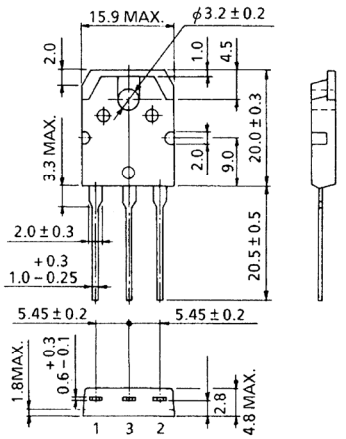
TOSHIBA SCHOTTKY BARRIER RECTIFIER STACK SCHOTTKY BARRIER TYPE

30GWJ2C42C

SWITCHING MODE POWER SUPPLY APPLICATON
CONVERTER & CHOPPER APPLICATION

- Repetitive Peak Reverse Voltage : V_{RRM} = 40 V
- Average Output Rectified Current : I_O = 30 A
- Low Switching Losses and Output Noise

Unit: mm



1. ANODE
2. ANODE
3. CATHODE

JEDEC	—
JEITA	—
TOSHIBA	12-16D1A

Weight: 4.85 g (typ.)

ABSOLUTE MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Repetitive Peak Reverse Voltage	V_{RRM}	40	V
Repetitive Peak Reverse Surge Voltage (Note 1)	V_{RRSM}	48	V
Average Output Rectified Current	I_O	30	A
Peak One Cycle Surge Forward Current (Sine Wave)	I_{FSM}	300 (50Hz)	A
		330 (60Hz)	
Junction Temperature	T_j	−40~125	°C
Storage Temperature Range	T_{stg}	−40~150	°C
Screw Torque	—	0.8	N·m

Note 1: Pulse Width (t_w) ≤500ns, duty (t_w / T) ≤1 / 25

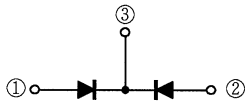
Note 2: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) 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)

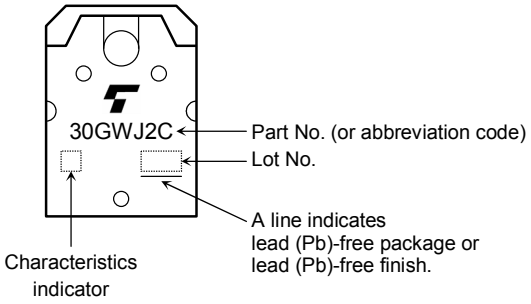
CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN	TYP.	MAX
Peak Forward Voltage (Note 3)	V_{FM}	I_{FM} = 15A	—	0.55	V
Repetitive Peak Reverse Current (Note 3)	I_{RRM}	V_{RRM} = Rated	—	15	mA
Junction Capacitance (Note 3)	C_j	V_R = 10V, f = 1.0MHz	600	—	pF
Thermal Resistance	$R_{th\ (j-c)}$	Total DC, Junction to Case	—	1.0	°C / W

Note 3: A value applied to one cell.

POLARITY



MARKING



Abbreviation Code	Part No.
30GWJ2C	30GWJ2C42C

Handling Precaution

Schottky barrier diodes have reverse current characteristics compared to other diodes.
There is a possibility SBD may cause thermal runaway when it is used under high temperature or high voltage.
Please take forward and reverse loss into consideration during design.

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.

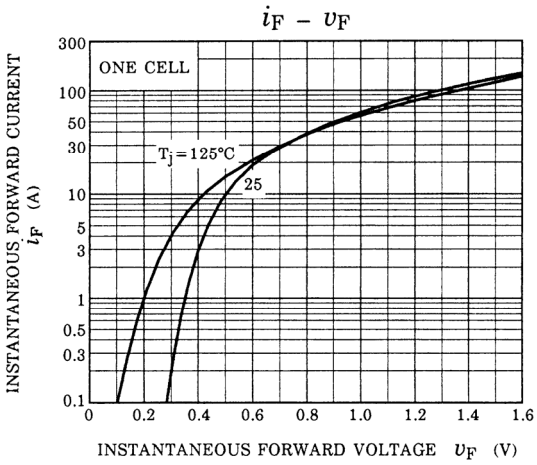
V_{RRM}: Use this rating with reference to the above. V_{RRM} has a temperature coefficient of 0.1%/°C. Take this temperature coefficient into account designing a device at low temperature.

