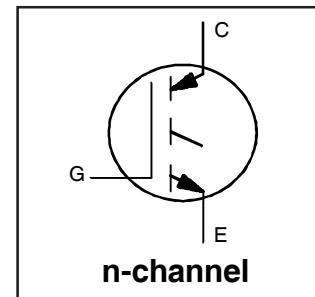


IRG7C350UB-R

Features

- Low $V_{CE(ON)}$ and switching losses
- Zero $V_{CE(ON)}$ temperature coefficient
- Square RBSOA



Benefits

- High Efficiency in a wide range of applications
- Rugged transient performance
- Low EMI

Applications

- Uninterruptible Power Supplies
- Battery operated vehicles
- Welding
- Solar converters and inverters

Chip Type	V_{CE}	I_{Cn}	Die Size	Package
IRG7C350UB-R	330V	75A	6.08 x 6.07 mm ²	Wafer

Mechanical Parameter

Die Size	6.08 x 6.07	mm ²
Minimum Street Width	75	μm
Emitter Pad Size (Included Gate Pad)	See Die Drawing	mm ²
Gate Pad Size	0.7 x 1.7	
Area Total / Active	36.89/27.56	
Thickness	200	μm
Wafer Size	150	mm
Flat Position	0	Degrees
Maximum-Possible Chips per Wafer	391 pcs	
Passivation Frontside	Silicon Nitride	
Front Metal	Al, Si (4μm)	
Backside Metal	Al- Ti - Ni- Ag (1kA°-1kA°-4kA°-6kA°)	
Die Bond	Electrically conductive epoxy or solder	
Reject Ink Dot Size	0.25 mm diameter minimum	
Recommended Storage Environment	Store in original container, in dry Nitrogen, <6 months at an ambient temperature of 23°C	

Maximum Ratings

	Parameter	Max.	Units
V_{CE}	Collector-Emitter Voltage, $T_J = 25^\circ\text{C}$	330	V
I_C	DC Collector Current	①	A
I_{LM}	Clamped Inductive Load Current ③	300	A
V_{GE}	Gate Emitter Voltage	± 30	V
T_J, T_{STG}	Operating Junction and Storage Temperature	-40 to +150	$^\circ\text{C}$

Static Characteristics (Tested on wafers) . $T_J = 25^\circ\text{C}$

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	330	---	---	V	$V_{GE} = 0\text{V}, I_C = 250\mu\text{A}$
$V_{CE(sat)}$	Collector-to-Emitter Saturated Voltage	---	1.0	1.2		$V_{GE} = 15\text{V}, I_C = 16\text{A}, T_J = 25^\circ\text{C}$
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	2.2	---	4.7		$I_C = 8\text{mA}, V_{GE} = V_{CE}$
I_{CES}	Zero Gate Voltage Collector Current	---	1.0	60	μA	$V_{CE} = 330\text{V}, V_{GE} = 0\text{V}$
I_{GES}	Gate Emitter Leakage Current	---	---	± 200	nA	$V_{CE} = 0\text{V}, V_{GE} = 30\text{V}$
$R_{G\text{INTERNAL}}$	Internal Gate Resistance	4.5	6.0	7.5	Ω	

Electrical Characteristics (Not subject to production test- Verified by design/characterization)

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{CE(sat)}$	Collector-to-Emitter Saturated Voltage	---	1.1	1.3	V	$V_{GE} = 15\text{V}, I_C = 75\text{A}, T_J = 25^\circ\text{C}$ ⑤
		---	1.1	---		$V_{GE} = 15\text{V}, I_C = 75\text{A}, T_J = 150^\circ\text{C}$ ⑤
RBSOA	Reverse Bias Safe Operating Area	FULL SQUARE				$T_J = 150^\circ\text{C}, I_C = 300\text{A}$ $V_{CC} = 264\text{V}, V_p \leq 300\text{V}$ $R_g = 5\Omega, V_{GE} = +20\text{V to } 0\text{V}$
C_{iss}	Input Capacitance	---	5985	---	pF	$V_{GE} = 0\text{V}$
C_{oss}	Output Capacitance	---	305	---		$V_{CE} = 30\text{V}$
C_{riss}	Reverse Transfer Capacitance	---	180	---		$f = 1.0\text{MHz},$
Q_g	Total Gate Charge (turn-on)	---	250	---	nC	$I_C = 75\text{A}$ ④
Q_{ge}	Gate-to-Emitter Charge (turn-on)	---	40	---		$V_{GE} = 15\text{V}$
Q_{gc}	Gate-to-Collector Charge (turn-on)	---	90	---		$V_{CC} = 240\text{V}$

