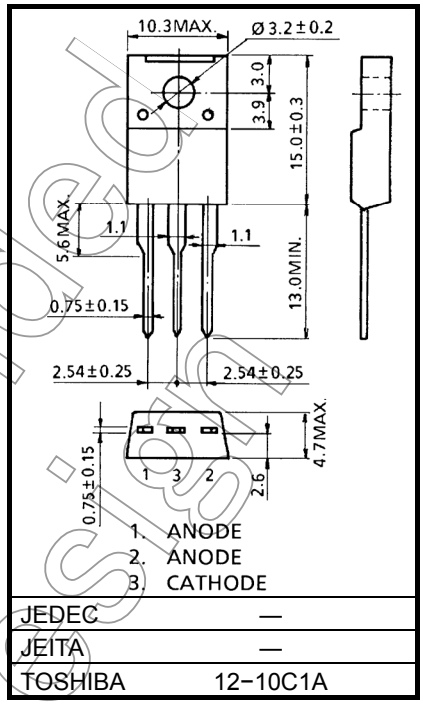
TOSHIBA HIGH EFFICIENCY DIODE STACK (HED) SILICON EPITAXIAL TYPE

5DL2CZ47A, 5FL2CZ47A, 5GL2CZ47A

SWITCHING MODE POWER SUPPLY APPLICATION
CONVERTER & CHOPPER APPLICATION

- Repetitive Peak Reverse Voltage : V_{RRM} = 200 V, 300 V, 400V
- Average Output Rectified Current : I_O = 5 A
- Ultra Fast Reverse-Recovery Time : t_{rr} = 35 ns (Max)
- Low Switching Losses and Output Noise.

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	12−10C1A

Weight: 2.0 g

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Repetitive Peak Reverse Voltage	5DL2CZ47A	V_{RRM}	200	V
	5FL2CZ47A		300	
	5GL2CZ47A		400	
Average Output Rectified Current		I_O	5	A
Peak One Cycle Surge Forward Current (Sin Wave)		I_{FSM}	25 (50Hz)	A
			27.5 (60Hz)	
Junction Temperature		T_j	−40~150	°C
Storage Temperature Range		T_{stg}	−40~150	°C
Screw Torque		—	0.6	N·m

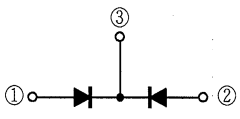
Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/Derating Concept and Methods) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

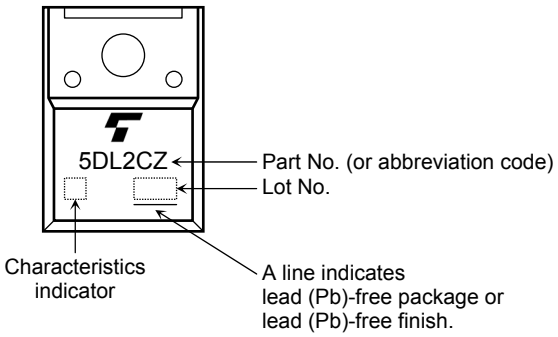
CHARACTERISTIC		SYMBOL	TEST CONDITION	TYP.	MAX	UNIT
Peak Forward Voltage (Note 1)	5DL2CZ47A	V_{FM}	I_{FM} = 2.5A	—	0.98	V
	5FL2CZ47A			—	1.3	
	5GL2CZ47A			—	1.8	
Repetitive Peak Reverse Current (Note 1)	5DL2CZ47A	I_{RRM}	V_{RRM} = Rated	—	10	μA
	5FL2CZ47A			—	10	
	5GL2CZ47A			—	50	
Reverse Recovery Time (Note 1)		t_{rr}	I_F = 2A, di / dt = −20A / μs	—	35	ns
Forward Recovery Time (Note 1)		t_{fr}	I_F = 1A	—	100	ns
Thermal Resistance		$R_{th\ (j-c)}$	Total DC, Junction to Case	—	3.8	°C / W

Note 1: A value applied to one cell.

POLARITY



MARKING



Abbreviation Code	Part No.
5DL2CZ	5DL2CZ47A
5FL2CZ	5FL2CZ47A
5GL2CZ	5GL2CZ47A

Handling Precaution

The absolute maximum ratings denote the absolute maximum ratings, which are rated values and must not be exceeded during operation, even for an instant. The following are the general derating methods that we recommend when you design a circuit with a device.

