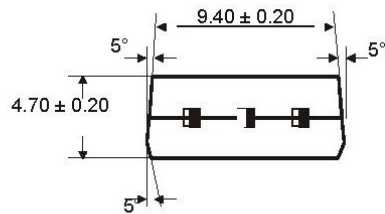
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Statistic Characteristic						
Collector to Emitter Breakdown Voltage	V _{BR,CE}	V _{GE} =0V, I _C =250μA	600			V
Collector to Emitter Saturation Voltage	V _{CE,SAT}	I _C =15A, V _{GE} =15V		1.7	2.3	V
		I _C =15A, V _{GE} =15V, T _J =150°C		2.2		
Diode Forward Voltage	V _F	V _{GE} =0V I _F =15A		1.75		V
		V _{GE} =0V I _F =15A, T _J =150°C		1.45		
Gate Threshold Voltage	V _{GE}	V _{CE} =V _{GE} , I _C =250μA	4.5	5.7	6.5	V
Collector Leakage Current	I _{CES}	V _{CE} =600V, V _{GE} =0V			0.1	mA
		V _{CE} =600V, V _{GE} =0V, T _J =150°C			4	
Gate Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} =20V			200	nA
Transconductance	g _{FS}	V _{CE} =20V, I _C =15A		5.9		S
Dynamic Characteristic						
Input Capacitance	C _{ISS}	V _{CE} =25V, V _{GE} =0V , f=1MHz		1095		pF
Output Capacitance	C _{OSS}			60		pF
Reverse Transfer Capacitance	C _{RES}			32		pF
Gate Charge	Q _G	V _{CC} =480V, I _C =15A, V _{GE} =15V		59		nC
IGBT Switching Characteristic						
Turn ON Delay time	t _{D(ON)}	V _{CC} =400V, I _C =15A, V _{GE} =0/15V, R _G =10Ω, inductive load		30		ns
Rise Time	t _r			30		
Turn OFF delay time	t _{D(OFF)}			45		
Fall Time	t _f			97		
Turn ON Energy Loss	E _{ON}			0.60		mJ
Turn OFF Energy Loss	E _{OFF}			0.19		
Switching Energy Loss	E _{ts}			0.79		
Diode Switching Characteristic						
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =15A, dI _F /dt = 300A/μs		60		ns
Reverse Recovery Charge	Q _{rr}			215		nC
Reverse Recovery Peak Current	I _{rrm}			10		A

Package Dimension – TO220F

Unit: mm



Unit: mm



Ordering Number

GM G 15B60M TBF3 I

APM Gamma Micro	Product Category	Short Description	Package Type	Shipping Type
	Discrete IGBT	15: $I_C = 15A$ 60: $V_{CE} = 600V$	TBF3: 3L TO220F Full Pack	T: Tube

Note:

Green products:

- ♦ Halogen free(Br or Cl does not exceed 900ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500ppm by weight)