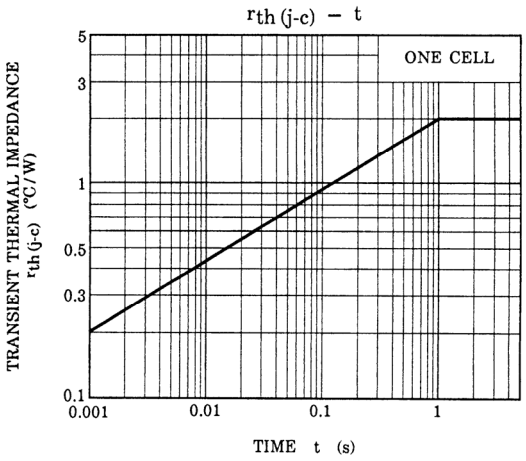
I_O: We recommend that the worst case current be no greater than 80% of the absolute maximum rating of I_O and T_j be below 100°C. When using this device, take the margin into consideration by using an allowable Tamax-I_O curve.

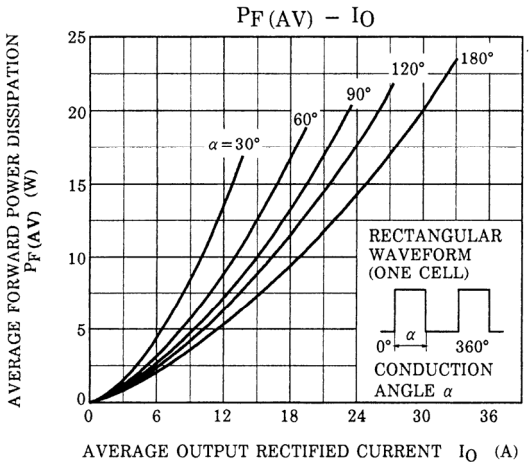
I_{FSM}: This rating specifies the non-repetitive peak current. This is only applied for an abnormal operation, which seldom occurs during the lifespan of the device.

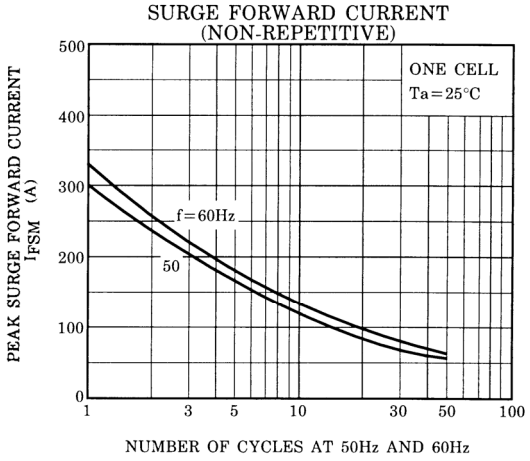
T_j: Derate this rating when using a device in order to ensure high reliability. We recommend that the device be used at a T_j of below 100°C.

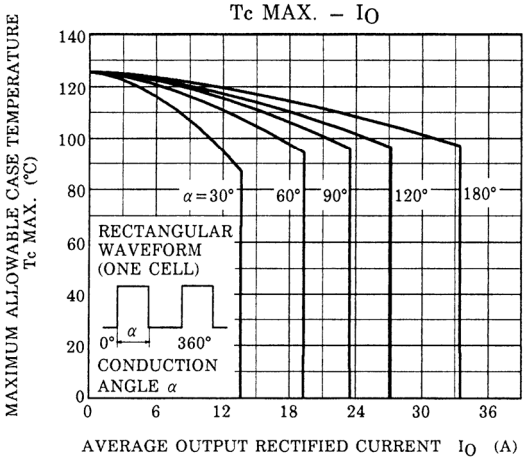
Please refer to the Rectifiers databook for further information.