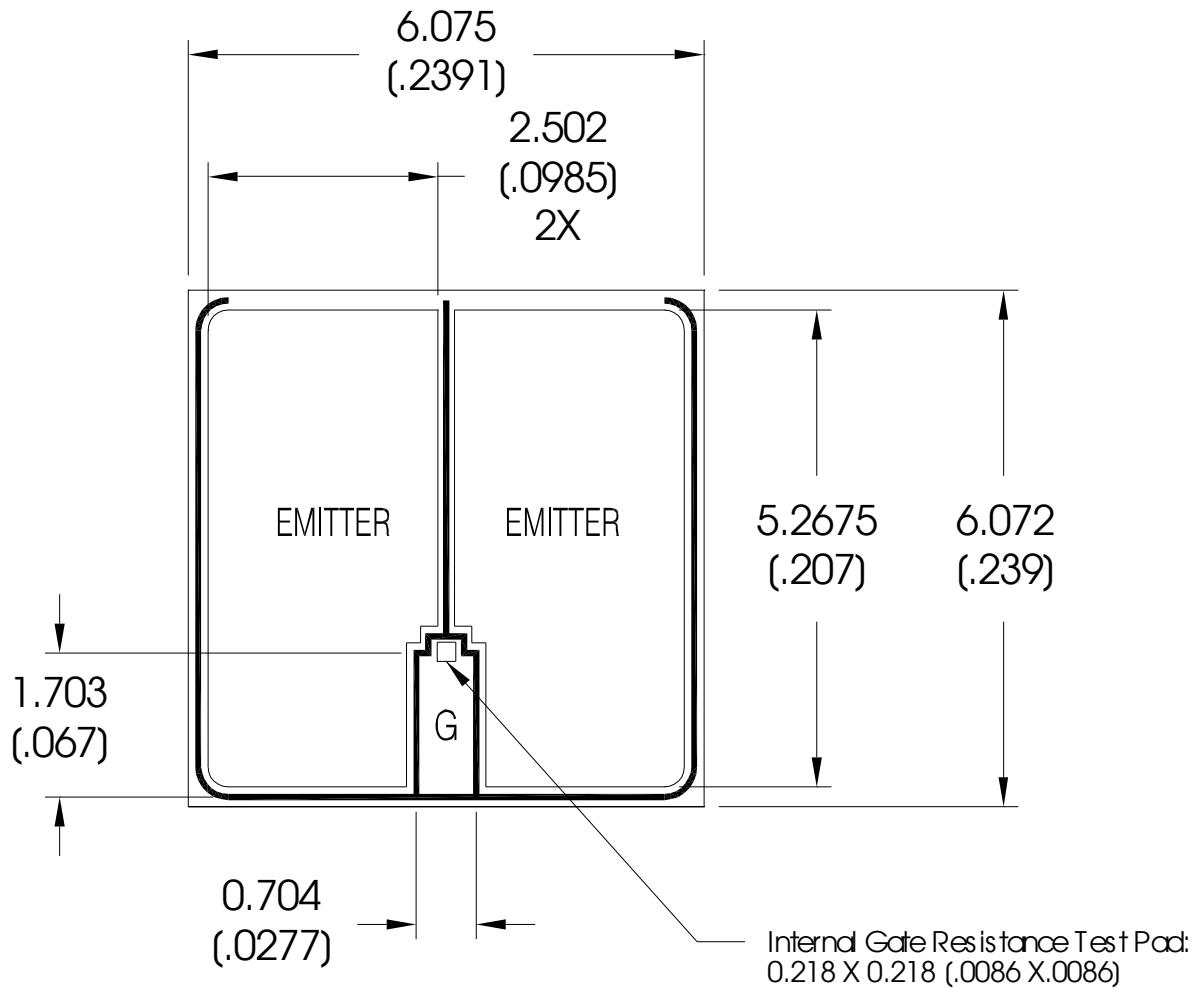
Switching Characteristics (Inductive Load-Not subject to production test-Verified by design/ characterization)

