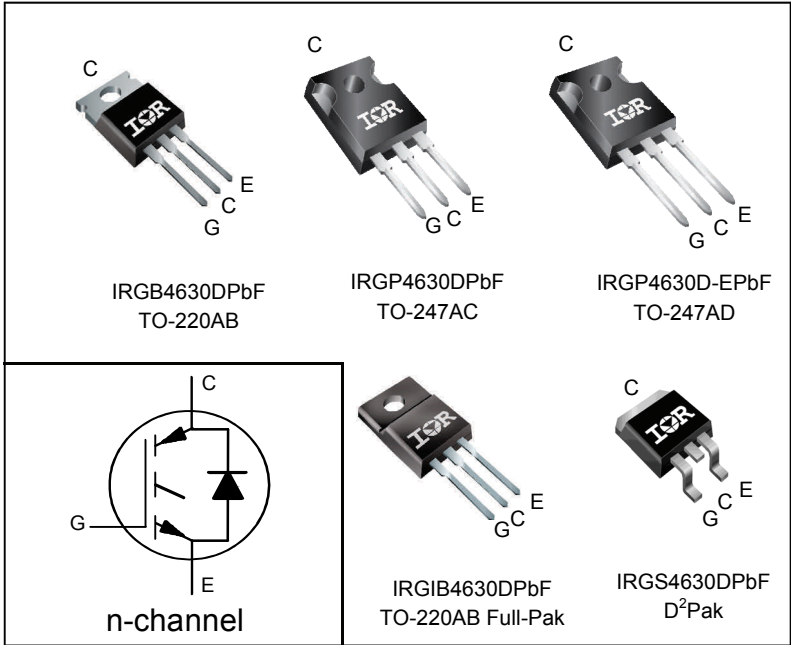


Insulated Gate Bipolar Transistor with Ultrafast Soft Recovery Diode

$V_{CES} = 600V$
$I_C = 30A, T_C = 100^\circ C$
$t_{SC} \geq 5\mu s, T_{J(max)} = 175^\circ C$
$V_{CE(ON)} \text{ typ.} = 1.65V @ I_C = 18A$



Applications

- Industrial Motor Drive
- Inverters
- UPS
- Welding

G	C	E
Gate	Collector	Emitter

Features	Benefits
Low $V_{CE(ON)}$ and switching losses	High efficiency in a wide range of applications and switching frequencies
Square RBSOA and maximum junction temperature $175^\circ C$	Improved reliability due to rugged hard switching performance and high power capability
Positive $V_{CE(ON)}$ temperature coefficient and tight distribution of parameters	Excellent current sharing in parallel operation
$5\mu s$ Short Circuit SOA	Enables short circuit protection scheme
Lead-Free, RoHS Compliant	Environmentally friendly

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRGB4630DPbF	TO-220AB	Tube	50	IRGB4630DPbF
IRGIB4630DPbF	TO-220AB Full-Pak	Tube	50	IRGIB4630DPbF
IRGP4630DPbF	TO-247AC	Tube	25	IRGP4630DPbF
IRGP4630D-EPbF	TO-247AD	Tube	25	IRGP4630D-EPbF
IRGS4630DPbF	D ² Pak	Tube	50	IRGS4630DPbF
		Tape and Reel Right	800	IRGS4630DTRRPbF
		Tape and Reel Left	800	IRGS4630DTRLpbF

Absolute Maximum Ratings

	Parameter	Max.	Units
V_{CES}	Collector-to-Emitter Voltage	600	V
$I_C @ T_C = 25^\circ\text{C}$	Continuous Collector Current①	47	A
$I_C @ T_C = 100^\circ\text{C}$	Continuous Collector Current①	30	
I_{CM}	Pulse Collector Current, $V_{GE}=15\text{V}$ ④	54	
I_{LM}	Clamped Inductive Load Current, $V_{GE}=20\text{V}$ ⑦	72	
$I_F @ T_C = 25^\circ\text{C}$	Diode Continuous Forward Current①	30	
$I_F @ T_C = 100^\circ\text{C}$	Diode Continuous Forward Current①	18	
I_{FM}	Diode Maximum Forward Current ④	72	
V_{GE}	Continuous Gate-to-Emitter Voltage	± 20	V
	Transient Gate to Emitter Voltage	± 30	
$P_D @ T_C = 25^\circ\text{C}$	Maximum Power Dissipation	206	W
$P_D @ T_C = 100^\circ\text{C}$	Maximum Power Dissipation	103	
T_J T_{STG}	Operating Junction and Storage Temperature Range	-40 to +175	C
	Soldering Temperature, for 10 sec. (1.6mm from case)	300	
	Mounting Torque, 6-32 or M3 Screw (TO-220, TO-247)	10 lbf-in (1.1 N·m)	

