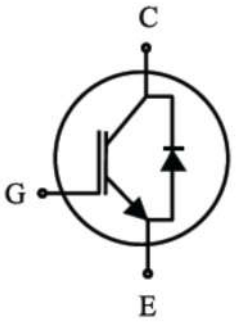
HG24N65F1A
650V 24A Trench FS IGBT

V_{CE}	650	V
I_C	24	A
$V_{CE(SAT)}$ I_C=24A	1.8	V

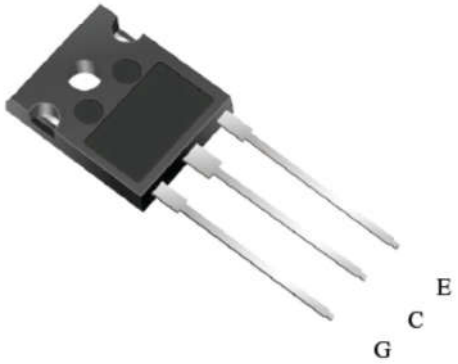
Features

- Max Junction Temperature 150°C
- High breakdown voltage up to 650V for improved reliability
- Short Circuit Rated
- Very Low Saturation Voltage:
  $V_{CE(SAT)}$ = 1.8V (Typ.) @ I_C = 24A
- Enhanced avalanche capability



Applications

- Uninterruptible Power Supplies
- Inverter
- Welding
- PFC applications



Product	Package	Packaging
HG24N65F1A	TO247	Tube

Maximum Ratings （T_j= 25℃ unless otherwise specified）

Parameter	Symbol	Value	Unit
Collector-Emitter Breakdown Voltage	V_{CE}	650	V
DC collector current, limited by $T_j$max T_C = 25°C T_C = 100°C	I_C	 48 24	A
Diode Forward current, limited by $T_j$max T_C = 25°C T_C = 100°C	I_F	 48 24	A
Turn off safe operating area V_{CE} ≤650V, T_j ≤ 150°C		80	A
Short Circuit Withstand Time, V_{GE}= 15V, V_{CE}≤ 400V	T_{sc}	5	μs
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

Thermal Resistance

Parameter	Symbol	Max. Value	Unit
IGBT thermal resistance, junction - case	R_{θ}(j-c)	0.85	K/W
Diode thermal resistance, junction - case	R_{θ}(j-c)	1.3	K/W
Thermal resistance, junction - ambient	R_{θ}(j-a)	40	K/W

Electrical Characteristics of the IGBT (T_J = 25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
Static Characteristics (Tested on wafers)						
BV_{CES}	Collector to Emitter Breakdown Voltage	V_{GE} = 0V, I_C = 1mA	650	-	-	V
$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	I_C = 24A, V_{GE} = 15V	-	1.8	2.1	V
$V_{GE(th)}$	G-E Threshold Voltage	V_{GE} = V_{CE}, I_C = 250μA	4.1	5.0	5.7	V
I_{CES}	Collector Cut-Off Current	V_{CE} = 650V, V_{GE} = 0V	-	-	40	μA
I_{GES}	G-E Leakage Current	V_{GE} = 20V, V_{CE} = 0V	-	-	±100	nA

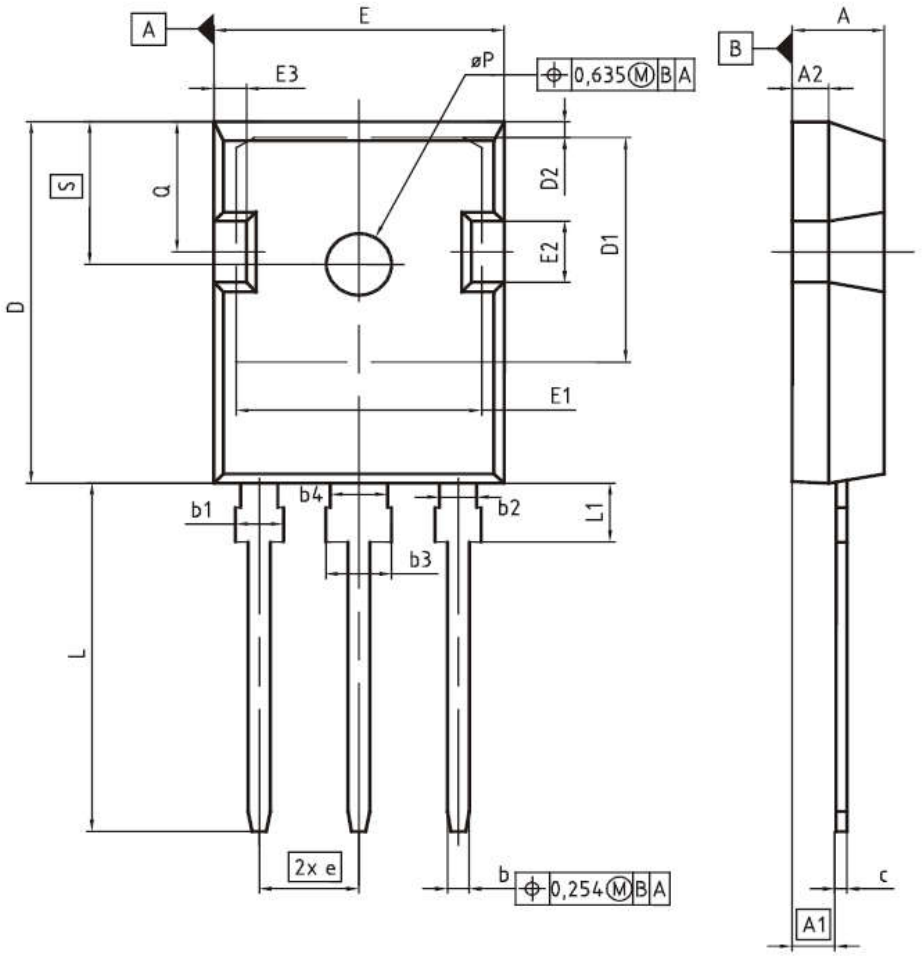
Switching Characteristic, Inductive Load （T_j= 25℃ unless otherwise specified）

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Dynamic T_j=25°C						
Turn-on Delay Time	$t_{d(on)}$	T_j=25°C V_{CC} = 400V, I_C = 24A, V_{GE} = 0/15V, Rg=12Ω	-	30	-	ns
Rise Time	t_r		-	20	-	ns
Turn-off Delay Time	$t_{d(off)}$		-	100	-	ns
Fall Time	t_f		-	80	-	ns
Turn-on Energy	E_{on}		-	1.1	-	mJ
Turn-off Energy	E_{off}		-	0.15	-	mJ

Electrical Characteristics of the DIODE （T_j= 25℃ unless otherwise specified）

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Dynamic						
Diode Forward Voltage	V_{FM}	I_F = 30A	-	1.6	-	V

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	16.25	17.65	0.640	0.695
D2	0.95	1.35	0.037	0.053
E	15.70	16.13	0.618	0.635
E1	13.10	14.15	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