

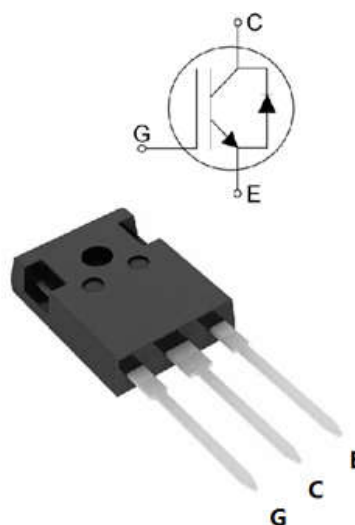
# YGW15N120T1

1200V /15A Trench Field Stop IGBT

## FEATURES

- High breakdown voltage to 1200V for improved reliability
- Trench-Stop Technology offering :
  - very tight parameter distribution
  - high ruggedness, temperature stable behavior
  - Short circuit withstand time – 10μs
  - High ruggedness, temperature stable
  - Low  $V_{CE(SAT)}$
  - Easy parallel switching capability due to positive temperature coefficient in  $V_{CE(SAT)}$
- Enhanced avalanche capability

$V_{CE}$	1200	V
$I_C$	15	A
$V_{CE(SAT)} I_C=15A$	1.7	V



## APPLICATION

- Frequency Converters
- Motor Drive

Product	Package	Packaging
YGW15N120T1	TO247	Tube

**Maximum Ratings**

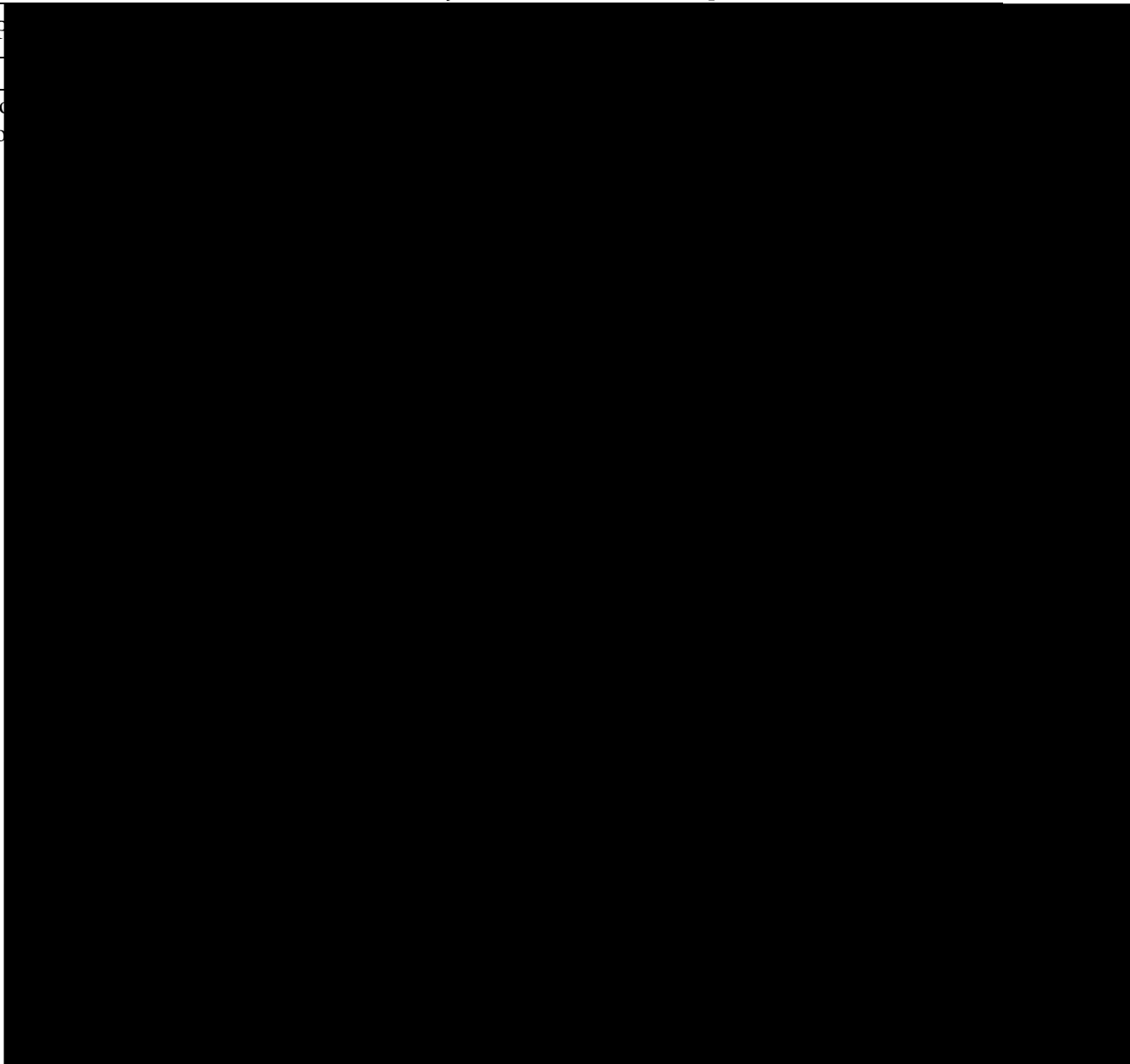
Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	$V_{CE}$	1200	V
DC collector current, limited by $T_{jmax}$ $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	$I_C$	30 15	A
Diode Forward current, limited by $T_{jmax}$ $T_C = 25^\circ\text{C}$ $T_C = 100^\circ\text{C}$	$I_F$	30 15	A
Continuous Gate-emitter voltage	$V_{GE}$	$\pm 20$	V
Transient Gate-emitter voltage	$V_{GE}$	$\pm 30$	V
Turn off safe operating area $V_{CE} \leq 1200\text{V}$ , $T_j \leq 150^\circ\text{C}$	-	60	A