V_{RRM}: We recommend that the worst case voltage, including surge voltage, be no greater than 80% of the absolute maximum rating of V_{RRM} for a DC circuit and be no greater than 50% of that of V_{RRM} for an AC circuit. V_{RRM} has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.

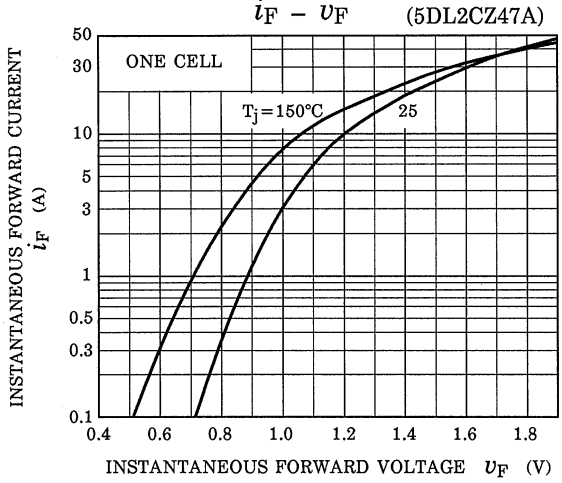
I_O: We recommend that the worst case current be no greater than 80% of the absolute maximum rating of I_O. Carry out adequate heat design. If you can't design a circuit with excellent heat radiation, set the margin by using an allowable Tamax-I_O curve.

This rating specifies the non-repetitive peak current in one cycle of a 50-Hz sine wave, condition angle 180. Therefore, this is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

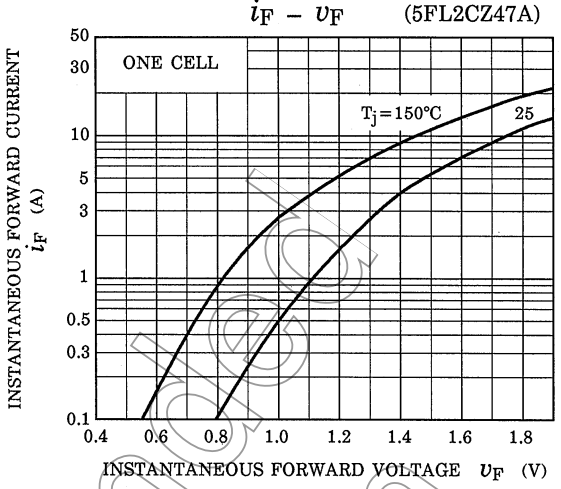
We recommend that a device be used at a Tj of below 120°C under the worst load and heat radiation conditions.

Please refer to the Rectifiers databook for further information.

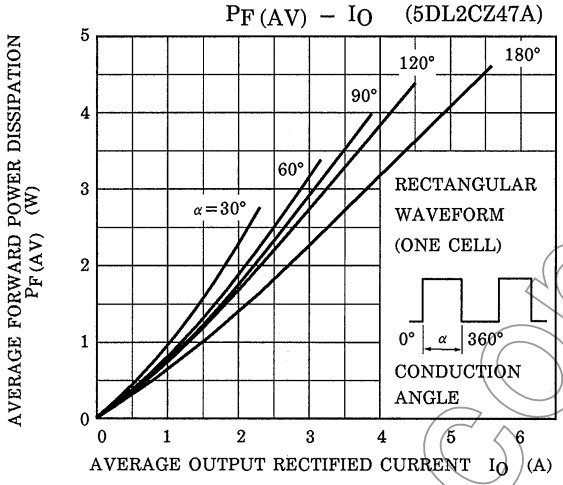
$i_F - v_F$ (5DL2CZ47A)



