- High breakdown voltage to 1200V for improved reliability
- Trench-Stop Technology offering :
  - High speed switching
  - High ruggedness, temperature stable
  - Short circuit withstand time – 10μs
  - Low V_{CEsat}
  - Easy parallel switching capability due to positive temperature coefficient in V_{CEsat}
- Enhanced avalanche capability

- Uninterruptible Power Supplies
- Solar inverter
- Welding
- PFC applications

Product	Package	Packaging
YGW40N120F1A1	TO247	Tube

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	1200	V
DC collector current, limited by T_{jmax} T_C = 25°C T_C = 100°C	I_C	80 40	A
Diode Forward current, limited by T_{jmax} T_C = 25°C T_C = 100°C	I_F	80 40	A
Continuous Gate-emitter voltage	V_{GE}	±20	V
Transient Gate-emitter voltage	V_{GE}	±30	V
Turn off safe operating area V_{CE} ≤1200V, T_j ≤ 150°C	-	160	A
Pulsed Collector Current, V_{GE} =15V, t_p limited by T_{jmax}	I_{CM}	160	A
Diode Pulsed Current, t_p limited by T_{jmax}	I_{Fpuls}	160	A
Short Circuit Withstand Time, V_{GE}= 15V, V_{CE}≤ 600V	T_{sc}	10	μs
Power dissipation , T_j=25°C	P_{tot}	417	W
Operating junction temperature	T_j	-40...+150	°C
Storage temperature	T_s	-55...+150	°C
Soldering temperature, wave soldering 1.6mm (0.063in.) from case for 10s	-	260	°C

Parameter	Symbol	Max. Value	Unit
IGBT thermal resistance, junction - case	R_{θ}(j-c)	0.3	K/W
Diode thermal resistance, junction - case	R_{θ}(j-c)	(j 0.7	K/W
Thermal resistance, junction - ambient	R_{θ}(j-a)	40	K/W

（T_j= 25℃ unless otherwise specified）：

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Collector-Emitter breakdown voltage	BV_{CES}	V_{GE}=0V , I_C=250μA	1200	1300	-	V
Gate threshold voltage	$V_{GE(th)}$	V_{GE}=V_{CE}, I_C=250μA	5.1	5.8	6.4	V
Collector-Emitter Saturation voltage	$V_{CE(sat)}$	V_{GE}=15V, I_C=40A T_j = 25°C T_j = 150°C	 - -	 2.0 2.5	 2.5 -	V
Zero gate voltage collector current	I_{CES}	V_{CE} = 1200V, V_{GE} = 0V T_j = 25°C T_j = 150°C	 - -	 - -	 10 2500	μA
Gate-emitter leakage current	I_{GES}	V_{CE} = 0V, V_{GE} = ± 20V	-	-	100	nA
Transconductance	g_{fs}	V_{CE}=20V, I_C=15A	-	15	-	S

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input capacitance	C_{ies}	V_{CE} = 25V, V_{GE} = 0V, f = 1MHz	-	4400	-	pF
Output capacitance	C_{oes}		-	180	-	
Reverse transfer capacitance	C_{res}		-	100	-	
Gate charge	Q_G	V_{CC} = 960V, I_C = 40A, V_{GE} = 15V	-	270	-	nC
Short circuit collector current	$I_{C(SC)}$	V_{GE}=15V,t_{SC}≤10us V_{CC}=600V, $T_{j,\ start}$=25°C	-	240	-	A

Parameter						
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Turn-on delay time	$td_{(on)}$	V_{CC} = 600V, I_C = 40A, V_{GE} = 0/15V, R_g=12Ω	-	60	-	ns
Rise time	t_r		-	27	-	ns
Turn-on energy	E_{on}		-	2.9	-	mJ
Turn-off delay time	$td_{(off)}$		-	230	-	ns
Fall time	t_f		-	70	-	ns
Turn-off energy	E_{off}		-	0.8	-	mJ

Fig. 5 Output characteristics

Fig. 6 Saturation voltage characteristics

Fig. 7 Switching times vs. gate resistor

Fig. 8 Switching times vs. collector current


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