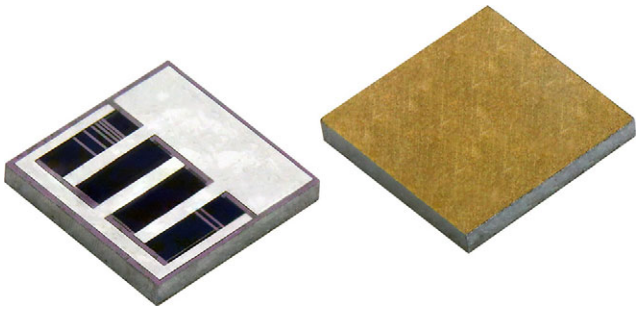
Thin Film, High Power Back-Contact Resistor



LINKS TO ADDITIONAL RESOURCES

3D Models | Videos | Infographics | Did You Know? | Capabilities and Custom Options

The IGBR series is an AEC-Q200 qualified thin film resistor that utilizes the excellent thermal properties of silicon to allow ultra high power rating in a miniature case size for sinterable and hybrid assemblies.

The IGBR's back contact design requires only one wire bond thus saving hybrid space.

The IGBR's are manufactured using Vishay Electro-Films (EFI) sophisticated thin film equipment and manufacturing technology.

The IGBR's are 100 % electrically tested and visually inspected to automotive, military, or commercial inspection per internal standards.

FEATURES

- AEC-Q200 qualified available, produced in ITAF 16949 certified facility
- Designed to operate at elevated temperatures up to 200 °C
- Noise reduction or elimination when used in SiC power modules
- Sintering, soldering, and epoxy attachment options
- Single wire bond assembly
- Moisture resistant
- Case size: 0202 to 0808
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

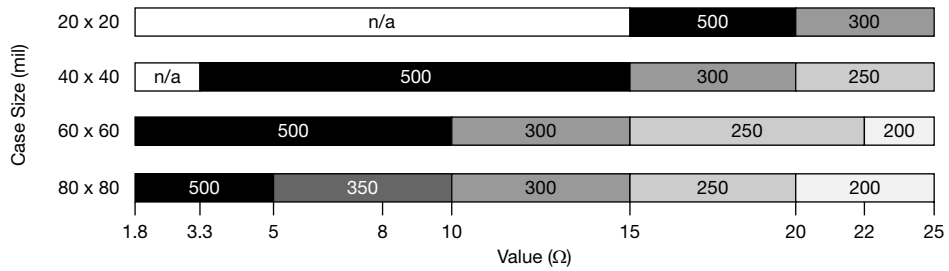
Pb-free RoHS COMPLIANT HALOGEN FREE GREEN (5-2008)

APPLICATIONS

- Current balancing resistor for SiC, GaN, and IGBT power modules
  - Automotive electrification
  - High power MRI
  - Industrial HVAC
  - Alternative energy
- LED lighting
- Hybrid assemblies
- Data management servers

TEMPERATURE COEFFICIENT OF RESISTANCE, VALUES, AND TOLERANCES		
PARAMETER	**VALUE**	**UNIT**
Total Resistance Range	1.8 to 25	Ω
Standard Tolerances	5, 10, 25	%
TCR	± 500	ppm/°C

TCR (ppm/°C) BY CASE SIZE AND VALUE



STANDARD ELECTRICAL SPECIFICATIONS		
PARAMETER	**VALUE**	**UNIT**
Operating Film Temperature Range	250 max.	°C
Operating Temperature Range	IGBRA: -55 to +125 IGBRB: -55 to +150 IGBRC / IGBRD: -55 to +200	°C
Working Voltage	75 max.	V
Breakdown Voltage	400 max.	V
DC Power Rating (1)	Up to 4	W
Load Life Stability, 1000 h (2)	± 1 $\Delta R/R$	%
Short Time Overload, 2.5 x Rated Power, 25 °C, 5 s	± 0.25 $\Delta R/R$	%
Thermal Shock, MIL-STD-202, Method 107 F	± 1 $\Delta R/R$	%
Moisture Resistance, MIL-STD-202, Method 106	± 0.25 $\Delta R/R$	%
High Temperature Exposure, 100 h (2)	± 0.5 $\Delta R/R$	%
Low Temperature Operation, 45 min, -65 °C	± 0.5 $\Delta R/R$	%

Notes

(1) Power rating determined by application specific heat sink properties. See table “Power Rating by Case Size” for more details

