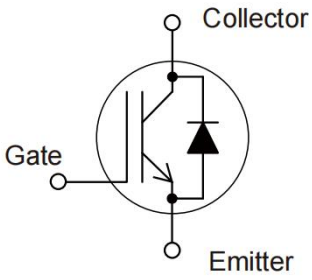
Features:

- Low Switching Power Loss
- Low Switching Surge And Noise
- Advanced Field Stop Technology
- Low EMI
- Maximum Junction Temperature 175°C
- Qualified According To JEDEC For Target Applications
- Pb-free Lead Plating, Halogen-free Mold Compound, RoHS Compliant

Applications:

- Industrial UPS
- Welding Machine
- Solar Converters
- Energy Storage
- EV Charger



Key Performance and Package Parameters

Type	V_{CE}	I_C	V_{CEsat}, T_{vj}=25°C	T_{vjmax}	Marking	Package
IRG4PF50WPBF	900V	30A	1.65 V	175°C	CI30T90X	TO247-3L

Maximum Ratings and Characteristics

Absolute Maximum Ratings at T_{vj}= 25°C (unless otherwise specified)

Items	Symbols	Value	Units
Collector-emitter voltage	V_{CES}	900	V
Gate-emitter voltage Transient gate-emitter voltage (t_p≤ 10µs, D< 0.010)	V_{GES}	±20 ±30	V
DC collector current, limited by T_{vjmax} T_C= 25°C T_C= 100°C	I_C	 60 30	A
Pulsed collector current, t_p limited by T_{vjmax}	I_{CP}	120	A
Diode forward current, limited by T_{vjmax} T_C= 25°C T_C= 100°C	I_F	 60 30	A
Diode Pulsed collector current, t_p limited by T_{vjmax}	I_{FP}	120	A
Operating junction temperature	T_{vj}	-40 ~ +175	°C
Storage temperature	T_{stg}	-55 ~ +175	°C

Electrical Characteristics at T_{vj}= 25°C (unless otherwise specified)

Description	Symbols	Conditions	Characteristics			Unit
			Min	Typ	Max	
Collector-emitter breakdown voltage	$V_{(BR)CES}$	V_{GE}= 0V, I_C= 0.25mA	900	-	-	V
Zero gate voltage collector current	I_{CES}	V_{CE}= 1000V, V_{GE}= 0V	-	-	200	μA
Gate-emitter leakage current	I_{GES}	V_{CE}= 0V, V_{GE}= ±20V	-	-	±200	nA
Gate-emitter threshold voltage	$V_{GE(th)}$	V_{CE}= V_{GE}, I_C= 250μA	5.0	5.5	6.0	V
Collector-emitter saturation voltage	$V_{CE(sat)}$	V_{GE}= 15V, I_C= 40A T_{vj}= 25°C T_{vj}= 175°C	 - -	 1.65 2.4	 2.25 	V
Input capacitance	C_{ies}	V_{CE}= 25V, V_{GE}= 0V f= 1MHz	-	9467	-	pF
Output capacitance	C_{oes}		-	132	-	pF
Reverse transfer capacitance	C_{res}		-	65	-	pF
Gate charge	Q_G	V_{CC}= 960V, I_C= 40A, V_{GE}= 15V	-	315	-	nC
Forward voltage drop	V_F	I_F= 20A T_{vj}= 25°C T_{vj}= 175°C	 - -	 1.9 1.87	 3.0 	V

Switching Characteristics at T_{vj}= 25°C

Description	Symbols	Conditions	Characteristics			Unit
			Min	Typ	Max	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{CC}= 720V I_C= 28A V_{GE}= 15V R_G= 5Ω Inductive load	-	80	-	ns
Rise time	t_r		-	22	-	ns
Turn-off delay time	$t_{d(off)}$		-	173	-	ns
Fall time	t_f		-	206	-	ns
Turn-on energy	E_{on}		-	2.0	-	mJ
Turn-off energy	E_{off}		-	0.8	-	mJ
Total switching energy	E_{ts}		-	2.8	-	mJ
Diode Characteristics						
Diode reverse recovery time	t_{rr}	V_{CC}= 720V I_F= 20A di_F/dt= 1900A/μs	-	37	-	ns
Diode reverse recovery charge	Q_{rr}		-	0.9	-	μC
Diode peak reverse recovery current	I_{rrm}		-	45	-	A

