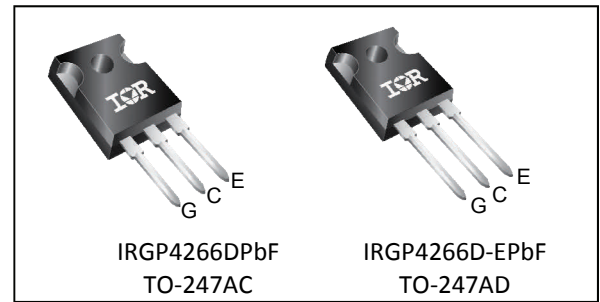
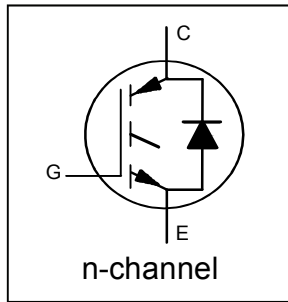


$V_{CES} = 650V$
$I_C = 90A, T_C = 100^\circ C$
$t_{SC} \geq 5.5\mu s, T_{J(max)} = 175^\circ C$
$V_{CE(ON)} \text{ typ.} = 1.7V @ I_C = 75A$

**Insulated Gate Bipolar Transistor with Ultrafast Soft Recovery Diode**



G	C	E
Gate	Collector	Emitter

**Applications**

- Industrial Motor Drive
- UPS
- Solar Inverters
- Welding

Features	Benefits
Low $V_{CE(ON)}$ and Switching Losses	High Efficiency in a Wide Range of Applications
5.5 $\mu s$ Short Circuit SOA	Rugged Transient Performance
Square RBSOA	Increased Reliability
Maximum Junction Temperature 175 $^\circ C$	Excellent Current Sharing in Parallel Operation
Positive $V_{CE(ON)}$ Temperature Co-efficient	

Base part number	Package Type	Standard Pack		Orderable Part Number
		Form	Quantity	
IRGP4266DPbF	TO-247AC	Tube	25	IRGP4266DPbF
IRGP4266D-EPbF	TO-247AD	Tube	25	IRGP4266D-EPbF

**Absolute Maximum Ratings**

	Parameter	Max.	Units
$V_{CES}$	Collector-to-Emitter Voltage	650	V
$I_C @ T_C = 25^\circ C$	Continuous Collector Current	140	A
$I_C @ T_C = 100^\circ C$	Continuous Collector Current	90	
$I_{CM}$	Pulse Collector Current, $V_{GE}=20V$	300	
$I_{LM}$	Clamped Inductive Load Current, $V_{GE}=20V$ ①	300	
$I_F @ T_C = 25^\circ C$	Diode Continuous Forward Current	68	
$I_F @ T_C = 100^\circ C$	Diode Continuous Forward Current	42	
$V_{GE}$	Continuous Gate-to-Emitter Voltage	$\pm 20$	V
$P_D @ T_C = 25^\circ C$	Maximum Power Dissipation	455	W
$P_D @ T_C = 100^\circ C$	Maximum Power Dissipation	230	
$T_J$	Operating Junction and Storage Temperature Range	-40 to +175	C
$T_{STG}$	Soldering Temperature, for 10 sec.	300 (0.063 in. (1.6mm) from case)	
	Mounting Torque, 6-32 or M3 Screw	10 lbf·in (1.1 N·m)	

**Thermal Resistance**

	Parameter	Min.	Typ.	Max.	Units
$R_{\theta JC}$ (IGBT)	Thermal Resistance Junction-to-Case-(each IGBT) ②	—	—	0.33	$^\circ C/W$
$R_{\theta JC}$ (Diode)	Thermal Resistance Junction-to-Case-(each Diode) ②	—	—	1.1	
$R_{\theta CS}$	Thermal Resistance, Case-to-Sink (flat, greased surface)	—	0.24	—	
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (typical socket mount)	—	40	—	

**Electrical Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter	Min.	Typ.	Max.	Units	Conditions
V <sub>(BR)CES</sub>	Collector-to-Emitter Breakdown Voltage	650	—	—	V	V <sub>GE</sub> = 0V, I <sub>C</sub> = 100μA ③
ΔV <sub>(BR)CES/ΔT<sub>J</sub></sub>	Temperature Coeff. of Breakdown Voltage	—	0.65	—	V/°C	V <sub>GE</sub> = 0V, I <sub>C</sub> = 5.0mA (25°C-175°C)
V <sub>CE(on)</sub>	Collector-to-Emitter Saturation Voltage	—	1.7	2.1	V	I <sub>C</sub> = 75A, V <sub>GE</sub> = 15V, T <sub>J</sub> = 25°C
		—	2.2	—		I <sub>C</sub> = 75A, V <sub>GE</sub> = 15V, T <sub>J</sub> = 175°C
V <sub>GE(th)</sub>	Gate Threshold Voltage	5.5	—	7.7	V	V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> = 2.1mA
ΔV <sub>GE(th)/ΔT<sub>J</sub></sub>	Threshold Voltage Temperature Coeff.	—	-20	—	mV/°C	V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> = 2.1mA (25°C-150°C)
g <sub>fe</sub>	Forward Transconductance	—	47	—	S	V <sub>CE</sub> = 50V, I <sub>C</sub> = 75A, PW = 20μs
I <sub>CES</sub>	Collector-to-Emitter Leakage Current	—	1.0	35	μA	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 650V
		—	1.0	—	mA	V <sub>GE</sub> = 0V, V <sub>CE</sub> = 650V, T <sub>J</sub> = 175°C
I <sub>GES</sub>	Gate-to-Emitter Leakage Current	—	—	±100	nA	V <sub>GE</sub> = ±20V
V <sub>F</sub>	Diode Forward Voltage Drop	—	2.1	2.7	V	I <sub>F</sub> = 75A
		—	1.7	—		I <sub>F</sub> = 75A, T <sub>J</sub> = 175°C