	Parameter	Min.	Typ.	Max.	Units	Conditions ②
$t_{d(on)}$	Turn-On delay time	---	70	---	ns	$I_C = 75\text{A}, V_{CC} = 240\text{V}$ $R_G = 5\Omega, V_{GE} = 15\text{V}, L = 87\mu\text{H}$ $T_J = 25^\circ\text{C}$
t_r	Rise time	---	60	---		
$t_{d(off)}$	Turn-Off delay time	---	395	---		
t_f	Fall time	---	110	---		
$t_{d(on)}$	Turn-On delay time	---	70	---		$I_C = 75\text{A}, V_{CC} = 240\text{V}$ $R_G = 5\Omega, V_{GE} = 15\text{V}, L = 87\mu\text{H}$ $T_J = 150^\circ\text{C}$
t_r	Rise time	---	60	---		
$t_{d(off)}$	Turn-Off delay time	---	465	---		
t_f	Fall time	---	165	---		

Notes:

- ① The current in the application is limited by $T_{J\text{Max}}$ and the thermal properties of the assembly.
- ② Values influenced by parasitic L and C in measurement
- ③ $V_{CC} = 80\% (V_{CES}), V_{GE} = 20\text{V}, L = 85\mu\text{H}, R_G = 5\Omega.$
- ④ Pulse width $\leq 400\mu\text{s};$ duty cycle $\leq 2\%.$
- ⑤ Die Level Characterization

Chip drawing



NOTES:

1. ALL DIMENSIONS ARE SHOWN IN MILLIMETERS (INCHES).
2. CONTROLLING DIMENSION: INCHES
3. DIE WIDTH AND LENGTH TOLERANCE: -0.0508 (.002)
4. DIE THICKNESS = 0.203 (.008)

REFERENCE: IRG7C350UB-R

Additional Testing and Screening

For Customers requiring product supplied as Known Good Die (KGD) or requiring specific die level testing, please contact your local IR Sales.

Shipping

Three shipping options are offered.

- Un-sawn wafer
- Die in waffle pack (consult the IR Die Sales team for availability)
- Die on film (consult the IR Die Sales team for availability)

Tape and Reel is also available for some products. Please consult your local IR sales office or email <http://die.irf.com> for additional information.

Please specify your required shipping option when requesting prices and ordering Die product. If not specified, Un-sawn wafer will be assumed.

Handling

- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Product must be handled only in a class 10,000 or better-designated clean room environment.
- Singulated die are not to be handled with tweezers. A vacuum wand with a non-metallic ESD protected tip should be used.

Wafer/Die Storage

- Proper storage conditions are necessary to prevent product contamination and/or degradation after shipment.
- Un-sawn wafers and singulated die can be stored for up to 12 months when in the original sealed packaging at room temperature (45% +/- 15% RH controlled environment).
- Un-sawn wafers and singulated die that have been opened can be stored when returned to their containers and placed in a Nitrogen purged cabinet, at room temperature (45% +/- 15% RH controlled environment).
- Note: To reduce the risk of contamination or degradation, it is recommended that product not being used in the assembly process be returned to their original containers and resealed with a vacuum seal process.
- Sawn wafers on a film frame are intended for immediate use and have a limited shelf life.
- Die in Surf Tape type carrier tape are intended for immediate use and have a limited shelf life. This is primarily due to the nature of the adhesive tape used to hold the product in the carrier tape cavity. This product can be stored for up to 30 days. This applies whether or not the material has remained in its original sealed container.

Further Information

For further information please contact your local IR Sales office or email your enquiry to <http://die.irf.com>

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial market.
Qualification Standards can be found on IR's Web site.

International
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