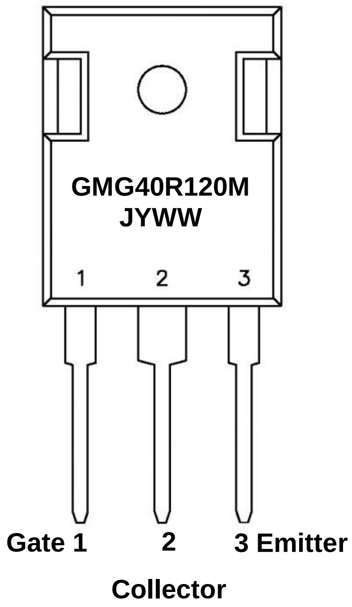
Features

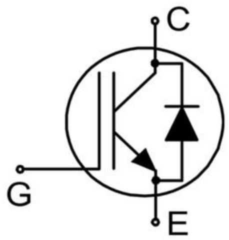
- Trench Field Stop technology
- Fast Switching Characteristics
- Low Turnoff Voltage Spike
- Ultrafast Recovery Didoe embeded
- Low Forward Voltage
- Low Leakage Current

Applications

- Welding Machine
- Uninterruptable Power System, UPS
- High Frequency Conversion

Marking Information and Pin Assignment – TO-247 (Top View)





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

Order Information

Ordering Number	Package	Shipping
GMG40R120MTD3T	TO-247	50 Units/Tube. 40 Tubes/Box, 4 Boxes/Carton

Absolute Maximum Ratings (Note 1)

SYMBOL	PARAMETER		RATINGS	UNITS
V_{CES}	Collector to Emitter Voltage		1200	V
I_C	Collector Current	T_C = 25°C	80	A
		T_C = 100°C	40	
I_{CP} (Note 2)	Collector Pulse Current		160	A
I_{RBSOA} (Note 2)	RBSOA Current $VCE \leq 600V$, $T_J \leq 150°C$, $t_p = 1\mu s$		160	A
I_F	Diode Forward Current	T_C = 25°C	40	A
		T_C = 100°C	20	
t_{SC}	Short Circuit Withstand Duration, V_{GE}=15V, V_{CC}=400V, $T_J \leq 150°C$		10	μs
I_{CF} (Note 2)	Diode Pulse Current		160	A
V_{GE}	Gate-Emmiter Voltage		± 20	V
P_{TOT}	Power dissipation,	T_C = 25°C	277	W
		T_C = 100°C	111	
T_J	Maximum IGBT Junction Temperature		-55 ~ 150	°C
T_{stg}	Storage Temperature Range		-55 ~ 150	°C

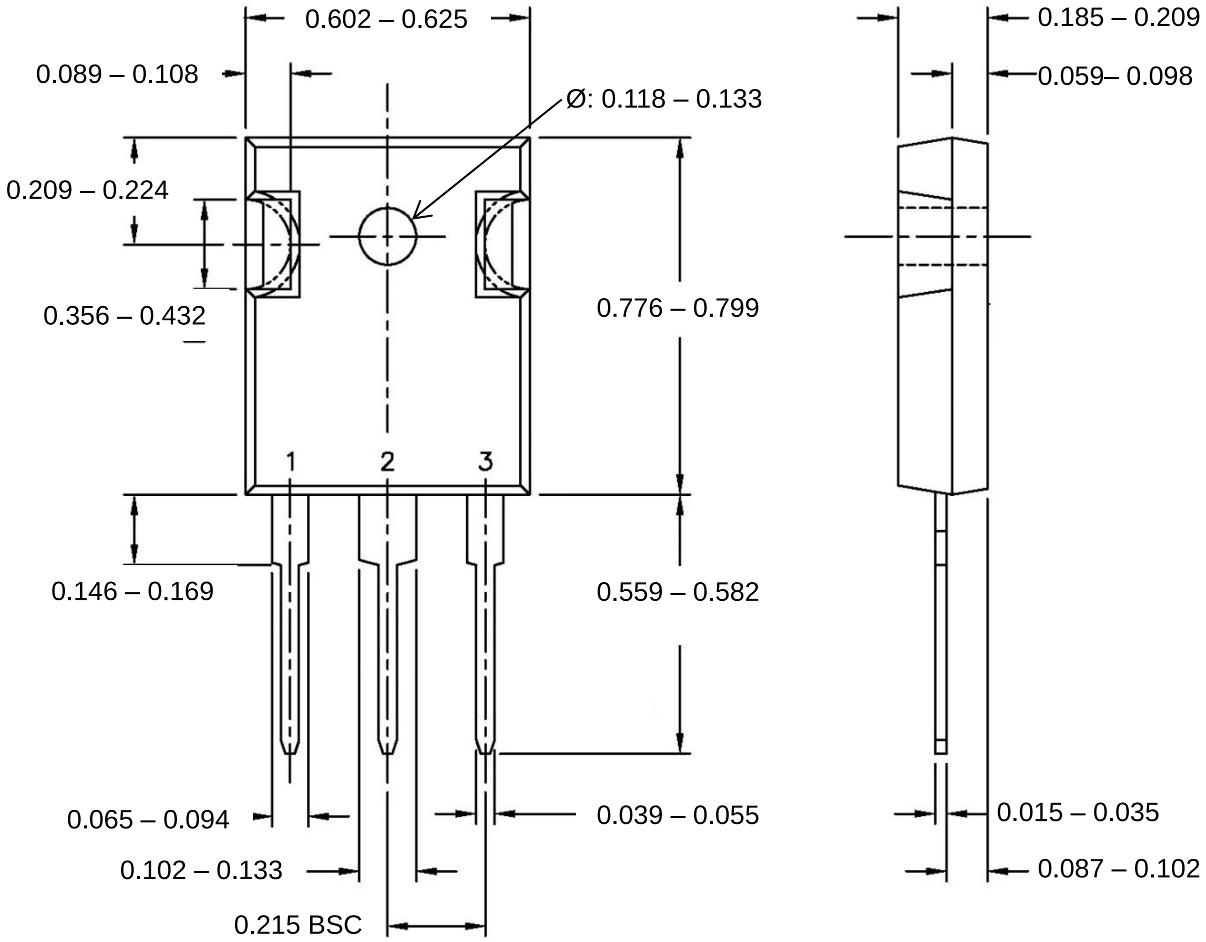
Note 1 Compliance to JESD-022
Note 2 Simulated Results
Note 3 Short Circuit < 1000 times, Short Circuit Interval: > 1s