Pulsed collector current, $V_{GE} = 15\text{V}$ , $t_p$ limited by $T_{jmax}$	$I_{CM}$	60	A
Short Circuit Withstand Time, $V_{GE} = 15\text{V}$ , $V_{CE} \leq 600\text{V}$	$T_{sc}$	10	$\mu\text{s}$
Power dissipation , $T_j = 25^\circ\text{C}$	$P_{tot}$	208	W
Operating junction temperature	$T_j$	-40...+150	$^\circ\text{C}$
Storage temperature	$T_s$	-55...+150	$^\circ\text{C}$
Soldering temperature, wave soldering 1.6mm (0.063in.) from case for 10s	-	260	$^\circ\text{C}$

**Thermal Resistance**

Parameter	Symbol	Max. Value	Unit
IGBT thermal resistance, junction - case	$R_{\theta(j-c)}$	0.65	K/W
Diode thermal resistance, junction - case	$R_{\theta(j-c)}$	1.5	K/W
Thermal resistance, junction - ambient	$R_{\theta(j)}$		

**Electrical Characteristics of the IGBT** ( $T_j = 25^\circ\text{C}$  unless otherwise specified) :

Static
Collector breakdown



**Switching Characteristic, Inductive Load**

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
<b>Dynamic , at <math>T_j = 25^\circ \text{C}</math></b>						

 Turn-on delay time       $t_{d(on)}$ 
 $V_{CC} = 600\text{V}, I_C = 15\text{A},$   
 $V_{GE} = 0/15\text{V},$   
 $R_g = 42$

