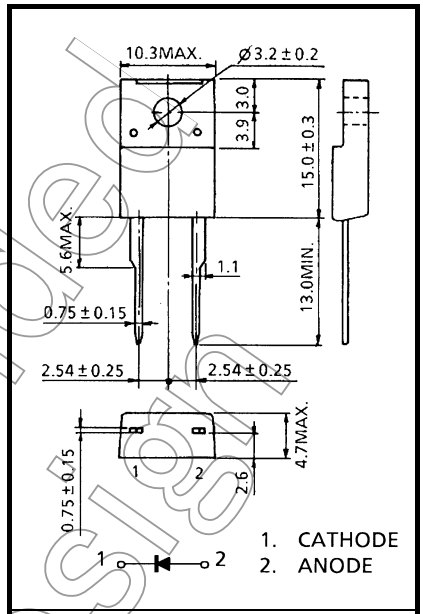
TOSHIBA HIGH EFFICIENCY RECTIFIER SILICON EPITAXIAL TYPE

5DLZ47A

SWITCHING MODE POWER SUPPLY APPLICATION
CONVERTER & CHOPPER APPLICATION

- Repetitive Peak Reverse Voltage : V_{RRM} = 200 V
- Average Forward Current : $I_{F\ (AV)}$ = 5 A
- Ultra Fast Reverse-Recovery Time : t_{rr} = 35 ns (Max)
- Low Forward Voltage : V_{FM} = 0.98 V
- Low Switching Losses and Low Output Noise

Unit: mm



JEDEC	—
JEITA	—
TOSHIBA	3−10C3A

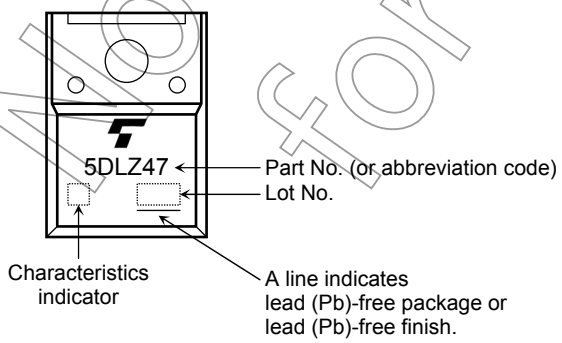
Weight: 2.0g

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Reverse Voltage	V_{RRM}	200	V
Average Forward Current	$I_{F\ (AV)}$	5	A
Peak One Cycle Surge Forward Current (Non−Repetitive)	I_{FSM}	50 (50Hz)	A
		60 (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).

MARKING

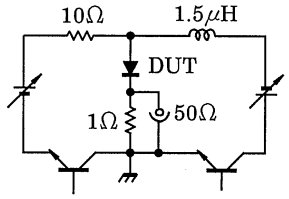


Abbreviation Code	Part No.
5DLZ47	5DLZ47A

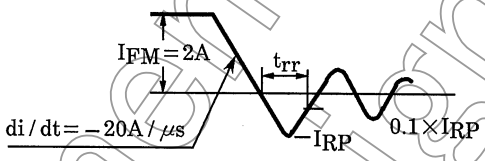
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN	MAX	UNIT
Peak Forward Voltage		V_{FM}	I_{FM} = 5A	—	0.98	V
Repetitive Peak Reverse Current		I_{RRM}	V_{RRM} = 200V	—	10	μA
Reverse Recovery Time	(Note 1)	t_{rr}	I_F = 2A, di / dt = −20A / μs	—	35	ns
Forward Recovery Time	(Note 2)	t_{fr}	I_F = 1A	—	100	ns
Thermal Resistance		$R_{th\ (j-c)}$	DC	—	4.0	°C / W

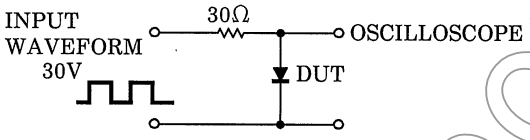
Note 1: t_{rr} TEST CIRCUIT



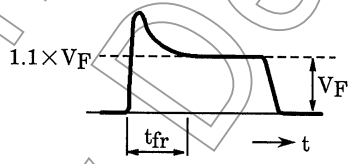
t_{rr} WAVEFORM



Note 2: t_{fr} TEST CIRCUIT



t_{rr} WAVEFORM



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.

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

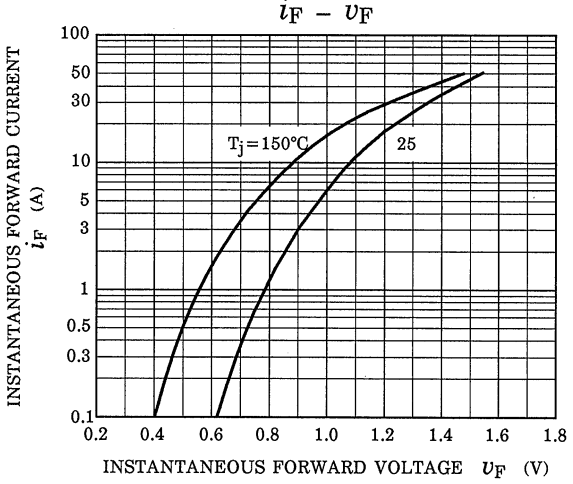
This rating specifies the non-repetitive peak current in one cycle of a 50-Hz sine wave, condition angle 180. Therefore, this is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