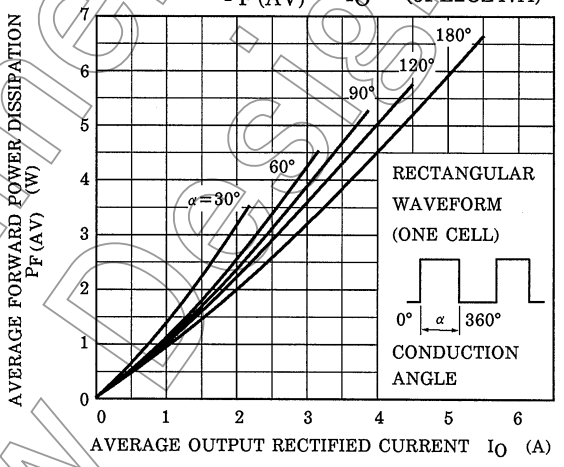
$i_F - v_F$ (5FL2CZ47A)



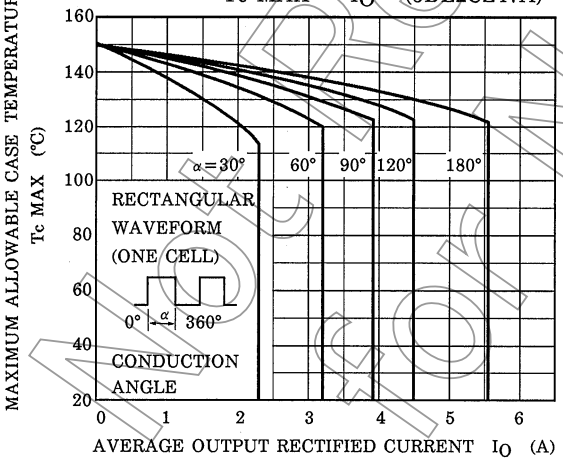
$P_{F(AV)} - I_O$ (5DL2CZ47A)



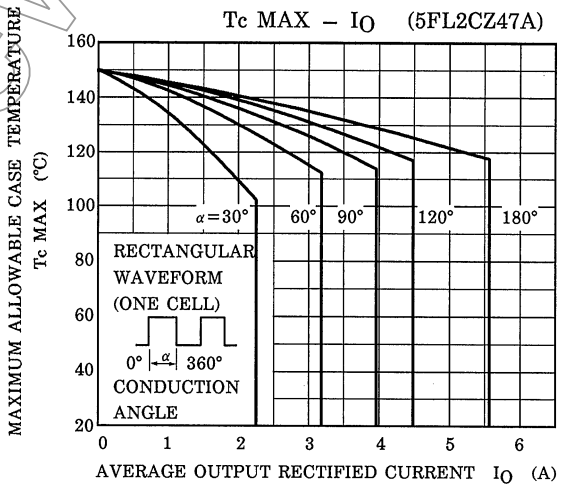
$P_{F(AV)} - I_O$ (5FL2CZ47A)



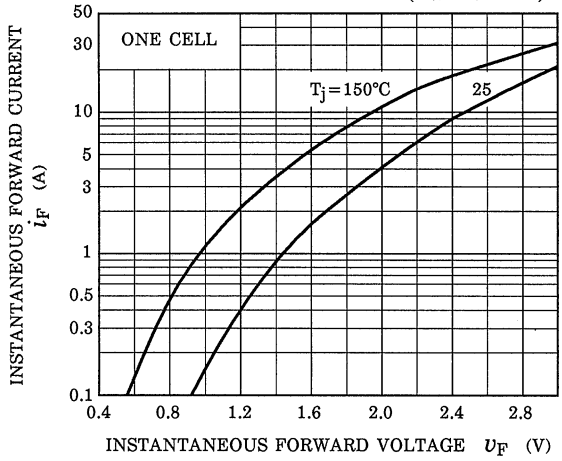
T_C MAX $- I_O$ (5DL2CZ47A)



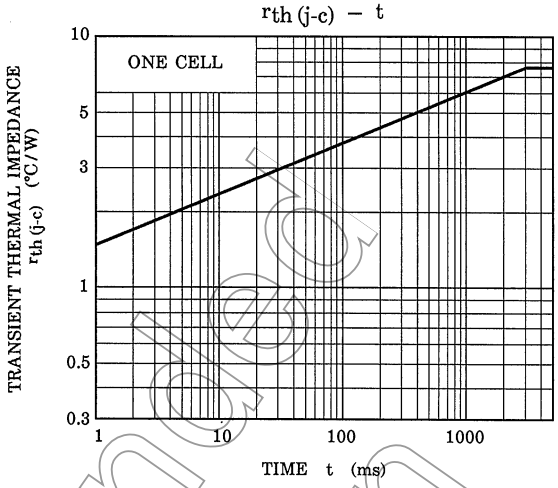
T_C MAX $- I_O$ (5FL2CZ47A)



