

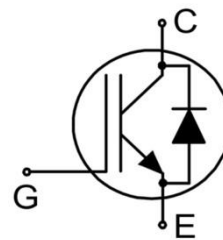
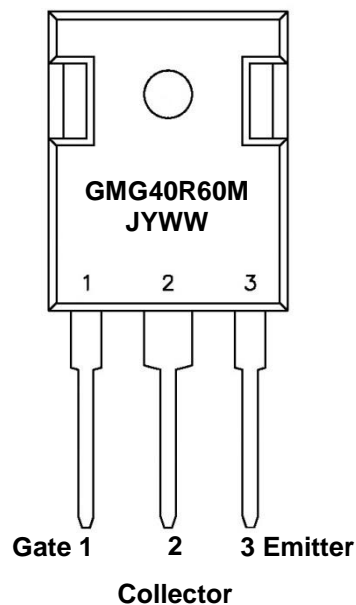
Features

- ◆ Trench Field Stop technology
- ◆ Fast Switching Characteristics
- ◆ Low Turnoff Voltage Spike
- ◆ Ultrafast Recovery Diodo embedded
- ◆ Low Forward Voltage
- ◆ Low Leakage Current

Applications

- ◆ PFC
- ◆ Welding Machine

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



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

Order Information

Ordering Number	Package	Shipping
GMG40R60MTD3T	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		600	V
I_C	Collector Current	$T_C = 25^\circ\text{C}$	80	A
		$T_C = 100^\circ\text{C}$	40	
I_{CP} (Note 2)	Collector Pulse Current		120	A
I_{RBSOA} (Note 2)	RBSOA Current $V_{CE} \leq 600\text{V}$, $T_J \leq 150^\circ\text{C}$, $t_p = 1\mu\text{s}$		120	A
I_F	Diode Forward Current	$T_C = 25^\circ\text{C}$	40	A
		$T_C = 100^\circ\text{C}$	20	
I_{FP}	Diode Pulse Current		60	A
V_{GE}	Gate-Emmitter Voltage		± 20	V
P_{TOT}	Power dissipation,	$T_C = 25^\circ\text{C}$	297	W
		$T_C = 100^\circ\text{C}$	119	
T_J	Maximum IGBT Junction Temperature		-55 ~ 150	$^\circ\text{C}$
T_{stg}	Storage Temperature Range		-55 ~ 150	$^\circ\text{C}$

Note 1 Compliance to JESD-022

Note 2 Simulated Results

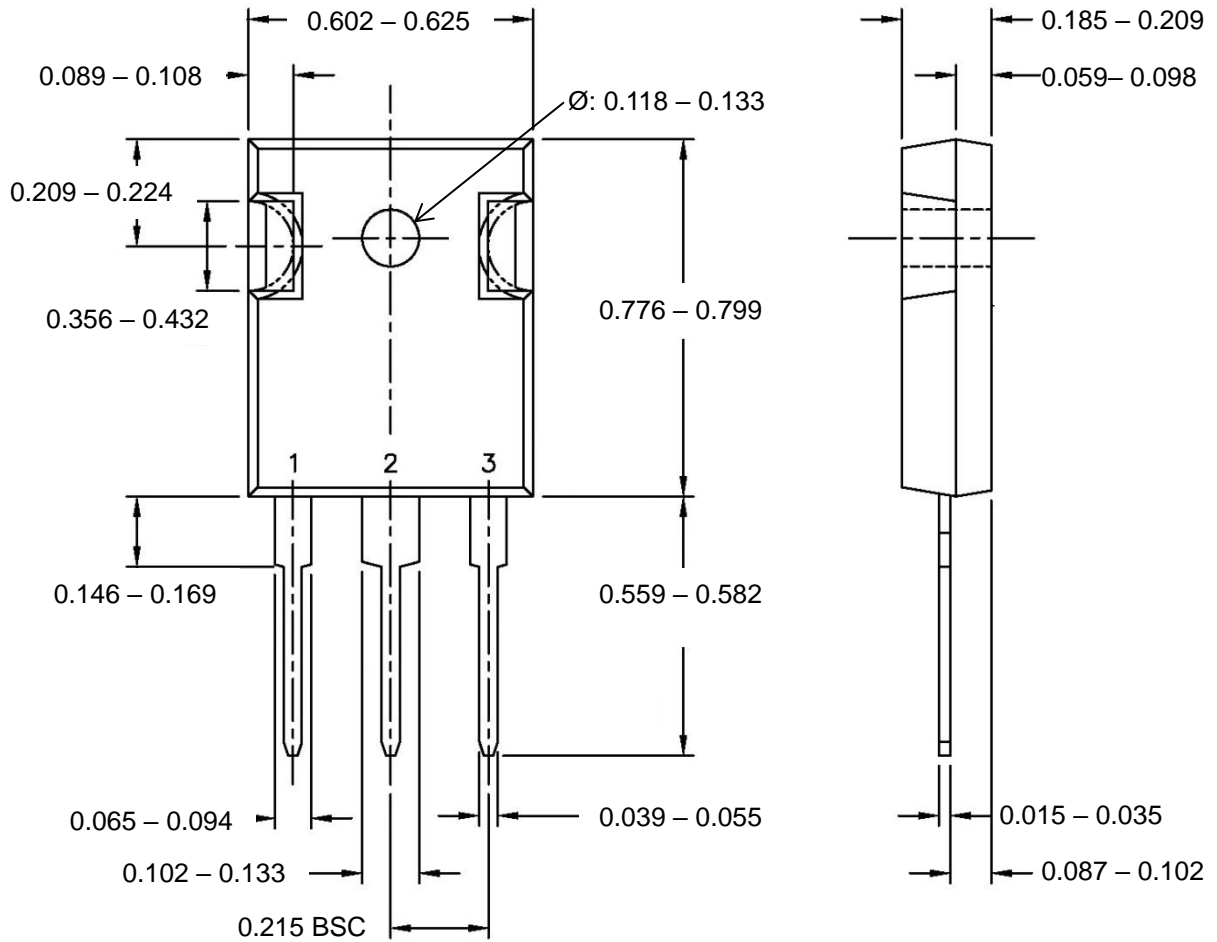
Note 3 Short Circuit < 1000 times, Short Circuit Interval: > 1s