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	1200			V
Collector to Emitter Saturation Voltage	$V_{CE,SAT}$	V_{GE}=15V, I_C=40A		1.9	2.4	V
		V_{GE}=15V, I_C=40A, T_J=150°C		2.3		
Diode Forward Voltage	V_F	V_{GE}=0V I_F=20A		2.8		V
		V_{GE}=0V I_F=20A, T_J=150°C		1.9		
Gate Threshold Voltage	V_{GE}	I_C=1mA, V_{CE}=V_{GE}	5.5	6.0	6.5	V
Collector Leakage Current	I_{CES}	V_{CE}=1200V, V_{GE}=0V			0.1	mA
		V_{CE}=1200V, V_{GE}=0V, T_J=150°C			4	
Gate Leakage Current	I_{GES}	V_{GE}=20V, V_{CE}=0V			250	nA
Transconductance	g_{FS}	V_{CE}=20V, I_C=40A		26.5		S
Dynamic Characteristic						
Input Capacitance	C_{ISS}	V_{CE}=25V, V_{GE}=0V, f=1MHz		3823		pF
Output Capacitance	C_{OSS}			170		pF
Reverse Transfer Capacitance	C_{RES}			94		pF
Gate Charge	Q_G	V_{CC}=600V, I_C=40A, V_{GE}=15V		239		nC
IGBT Switching Characteristic						
Turn ON Delay time	$t_{D(ON)}$	V_{CC}=600V, I_C=40A, V_{GE}=0/15V, R_G=10Ω, inductive load		62		ns
Rise Time	t_r			54		
Turn OFF delay time	$t_{D(OFF)}$			265		
Fall Time	t_f			30		
Turn ON Energy Loss	E_{ON}			3.3		mJ
Turn OFF Energy Loss	E_{OFF}			1.4		
Switching Energy Loss	E_{ts}			4.7		
Turn ON Delay time	$t_{D(ON)}$	V_{CC}=600V, I_C=40A, V_{GE}=0/15V, R_G=10Ω, inductive load, T_J=150°C		55		ns
Rise Time	t_r			55		
Turn OFF delay time	$t_{D(OFF)}$			306		
Fall Time	t_f			38		
Turn ON Energy Loss	E_{ON}			3.49		mJ
Turn OFF Energy Loss	E_{OFF}			1.85		
Switching Energy Loss	E_{ts}			5.34		
Diode Switching Characteristic						
Reverse Recovery Time	t_{rr}	V_R=600V, I_F=20A, dI_F/dt = 100A/μs		80		ns
Reverse Recovery Charge	Q_{rr}			1.5		μC
Reverse Recovery Peak Current	I_{rrm}			5.4		A

Package Dimension – TO247

Unite: Inches



Ordering Number

GM	G	40R120M	TD3	T
APM Gamma Micro	Product Category	Short Description	Package Type	Shipping Type
	Discrete IGBT	40: I_C = 40A 120: V_{CE} = 1200V	TD3: 3L TO247	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)