**Switching Characteristics @ T<sub>J</sub> = 25°C (unless otherwise specified)**

	Parameter	Min.	Typ.	Max <sup>④</sup>	Units	Conditions
Q <sub>g</sub>	Total Gate Charge (turn-on)	—	140	210	nC	I <sub>C</sub> = 75A
Q <sub>ge</sub>	Gate-to-Emitter Charge (turn-on)	—	50	80		V <sub>GE</sub> = 15V
Q <sub>gc</sub>	Gate-to-Collector Charge (turn-on)	—	60	90		V <sub>CC</sub> = 400V
E <sub>on</sub>	Turn-On Switching Loss	—	2.5	3.4	mJ	I <sub>C</sub> = 75A, V <sub>CC</sub> = 400V, V <sub>GE</sub> = 15V R <sub>G</sub> = 10Ω, L = 200μH, T <sub>J</sub> = 25°C
E <sub>off</sub>	Turn-Off Switching Loss	—	2.2	3.0		
E <sub>total</sub>	Total Switching Loss	—	4.7	6.4		
t <sub>d(on)</sub>	Turn-On delay time	—	50	70	ns	Energy losses include tail & diode reverse recovery ⑤⑥
t <sub>r</sub>	Rise time	—	70	90		
t <sub>d(off)</sub>	Turn-Off delay time	—	200	225		
t <sub>f</sub>	Fall time	—	60	80		
E <sub>on</sub>	Turn-On Switching Loss	—	3.9	—	mJ	I <sub>C</sub> = 75A, V <sub>CC</sub> = 400V, V <sub>GE</sub> = 15V R <sub>G</sub> = 10Ω, L = 200μH, T <sub>J</sub> = 175°C
E <sub>off</sub>	Turn-Off Switching Loss	—	2.8	—		
E <sub>total</sub>	Total Switching Loss	—	6.7	—		
t <sub>d(on)</sub>	Turn-On delay time	—	50	—	ns	Energy losses include tail & diode reverse recovery ⑤⑥
t <sub>r</sub>	Rise time	—	70	—		
t <sub>d(off)</sub>	Turn-Off delay time	—	240	—		
t <sub>f</sub>	Fall time	—	70	—		
C <sub>ies</sub>	Input Capacitance	—	4430	—	pF	V <sub>GE</sub> = 0V V <sub>CC</sub> = 30V f = 1.0MHz
C <sub>oes</sub>	Output Capacitance	—	310	—		
C <sub>res</sub>	Reverse Transfer Capacitance	—	130	—		
RBSOA	Reverse Bias Safe Operating Area	FULL SQUARE				T <sub>J</sub> = 175°C, I <sub>C</sub> = 225A V <sub>CC</sub> = 480V, V <sub>p</sub> ≤ 650V R <sub>g</sub> = 50Ω, V <sub>GE</sub> = +20V to 0V
SCSOA	Short Circuit Safe Operating Area	5.5	—	—	μs	T <sub>J</sub> = 150°C, V <sub>CC</sub> = 400V, V <sub>p</sub> ≤ 650V R <sub>g</sub> = 50Ω, V <sub>GE</sub> = +15V to 0V
E <sub>rec</sub>	Reverse Recovery Energy of the Diode	—	770	—	μJ	T <sub>J</sub> = 175°C
t <sub>rr</sub>	Diode Reverse Recovery Time	—	170	—	ns	V <sub>CC</sub> = 400V, I <sub>F</sub> = 75A
I <sub>rr</sub>	Peak Reverse Recovery Current	—	27	—	A	V <sub>GE</sub> = 15V, R <sub>g</sub> = 10Ω

**Notes:**

- ① V<sub>CC</sub> = 80% (V<sub>CES</sub>), V<sub>GE</sub> = 20V.
- ② R<sub>θ</sub> is measured at T<sub>J</sub> of approximately 90°C.
- ③ Refer to AN-1086 for guidelines for measuring V<sub>(BR)CES</sub> safely.
- ④ Maximum limits are based on statistical sample size characterization.
- ⑤ Pulse width limited by max. junction temperature.
- ⑥ Values influenced by parasitic L and C in measurement.