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

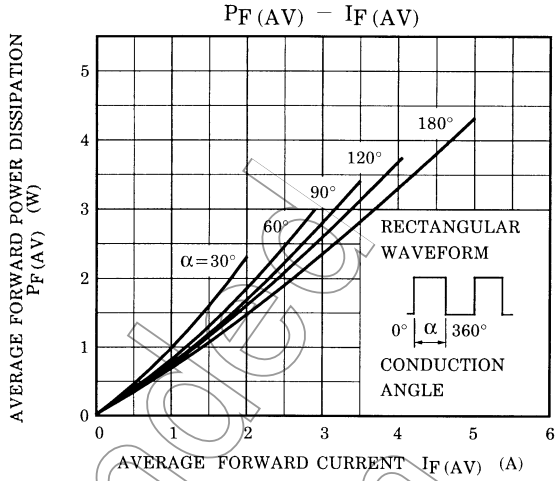
Thermal resistance between junction and ambient fluctuates depending on the device's mounting condition. When using a device, design a circuit board and a soldering land size to match the appropriate thermal resistance value.

Please refer to the Rectifiers databook for further information.

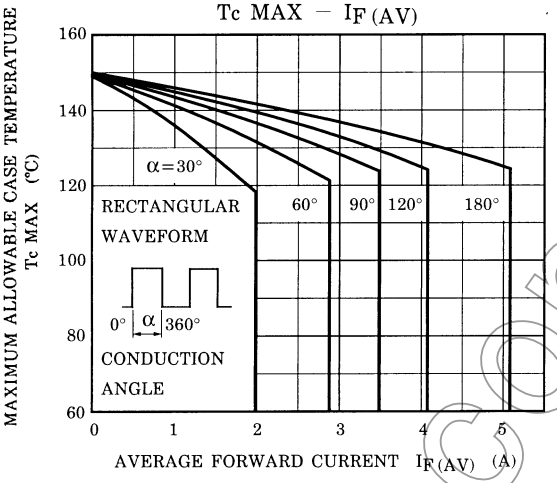
$i_F - v_F$



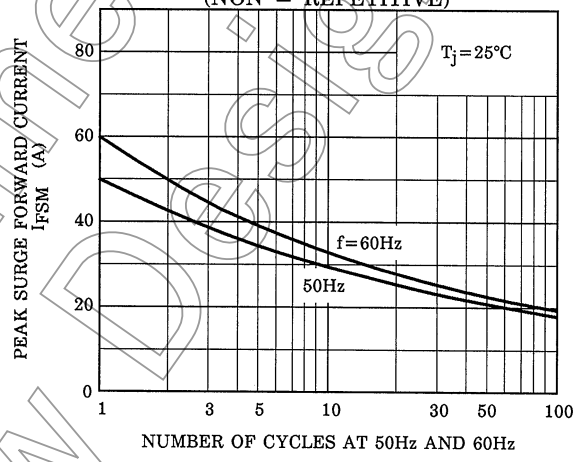
$P_{F(AV)} - I_{F(AV)}$



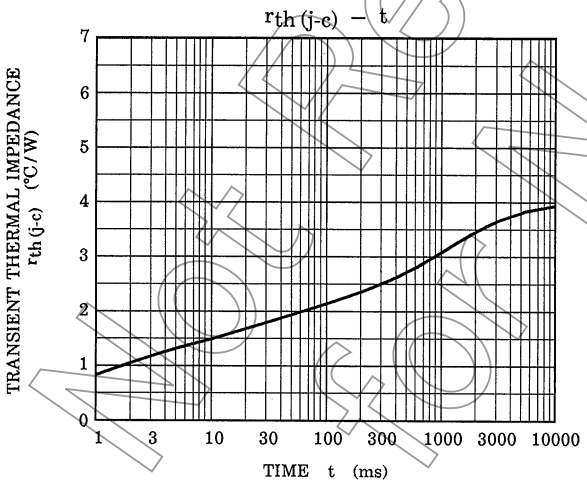
T_c MAX $- I_{F(AV)}$



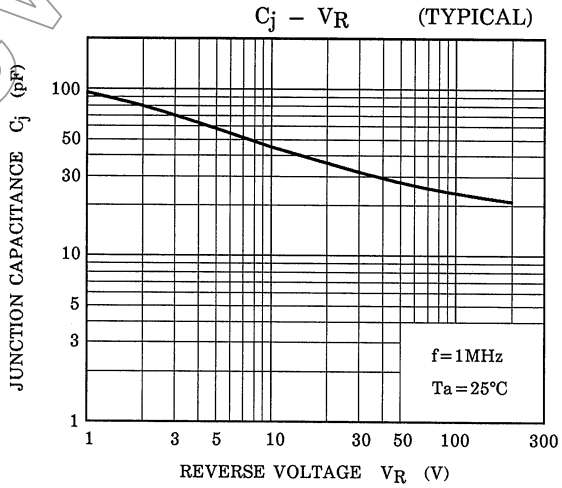
SURGE FORWARD CURRENT (NON – REPETITIVE)



$r_{th(j-c)} - t$



$C_j - V_R$ (TYPICAL)



RESTRICTIONS ON PRODUCT USE

20070701-EN

- The information contained herein is subject to change without notice.
- 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.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc.
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