(2) Test temperature in reference to maximum operating temperature

- AEC-Q200 testing specifications available upon request

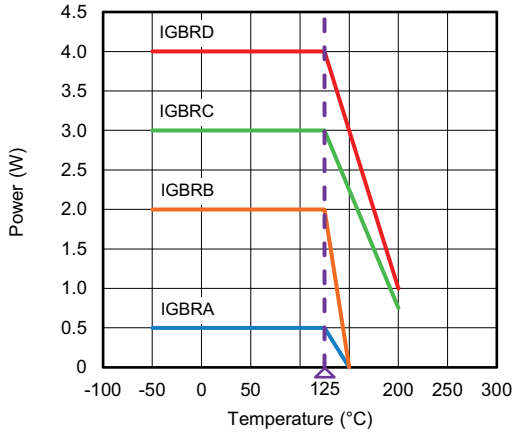
POWER RATING BY CASE SIZE						
CASE SIZE	**CHIP SIZE mil (mm) (1)**	**BOND PAD SIZE mil (mm)**	**DIE THICKNESS mil (mm) (2)**	**MAX. POWER (W) (1)**	***R* MIN. Ω**	***R* MAX. Ω**
0202	20 x 20 (0.51 x 0.51)	10 x 16 (0.25 x 0.41)	10 (0.25)	0.5	15	25
0404	40 x 40 (1.02 x 1.02)	15 x 36 (0.38 x 0.91)	10 (0.25)	2	3.3	25
0606	60 x 60 (1.52 x 1.52)	20 x 56 (0.51 x 1.42)	10 (0.25)	3	1.8	25
0808	80 x 80 (2.03 x 2.03)	27 x 76 (0.69 x 1.93)	10 (0.25)	4	1.8	25

Notes

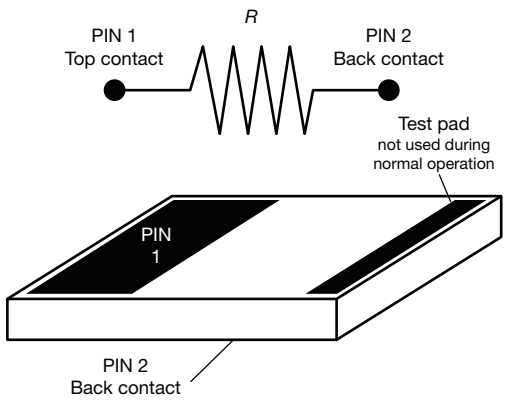
(1) Dimension tolerances are ± 0.051 mm (± 2 mil)

(2) Typical maximum power between film and back contact. Does not include die attach joint (epoxy or solder)

POWER DERATING CURVES



SCHEMATIC



MATERIAL SPECIFICATIONS	
PARAMETER	
MSL Designation	MSL1 (floor life unlimited)
Chip Substrate Material	Oxidized silicon, 10 kÅ minimum SiO_2
Film Material	Tantalum Nitride
Case Size	See table “Power Rating by Case Size”
Passivation	None
Number of Pads	1
Top Terminations Suitable for Aluminum Wire-Bonding	Al (2.5 µm min.)
Back Termination (for epoxy, lead (Pb)-free solder, or sintering assembly)	S = Ti (800 Å to 1200 Å) NiV (1600 Å to 2400 Å) Ag (5000 Å to 7000 Å)
	P = TiW (500 Å to 1000 Å) Pd (4000 Å to 6000 Å) Au (3000 Å to 5000 Å)
	N = TiW (500 Å to 1000 Å) Ni (6000 Å to 7000 Å) Au (3000 Å to 5000 Å)
	T = TiW (500 Å to 1000 Å) Au (1000 Å to 3000 Å) Ni (40 µ" minimum) Au (40 µ" minimum)

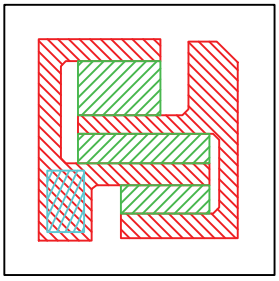
Note

- This product was qualified using 1 mil Al wire at 3 g min pull force

MATERIAL SPECIFICATIONS

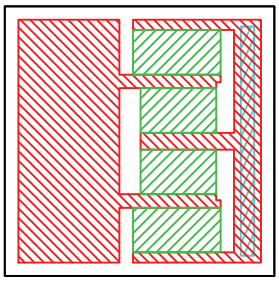
Conductor material Resistor material Backside connection

VERSION A (0202)