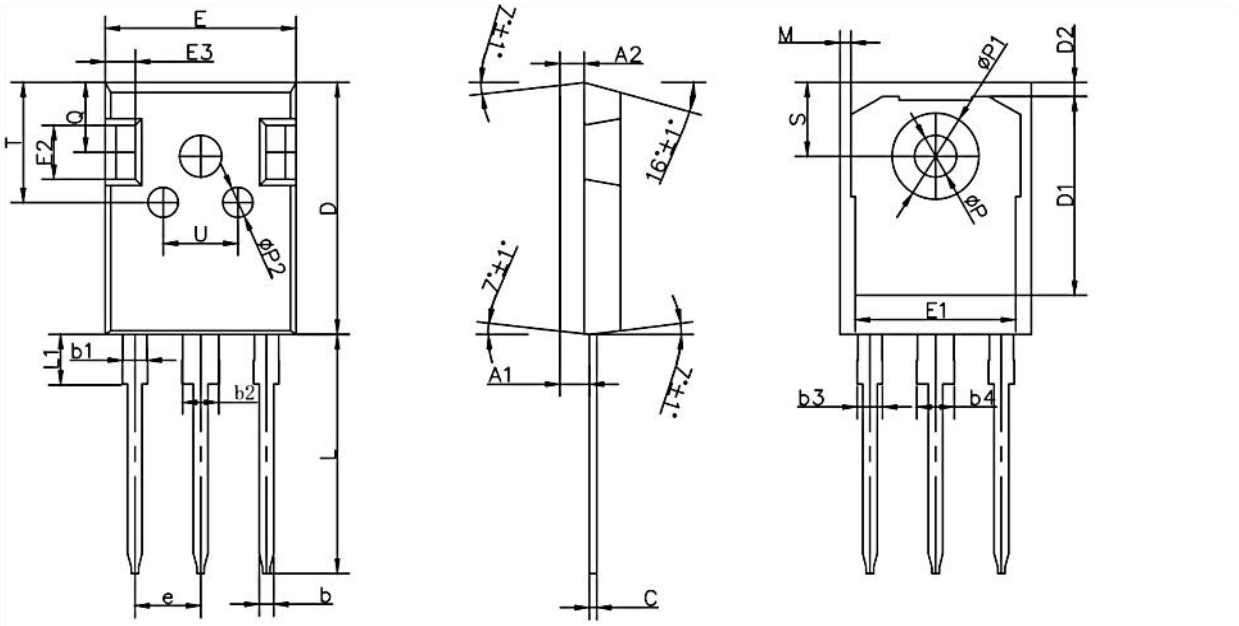
Switching Characteristics at T_{vj}= 175°C

Description	Symbols	Conditions	Characteristics			Unit
			Min	Typ	Max	
IGBT Characteristics						
Turn-on delay time	$t_{d(on)}$	V_{CC}= 720V I_C= 28A V_{GE}= 15V R_G= 5Ω Inductive load	-	90	-	ns
Rise time	t_r		-	30	-	ns
Turn-off delay time	$t_{d(off)}$		-	186	-	ns
Fall time	t_f		-	223	-	ns
Turn-on energy	E_{on}		-	2.2	-	mJ
Turn-off energy	E_{off}		-	1.0	-	mJ
Total switching energy	E_{ts}		-	3.2	-	mJ
Diode Characteristics						
Diode reverse recovery time	t_{rr}	V_{CC}= 720V I_F= 20A di_F/dt= 1900A/μs	-	75	-	ns
Diode reverse recovery charge	Q_{rr}		-	3.7	-	μC
Diode peak reverse recovery current	I_{rrm}		-	70	-	A

Thermal Resistance

Items	Symbols	Characteristics			Unit
		Min	Typ	Max	
Thermal resistance, junction-ambient	$R_{th(j-a)}$	-	-	50	°C /W
Thermal resistance, IGBT junction to case	$R_{th(j-c)}$	-	-	0.29	
Thermal resistance, diodes junction to case	$R_{th(j-c)}$	-	-	0.44	

TO247-3L Package Outline



TO247-3L			
DIM.	MIN.	NOM.	MAX.
A	4.90	5.00	5.10
A1	2.25	2.36	2.51
A2	1.90	2.00	2.10
b	1.16	1.20	1.26
b1	1.96	2.00	2.06
b2	2.96	3.00	3.06
b3	–	–	2.25
b4	–	–	3.25
c	0.59	0.60	0.66
D	20.90	21.00	21.10
D1	16.25	16.55	16.85
D2	1.05	1.17	1.35
E	15.70	15.80	15.90
E1	13.10	13.26	13.50
E2	4.40	4.50	4.60
E3	2.40	2.50	2.60
e	5.436BSC		
L	19.80	19.90	20.10
L1	–	–	4.30
M	0.35	0.89	0.95
P	3.40	3.50	3.60
P1	7.00	7.20	7.40
P2	2.40	2.50	2.60
Q	5.60	5.80	6.00
S	6.05	6.15	6.25
T	9.80	10.00	10.20
U	6.00	6.20	6.40
All dimensions in millimeters			

NOTICE

The information presented in this document is for reference only. Involving product optimization and productivity improvement, ChipNobo reserves the right to adjust product indicators and upgrade some technical parameters. ChipNobo is entitled to be exempted from liability for any delay or non-delivery of the information disclosure process that occurs.
本文件中提供的信息仅供参考。涉及产品优化和生产效率改善，ChipNobo 有权调整产品指标和部分技术参数的升级，所出现信息披露过程存在延后或者不能送达的情形，ChipNobo 有获免责权。

The product listed herein is designed to be used with residential and commercial equipment, and do not support sensitive items and specialized equipment in areas where sanctions do exist. ChipNobo Co., Ltd or anyone on its behalf, assumes no responsibility or liability for any damages resulting from improper use.
此处列出的产品旨在民用和商业设备上使用，不支持确有制裁地区的敏感项目和特殊设备，ChipNobo 有限公司或其代表，对因不当使用而造成的任何损害不承担任何责任。

For additional information, please visit our website https://www.chipnobo.com/en or consult your nearest Chipnobo sales office for further assistance.
欲了解更多信息，请访问我们的网站 https://www.chipnobo.com/en，或咨询离您最近的 Chipnobo 销售办事处以获得进一步帮助。