Fig. 1 FBSOA characteristics

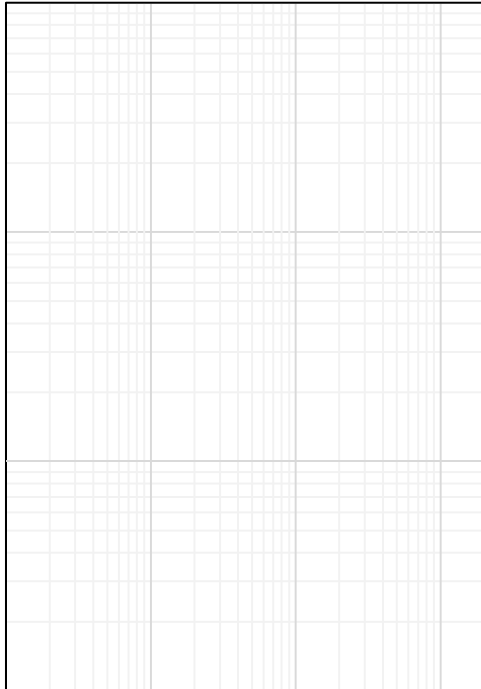


Fig. 2 Load Current vs. Frequency

Fig. 3 Output characteristics

Fig. 4 Saturation voltage characteristics

Fig. 5 Switching times vs. gate resistor

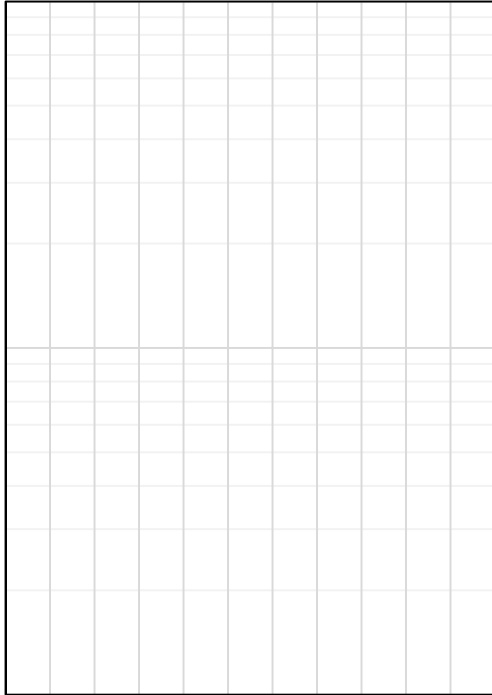


Fig. 6 Switching times vs. collector current

Fig. 7 Switching loss vs. gate resistor

Fig. 8 Switching loss vs. collector current

Fig. 9 Gate charge characteristics

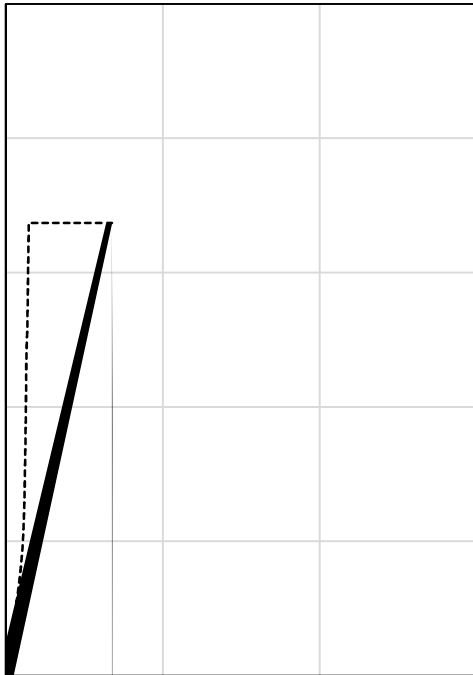
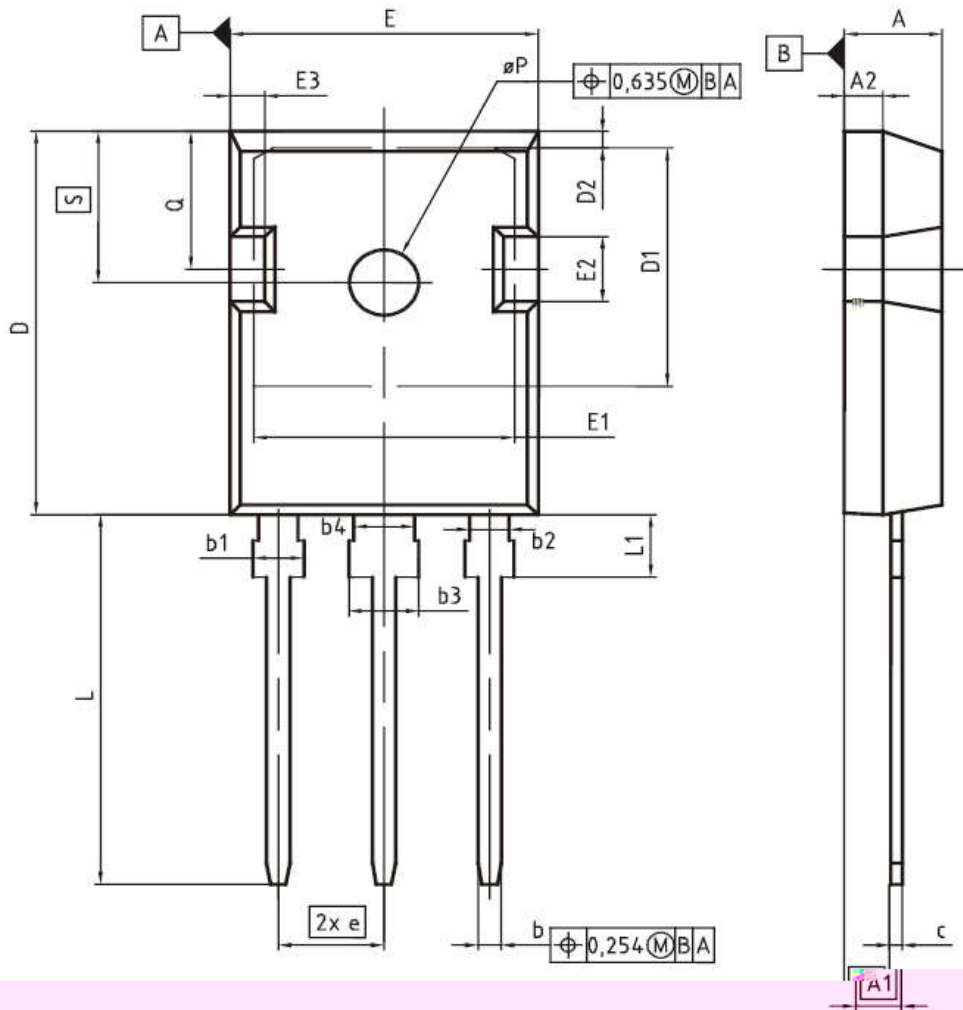


Fig. 10 Capacitance characteristics

**PG-TO247-3**


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.190	0.205
A1	2.27	2.54	0.089	0.100
A2	1.85	2.16	0.073	0.085
b	1.07	1.33	0.042	0.052
b1	1.90	2.41	0.075	0.095
b2	1.90	2.16	0.075	0.085
b3	2.87	3.38	0.113	0.133
b4	2.87	3.13	0.113	0.123
c	0.55	0.68	0.022	0.027
D	20.80	21.10	0.819	0.831
D1	16.50	17.50	0.650	0.689
D2	0.95	1.35	0.037	0.053
E	15.70	16.13	0.618	0.635
E1	13.70	14.10	0.516	0.557
E2	3.68	5.10	0.145	0.201
E3	1.00	2.60	0.039	0.102
e	5.44 (BSC)		0.214 (BSC)	
N	3		3	
L	19.80	20.32	0.780	0.800
L1	4.10	4.47	0.161	0.176
øP	3.50	3.70	0.138	0.146
Q	5.49	6.00	0.216	0.236
S	6.04	6.30	0.238	0.248