

## Features

- Zero reverse recovery current
- Zero forward recovery voltage
- Temperature independent switching behavior
- High temperature operation
- High frequency operation

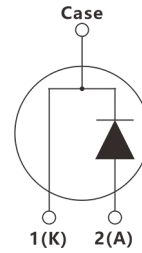
$V_{RRM}$	650V
$I_F (T_C = 146^\circ\text{C})$	20A
$Q_c$	65nC

## Benefits

- Unipolar rectifier
- Substantially reduced switching losses
- No thermal run-away with parallel devices
- Reduced heat sink requirements



TO-220AC



Inner Circuit

## Applications

- SMPS, PFC
- Solar application, UPS, EV/HEV
- Motor drives, Wind turbine, Rail traction





**Maximum Ratings** (at  $T_j = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Value	Unit
Repetitive Peak Reverse Voltage	$V_{RRM}$	650	V
Surge Peak Reverse Voltage	$V_{RSM}$	650	V
Continuous Forward Current $T_c = 25^\circ\text{C}$ $T_c = 135^\circ\text{C}$ $T_c = 146^\circ\text{C}$	$I_F$	54.7 24.8 20	A
Repetitive Peak Forward Surge Current $T_c = 25^\circ\text{C}$ , $t_p = 10\text{ms}$ , Half Sine Pulse, $D=0.3$	$I_{FRM}$	100	A
Non-Repetitive Forward Surge Current $T_c = 25^\circ\text{C}$ , $t_p = 10\text{ms}$ , Half Sine Pulse	$I_{FSM}$	180	A
$i^2t$ Value $T_c = 25^\circ\text{C}$ , $t_p = 10\text{ms}$ , Half Sine Pulse	$\int i^2 dt$	162	$\text{A}^2\text{s}$
Power Dissipation $T_c = 25^\circ\text{C}$ $T_c = 110^\circ\text{C}$	$P_{tot}$	170 74	W
Operating Junction Range	$T_j$	-55 to +175	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-55 to +150	$^\circ\text{C}$
Mounting Torque, M3 Screw	M	1	Nm

**Electrical Characteristics** (at  $T_j = 25^\circ\text{C}$ , unless otherwise specified)

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
DC Blocking Voltage	$V_{DC}$		650	-	-	V
Forward Voltage	$V_F$	$I_F = 20\text{A}$ $T_j = 25^\circ\text{C}$	-	1.39	1.7	V
		$T_j = 175^\circ\text{C}$	-	1.63	2	
Reverse Current	$I_R$	$V_R = 650\text{V}$ $T_j = 25^\circ\text{C}$	-	2.85	50	$\mu\text{A}$
		$T_j = 175^\circ\text{C}$	-	13.7	100	
Total Capacitance	C	$f = 1\text{MHz}$ $V_R = 0\text{V}$	-	1328	-	pF
		$V_R = 200\text{V}$	-	128	-	
		$V_R = 400\text{V}$	-	125	-	
Total Capacitive Charge	$Q_C$	$V_R = 400\text{V}$ $T_j = 25^\circ\text{C}$	-	65	-	nC
Capacitance Stored Energy	$E_C$	$V_R = 400\text{V}$	-	16	-	$\mu\text{J}$

**Thermal Characteristics**

Parameter	Symbol	Test Condition	Value			Unit
			min.	typ.	max.	
Thermal Resistance, junction-case	$R_{th(j-c)}$		-	0.88	-	$^\circ\text{C}/\text{W}$