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}	V _{GE} =15V, I _C =40A		1.8	2.3	V
		V _{GE} =15V, I _C =40A, T _J =150°C		2.3		
Diode Forward Voltage	V _F	V _{GE} =0V I _F =20A		1.8		V
		V _{GE} =0V I _F =20A, T _J =150°C		1.6		
Gate Threshold Voltage	V _{GE}	I _C =1mA, V _{CE} =V _{GE}	4	5.7	7	V
Collector Leakage Current	I _{CES}	V _{CE} =600V, V _{GE} =0V			1	mA
		V _{CE} =600V, V _{GE} =0V, T _J =150°C			4	
Gate Leakage Current	I _{GES}	V _{CE} =0V, V _{GE} =20V			250	nA
Transconductance	g _{FS}	V _{CE} =20V, I _C =40A		19.7		S
Dynamic Characteristic						
Input Capacitance	C _{ISS}	V _{CE} =25V, V _{GE} =0V, f=1MHz		3155		pF
Output Capacitance	C _{OSS}			175		pF
Reverse Transfer Capacitance	C _{RES}			81.5		pF
Gate Charge	Q _G	V _{CC} =480V, I _C =10A, V _{GE} =15V		165		nC
IGBT Switching Characteristic						
Turn ON Delay time	t _{D(ON)}	V _{CC} =400V, I _C =40A, V _{GE} =0/15V, R _G =10Ω, inductive load		36		ns
Rise Time	t _r			52		
Turn OFF delay time	t _{D(OFF)}			210		
Fall Time	t _f			62		mJ
Turn ON Energy Loss	E _{ON}			2.5		
Turn OFF Energy Loss	E _{OFF}			0.8		
Switching Energy Loss	E _{ts}		3.3			
Turn ON Delay time	t _{D(ON)}	V _{CC} =400V, I _C =40A, V _{GE} =0/15V, R _G =10Ω, inductive load, T _J =150°C		72		ns
Rise Time	t _r			71		
Turn OFF delay time	t _{D(OFF)}			300		
Fall Time	t _f			120		mJ
Turn ON Energy Loss	E _{ON}			2.8		
Turn OFF Energy Loss	E _{OFF}			1.3		
Switching Energy Loss	E _{ts}		4.1			
Diode Switching Characteristic						
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =20A, dI _F /dt = 600A/μs		41		ns
Reverse Recovery Charge	Q _{rr}			0.31		nC
Reverse Recovery Peak Current	I _{rrm}			13.3		A
Reverse Recovery Time	t _{rr}	V _R =400V, I _F =20A, dI _F /dt = 600A/μs, T _J =150°C		132		ns
Reverse Recovery Charge	Q _{rr}			1.12		nC
Reverse Recovery Peak Current	I _{rrm}			15		A

Package Dimension – TO247

Unit: Inches



Ordering Number

GM G 40R60M TD3 I

APM Gamma Micro	Product Category	Short Description	Package Type	Shipping Type
	Discrete IGBT	40: $I_C = 40A$ 60: $V_{CE} = 600V$	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)