International
IOR Rectifier

AUTOMOTIVE GRADE

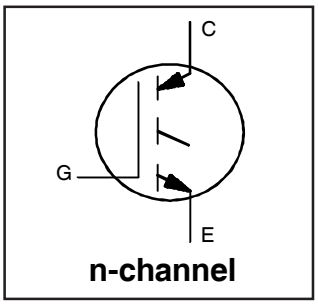
PD - 96279

AUIRG7CH80K6B-M

- 100% Tested at Probe *

Features

- Designed for Automotive Application**
- Solderable Front Metal
- Low $V_{CE\ (on)}$ Trench IGBT Technology
- Low Switching Losses
- Maximum Junction Temperature 175 °C
- Short Circuit Rated
- Square RBSOA
- Positive $V_{CE\ (on)}$ Temperature Coefficient
- Tight Parameter Distribution



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Benefits

- High Efficiency in a Wide Range of Applications
- Suitable for a Wide Range of Switching Frequencies due to Low $V_{CE\ (on)}$ and Low Switching Losses
- Rugged Transient Performance for Increased Reliability
- Excellent Current Sharing in Parallel Operation
- Enables Double side cooling and higher current density
- Eliminates wire bonds and Improves Reliability

Applications

- Medium/High Power Inverters
- HEV/EV Inverter

Chip Type	VCE	ICn	Die Size	Package
AUIRG7CH80K6B	1200V	200A	12 X 12 mm2	Wafer

Mechanical Parameter

Die Size	12.075x12.075	mm2
Emiter Pad Size (Included Gate Pad)	See Die Drawing	
Gate Pad Size	Round, 1mm diameter	
Area Total / Active	144/114	
Thickness	140	µm
Wafer Size	150	mm
Flat Position	0	Degrees
Maximum-Possible Chips per Wafer	89 pcs	
Passivation Frontside	Silicon Nitride	
Front Metal	Al (4µm), Ti (0.1µm), Ni (0.2µm), Ag (0.6µm)	
Backside Metal	Al (0.1µm), Ti (0.1µm), Ni (0.4µm), Ag (0.6µm)	
Die Bond	Electrically conductive epoxy or solder	
Reject Ink Dot Size	0.51mm min (black, center)	
Recommended Storage Environment	Store in original container, in dry Nitrogen, <6 months at an ambient temperature of 23°C	

Note:

* This IR product is 100% tested at wafer level and is manufactured using established, mature and well characterized processes. Due to restrictions in die level processing, die may not be equivalent to standard package products and are therefore offered with a conditional performance guarantee. The above data sheet is based on IR sample testing under certain predetermined and assumed conditions, and are provided for illustration purposes only. Customers are encouraged to perform testing in actual proposed package and use conditions. IR die products are tested using IR-based quality assurance procedures and are manufactured using IR's established processes. Programs for customer-specified testing are available upon request. IR has experienced assembly yields of generally 95% or greater for individual die; however, customer's results will vary. Estimates such as those described and set forth in this data sheet for semiconductor die will vary depending on a number of packaging, handling, use and other factors. Sold die may not perform on an equivalent basis to standard package products and are therefore offered with a limited warranty as described in IR's applicable standard terms and conditions of sale. All IR die sales are subject to IR's applicable standard terms and conditions of sale, which are available upon request. For customers requiring a particular parameter to be guaranteed, special testing can be carried out or product can bepurchased as known good die.

** Technology qualified in sup-TO247 package according to AEC-Q101.

Maximum Ratings

	Parameter	Max.	Units
V_{CE}	Collector-Emitter Voltage, T_J=25°C	1200	V
$I_{C(Nominal)}$	DC Collector Current, Limited by T_{JMAX}	200 ①	A
I_{LM}	Clamped Inductive Load Current ③	800	A
V_{GE}	Gate Emitter Voltage	± 30	V
T_J, T_{STG}	Operating Junction and Storage Temperature	-40 to +175	°C

Static Characteristics (Tested on wafers) . T_J=25°C

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{(BR)CES}$	Collector-to-Emitter Breakdown Voltage	1200	—	—	V	V_{GE} = 0V, I_C = 250µA ④
$V_{CE(on)}$	Collector-to-Emitter Saturation Voltage	—	1.16	1.35		V_{GE} = 15V, I_C = 20A , T_J=25°C
$V_{GE(th)}$	Gate-Emitter Threshold Voltage	5.0	—	7.5		I_C = 7.0mA , V_{GE} = V_{CE}
I_{CES}	Zero Gate Voltage Collector Current	—	3.0	25	µA	V_{CE} = 1200V, V_{GE} = 0V
I_{GES}	Gate Emitter Leakage Current	—	—	± 400	nA	V_{CE} = 0V, V_{GE} = 30V

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

	Parameter	Min.	Typ.	Max.	Units	Conditions
$V_{CE(on)}$	Collector-to-Emitter Saturation Voltage	—	2.15	2.45	V	V_{GE} = 15V, I_C = 200A , T_J = 25°C
		—	2.85	3.15		V_{GE} = 15V, I_C = 200A , T_J = 175°C
SCSOA	Short Circuit Safe Operating Area	6	—	—	µs	V_{GE}=15V, V_{CC}=800V, R_G= 5Ω, V_P=1200V,T_J = 150°C
RBSOA	Reverse Bias Safe Operating Area	FULL SQUARE				T_J = 150°C, I_C = 800A V_{CC} = 960V, Vp =1200V Rg = 5Ω, V_{GE} = +20V to 0V
C_{iss}	Input Capacitance	—	24120	—	pF	V_{GE} = 0V
C_{oss}	Output Capacitance	—	890	—		V_{CE} = 25V
C_{rss}	Reverse Transfer Capacitance	—	510	—		f = 1.0MHz,
Q_g	Total Gate Charge (turn-on)	—	920	—	nC	I_C = 200A
Q_{ge}	Gate-to-Emitter Charge (turn-on)	—	250	—		V_{GE} = 15V
Q_{gc}	Gate-to-Collector Charge (turn-on)	—	430	—		V_{CC} = 600V

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	—	190	—	ns	I_C = 200A, V_{CC} = 600V
t_r	Rise time	—	140	—		R_G = 5Ω, V_{GE}=15V
$t_{d(off)}$	Turn-Off delay time	—	1010	—		T_J = 25°C
t_f	Fall time	—	60	—		
$t_{d(on)}$	Turn-On delay time	—	180	—		I_C = 200A, V_{CC} = 600V
t_r	Rise time	—	150	—		R_G = 5Ω, V_{GE}=15V
$t_{d(off)}$	Turn-Off delay time	—	1140	—		T_J = 150°C
t_f	Fall time	—	80	—		

Notes:

① Depending on thermal properties of assembly

② Values influenced by parasitic L and C in measurement

③ V_{CC} = 80% (V_{CES}), V_{GE} = 20V, L = 28 µH, R_G = 5 Ω.

④ Refer to AN-1086 for guidelines for measuring $V_{(BR)CES}$ safely

Chip drawings available upon request

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.
Qualification Standards can be found on IR's Web site.

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