Typical Characteristics Curves

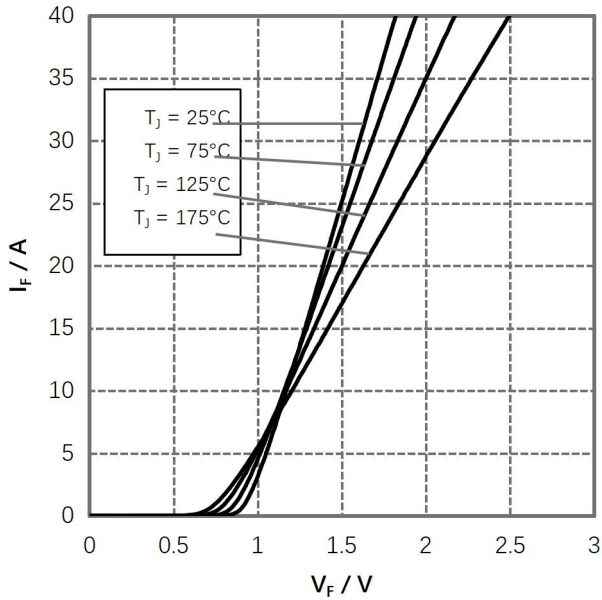


Figure 1. Forward Characteristics

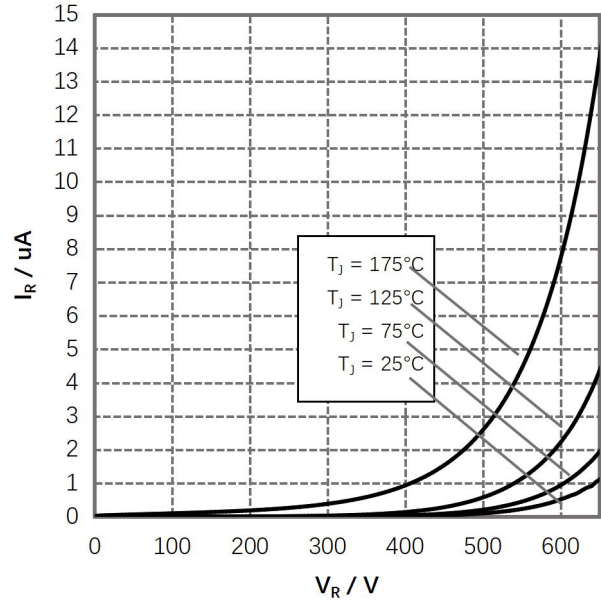


Figure 2. Reverse Characteristics

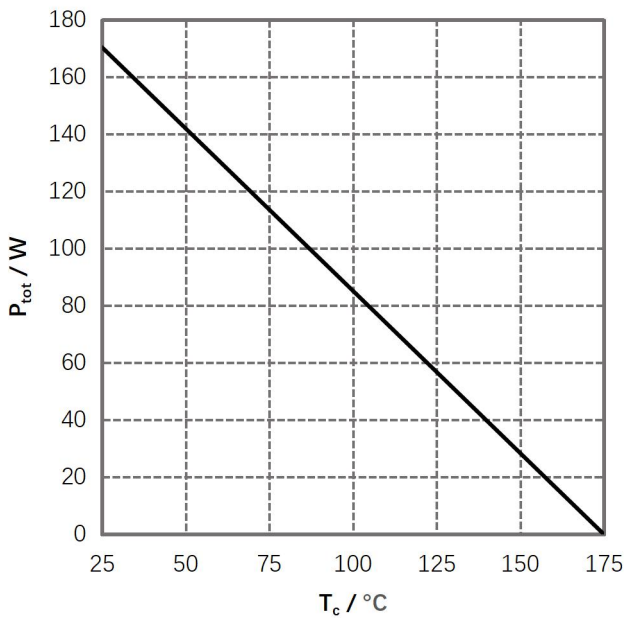


Figure 3. Power Derating

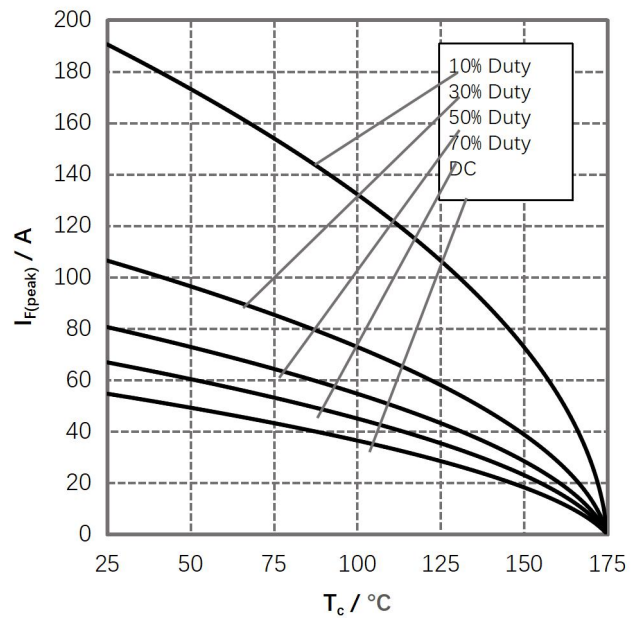


Figure 4. Current Derating

Typical Characteristics Curves

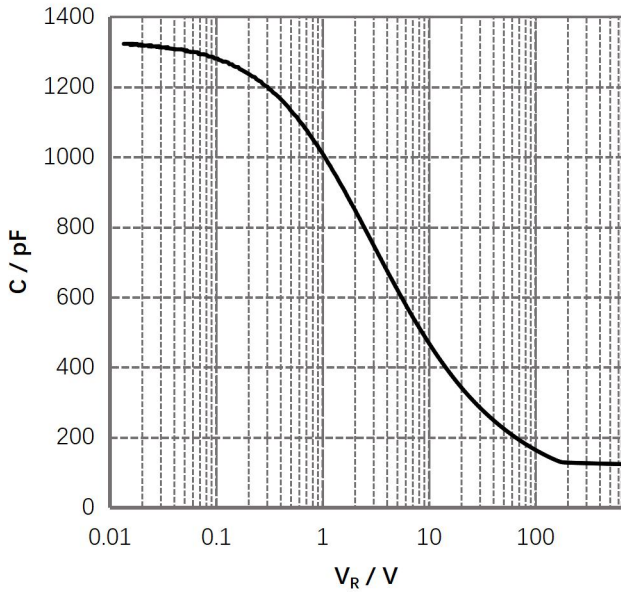


Figure 5. Capacitance vs. Reverse Voltage

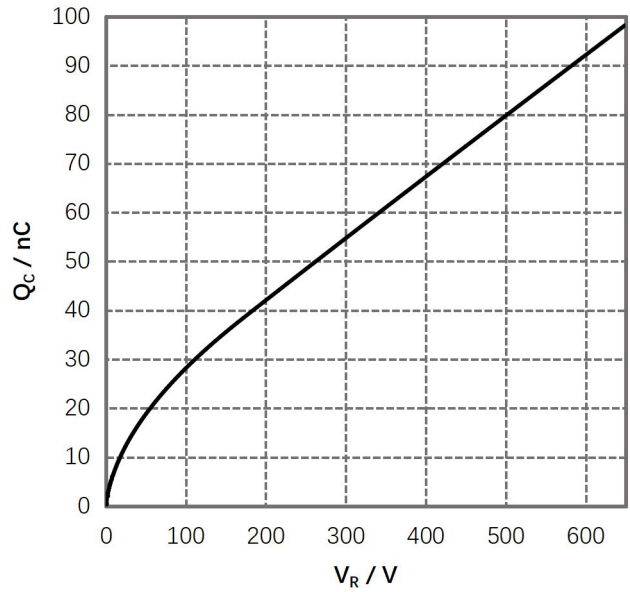


Figure 6. Reverse Charge vs. Reverse Voltage

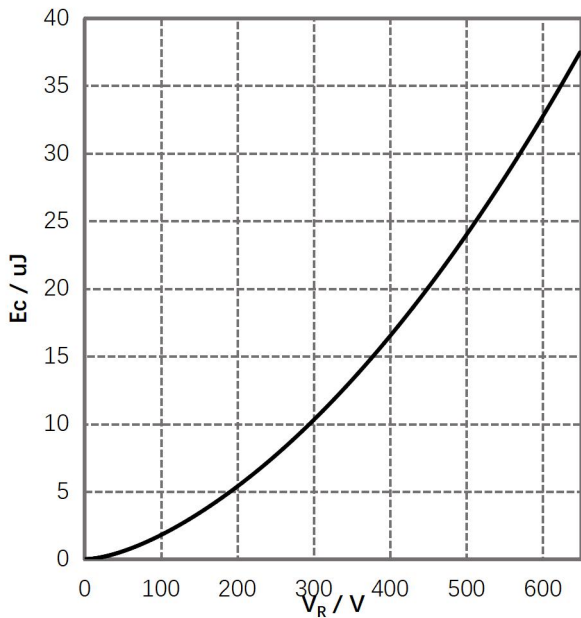


Figure 7. Capacitance Stored Energy

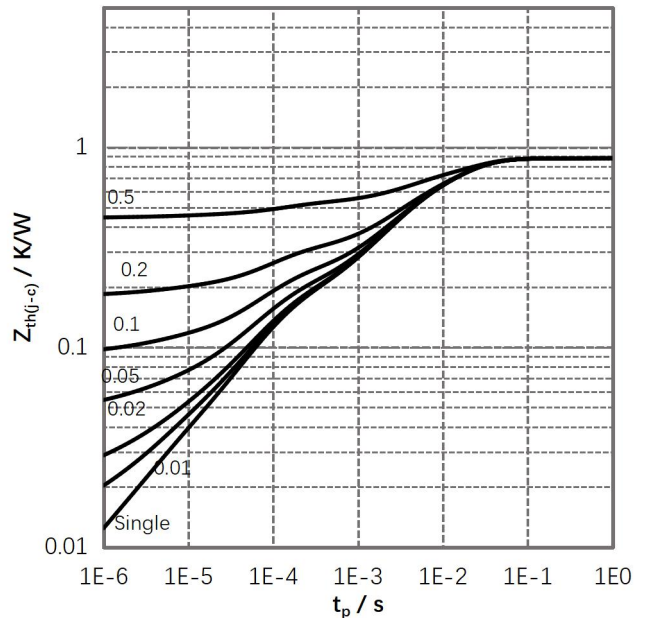
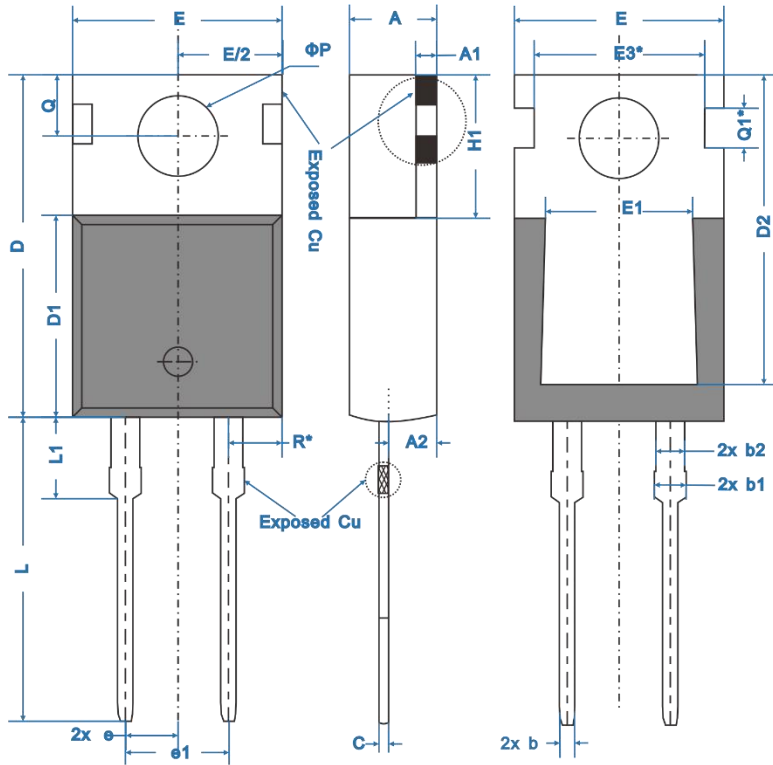