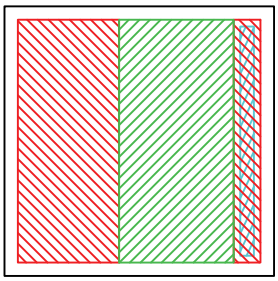


IGBRA - 15 Ω to 25 Ω

VERSION B (0404)



IGBRB - 3.3 Ω to 12.9 Ω (1)

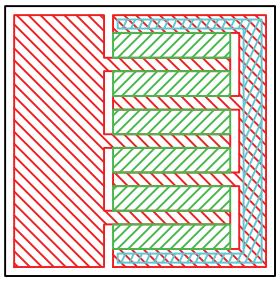


IGBRB - 13 Ω to 25 Ω

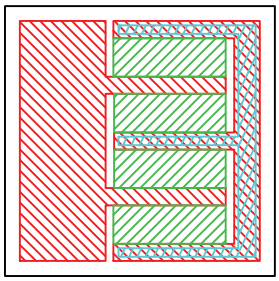
MATERIAL SPECIFICATIONS

Conductor material | Resistor material | Backside connection

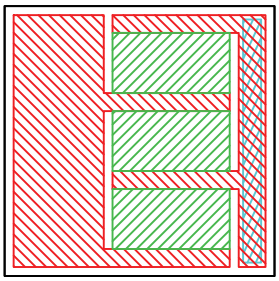
VERSION C (0606)



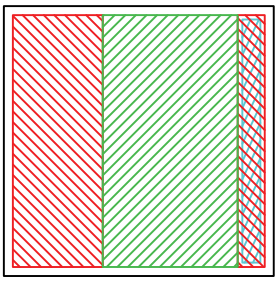
IGBRC - 1.8 Ω to 2.9 Ω



IGBRC - 3 Ω to 5.5 Ω [1]

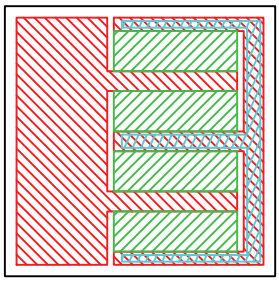


IGBRC - 5.6 Ω to 15.90 Ω [1]

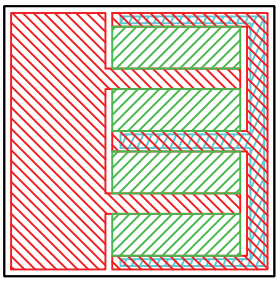


IGBRC - 16 Ω to 25 Ω

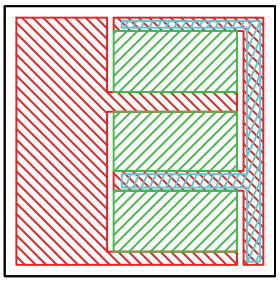
VERSION D (0808)



IGBRD - 1.8 Ω to 5.5 Ω



IGBRD - 5.6 Ω to 14.9 Ω



IGBRD - 15 Ω to 24.9 Ω

Note

[1] AEC-Q200 qualified available

GLOBAL PART NUMBER INFORMATION

Global Part Number: IGBRB3000CJOPCST

Global Part Number Description: IGBR 1 mm 3 Ω 5 % 300 ppm/°C PD Commercial Tape

I	G	B	R	B	3	0	0	0	C	J	O	P	C	S	T

MODEL	SIZE	RESISTANCE (Ω)	RESISTANCE MULTIPLIER CODE	TOL. CODE (%)	TCR (ppm/°C)	BACKSIDE TERMINATION	QUALIFICATION LEVEL	PACKAGING CODE
IGBR High power back-contact resistor	**A** = 20 x 20 **B** = 40 x 40 **C** = 60 x 60 **D** = 80 x 80	First 4 digits are significant figures of resistance	C = 0.001 B = 0.01 A = 0.1	**J** = 5 **K** = 10 **M** = 20 **L** = 25	**J** = ± 500 **W** = ± 350 **O** = ± 300 **M** = ± 250	**S** = Ti / NiV / Ag **P** = TiW / Pd / Au **N** = TiW / Ni / Au **T** = TiW / Au/ Ni/Au [1]	**A** = automotive [2] **M** = military [3] **C** = commercial version 1 [4] **C2** = commercial version 2 [4]	**WS** = waffle pack 100 min., 1 mult. **ST** = diced on tape **TF** = tape and reel 5000 min., 1 mult.

Notes

[1] See “Material Specifications” table for metal thickness
[2] AEC-Q200 qualified, IATF 16949 certified
[3] Visually inspected to MIL-STD-883 M2032 Class H
[4] Vishay internal control standards

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