Thermal Resistance

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$ (IGBT)②	Thermal Resistance Junction-to-Case (D ² Pak, TO-220)	—	—	0.73	°C/W
	Thermal Resistance Junction-to-Case (TO-220 Full-Pak)	—	—	3.4	
	Thermal Resistance Junction-to-Case (TO-247)	—	—	0.78	
$R_{\theta JC}$ (Diode)②	Thermal Resistance Junction-to-Case (D ² Pak, TO-220)	—	—	2.0	
	Thermal Resistance Junction-to-Case (TO-220 Full-Pak)	—	—	4.6	
	Thermal Resistance Junction-to-Case (TO-247)	—	—	2.1	
$R_{\theta CS}$	Thermal Resistance, Case-to-Sink (flat, greased surface-TO-220, D ² Pak, TO-220 Full-Pak)	—	0.5	—	
	Thermal Resistance Case-to-Sink (TO-247)	—	0.24	—	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (PCB Mount - D ² Pak) ⑥	—	—	40	
	Thermal Resistance, Junction-to-Ambient (Socket Mount –TO-220)	—	—	62	
	Thermal Resistance, Junction-to-Ambient (Socket Mount –TO-247)	—	—	40	
	Thermal Resistance, Junction-to-Ambient (Socket Mount –TO-220 Full-Pak)	—	—	65	

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	600	—	—	V	$V_{GE} = 0\text{V}$, $I_C = 100\mu\text{A}$ ③
$\Delta V_{(BR)CES}/\Delta T_J$	Temperature Coeff. of Breakdown Voltage	—	0.40	—	V/°C	$V_{GE} = 0\text{V}$, $I_C = 1\text{mA}$ (25°C-175°C)
$V_{CE(on)}$	Collector-to-Emitter Saturation Voltage	—	1.65	1.95	V	$I_C = 18\text{A}$, $V_{GE} = 15\text{V}$, $T_J = 25^\circ\text{C}$
		—	2.05	—		$I_C = 18\text{A}$, $V_{GE} = 15\text{V}$, $T_J = 150^\circ\text{C}$
		—	2.15	—		$I_C = 18\text{A}$, $V_{GE} = 15\text{V}$, $T_J = 175^\circ\text{C}$
$V_{GE(th)}$	Gate Threshold Voltage	4.0	—	6.5	V	$V_{CE} = V_{GE}$, $I_C = 500\mu\text{A}$
$\Delta V_{GE(th)}/\Delta T_J$	Threshold Voltage Temp. Coefficient	—	-18	—	mV/°C	$V_{CE} = V_{GE}$, $I_C = 1.0\text{mA}$ (25°C-175°C)
g_{fe}	Forward Transconductance	—	12	—	S	$V_{CE} = 50\text{V}$, $I_C = 18\text{A}$, $PW = 80\mu\text{s}$
I_{CES}	Collector-to-Emitter Leakage Current	—	2.0	25	μA	$V_{GE} = 0\text{V}$, $V_{CE} = 600\text{V}$
		—	550	—		$V_{GE} = 0\text{V}$, $V_{CE} = 600\text{V}$, $T_J = 175^\circ\text{C}$
I_{GES}	Gate-to-Emitter Leakage Current	—	—	± 100	nA	$V_{GE} = \pm 20\text{V}$
V_{FM}	Diode Forward Voltage Drop	—	2.3	3.3	V	$I_F = 18\text{A}$
		—	1.6	—		$I_F = 18\text{A}$, $T_J = 175^\circ\text{C}$