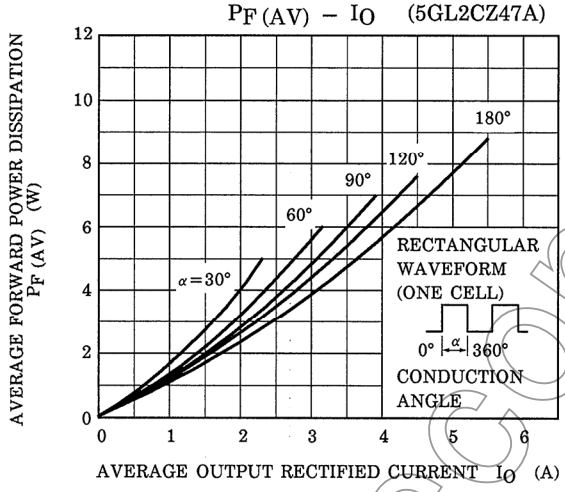
$i_F - v_F$ (5GL2CZ47A)



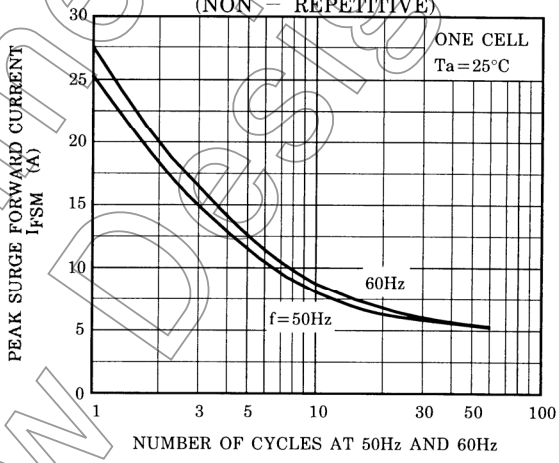
r_{th} (j-c) − t



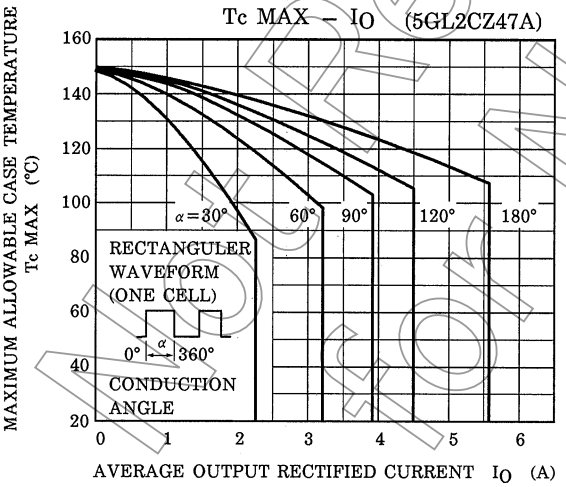
$P_{F(AV)} - I_O$ (5GL2CZ47A)



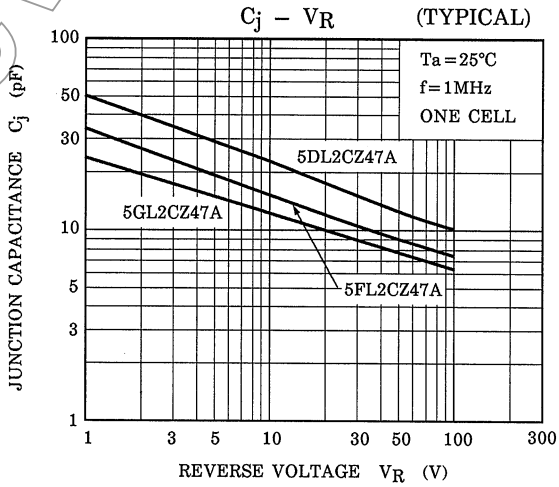
SURGE FORWARD CURRENT (NON − REPETITIVE)



Tc MAX − I_O (5GL2CZ47A)



$C_j - V_R$ (TYPICAL)



RESTRICTIONS ON PRODUCT USE

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- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
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