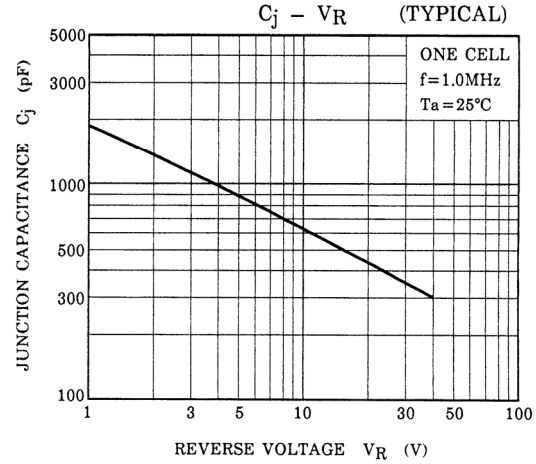

$i_F - v_F$
ONE CELL
T_j = 125°C
25
INSTANTANEOUS FORWARD CURRENT i_F (A)
INSTANTANEOUS FORWARD VOLTAGE v_F (V)


$r_{th\,(j-c)} - t$
ONE CELL
TRANSIENT THERMAL IMPEDANCE $r_{th\,(j-c)}$ (°C/W)
TIME t (s)

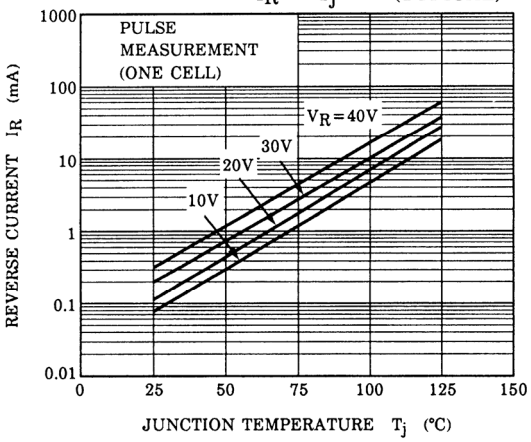

$P_{F\,(AV)} - I_O$
α = 30°
60°
90°
120°
180°
RECTANGULAR WAVEFORM (ONE CELL)
0°
360°
CONDUCTION ANGLE α
AVERAGE FORWARD POWER DISSIPATION $P_{F\,(AV)}$ (W)
AVERAGE OUTPUT RECTIFIED CURRENT I_O (A)


SURGE FORWARD CURRENT (NON-REPETITIVE)
ONE CELL
Ta = 25°C
f = 60Hz
50
PEAK SURGE FORWARD CURRENT I_{FSM} (A)
NUMBER OF CYCLES AT 50Hz AND 60Hz

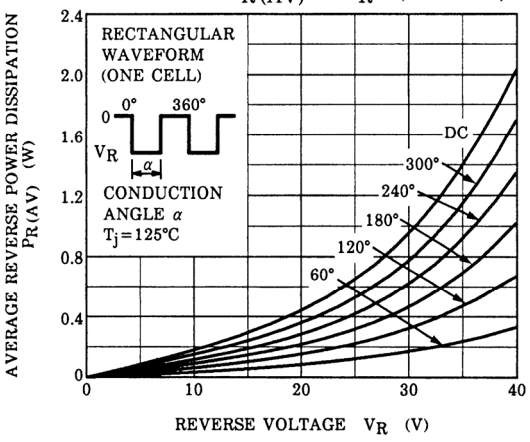

Tc MAX. - I_O
α = 30°
60°
90°
120°
180°
RECTANGULAR WAVEFORM (ONE CELL)
0°
360°
CONDUCTION ANGLE α
MAXIMUM ALLOWABLE CASE TEMPERATURE Tc MAX. (°C)
AVERAGE OUTPUT RECTIFIED CURRENT I_O (A)


$C_j - V_R$ (TYPICAL)
ONE CELL
f = 1.0MHz
Ta = 25°C
JUNCTION CAPACITANCE C_j (pF)
REVERSE VOLTAGE V_R (V)

I_R – T_j (TYPICAL)



$P_{R(AV)}$ – V_R (TYPICAL)



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