Figure 8. Transient Thermal Impedance



**Package Dimensions**



Unit: mm

Symbol	Dimensions			Notes
	Min.	NOM.	Max.	
A	4.24	4.44	4.64	
A1	1.15	1.27	1.40	
A2	2.30	2.48	2.70	
b	0.70	0.80	0.90	
b1	1.20	1.55	1.75	
b2	1.20	1.45	1.70	
c	0.40	0.50	0.60	
D	14.70	15.37	16.00	4
D1	8.82	8.92	9.02	
D2	12.63	12.73	12.83	5
E	9.96	10.16	10.36	4,5
E1	6.86	7.77	8.89	5
E3*	8.70 Ref.			
e	2.54 BSC			
e1	5.08 BSC			
H1	6.30	6.45	6.60	5,6
L	13.47	13.72	13.97	
L1	3.60	3.84	3.93	
ΦP	3.75	3.84	3.93	
Q	2.60	2.80	3.00	
Q1*	1.73 Ref.			
R*	1.82 Ref.			

**Note:**

1. Package reference: JEDEC To220, variation AB.
2. All Dimensions are in mm.
3. Slot required, Notch may be rounded.
4. Dimension D & E do not include Mold Flash. Mold Flash shall not exceed 0.127 per side. These dimension are measured at the outermost extreme of the Plastic Body.
5. Thermal Pad contour optional within dimension E, H1, D2 & E1.
6. Dimension E2 & H1 define A zone where Stamping and Singulation irregularities are allowed.
7. \*\* is reference.

**Ordering Information**

Part Number	Marking	Package	Packaging Mode
GAS06520A	GAS06520A	TO-220AC	50 pcs / Tube

## Notes

- Global Power Technology reserves the right to change or modify any of the products and their inherent physical and technical specifications without prior notice.
- The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics.

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