V_{RRM}	1200V
I_F	5 A
Q_c	31 nC

Features

- Zero Forward Recovery Voltage
- Zero Reverse Recovery Current
- Excellent Surge Current Capability
- Temperature Independent Switching
- Positive Temperature Coefficient on V_F
- High Frequency Operation

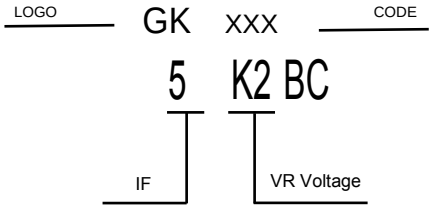
Benefits

- Increased Power Density
- Essentially no Switching Losses
- Reduction of Heat Sink Requirements
- Higher Efficiency
- Reduced EMI

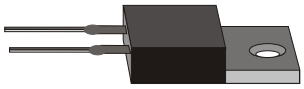
Applications

- Uninterruptible Power Supplies
- Switch Mode Power Supplies
- Power Factor Correction
- Motor Drivers

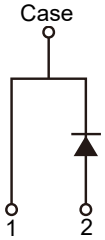
GK XXX
5K2BC



TO-220AC



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Test Conditions	Value	Unit
V_{RRM}	Repetitive Peak Reverse Voltage		1200	V
I_F	Continuous Forward Current	T_c=25°C T_c=135°C T_c=160°C	19 9 5	A
I_{FRM}	Repetitive Forward Surge Current	T_c=25°C, t_p=10ms, Half Sine Wave	55	A
I_{FSM}	Non-Repetitive Forward Surge Current	T_c=25°C, t_p=10ms, Half Sine Wave T_c=150°C, t_p=10ms, Half Sine Wave	65 57	A
$I_{F,max}$	Non-Repetitive Forward Surge Current	T_c=25°C, t_p=10μs, Pulse	655	A
$\int i^2dt$	i^2t Value	T_c=25°C, t_p=10ms T_c=150°C, t_p=10ms	21 16	A^2s
P_{tot}	Power Dissipation	T_c=25°C T_c=110°C	131 57	W
E_{AS}	Non-Repetitive Avalanche Switching Energy	V_{DD}=50V, L=1mH, I_D=14.5A	105	mJ
E_{AR}	Repetitive Avalanche Energy	V_{DD}=50V, L=950μH, I_D=14.5A	99	mJ
T_j	Operating Junction Temperature		-40~175	°C
T_{stg}	Storage Temperature		-40~150	°C
T_{sold}	Soldering Temperature	1.6mm (0.063”) from Case for 10s	260	°C
M	Mounting Torque	M3 Screw	0.7	Nm

ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

Static Characteristics

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
V_{DC}	DC blocking voltage	T_j=25°C	1200			V
V_F	Diode forward voltage	I_F=5A, T_j=25°C I_F=5A, T_j=135°C I_F=5A, T_j=175°C		1.40 1.80 2.11	1.58 2.20 2.66	V
I_R	Reverse current	V_R=1200V, T_j=25°C V_R=1200V, T_j=175°C		1 2	200 400	μA

AC Characteristics

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Q_C	Total capactive charge	V_R=800V, T_j=25°C, $Q_C = \int_0^{V_R} C(V)dV$		31		nC
C	Total capacitance	V_R=1V, f=1MHz V_R=400V, f=1MHz V_R=800V, f=1MHz		288 31 25		pF
E_C	Capacitance stored energy	V_R=800V		9.4		μJ

Thermal Characteristics

Symbol	Parameter	Value			Unit
		Min.	Typ.	Max.	
$R_{th(j-c)}$	Thermal Resistance from Junction to Case		1.14		°C/W

RATING AND CHARACTERISTIC CURVES

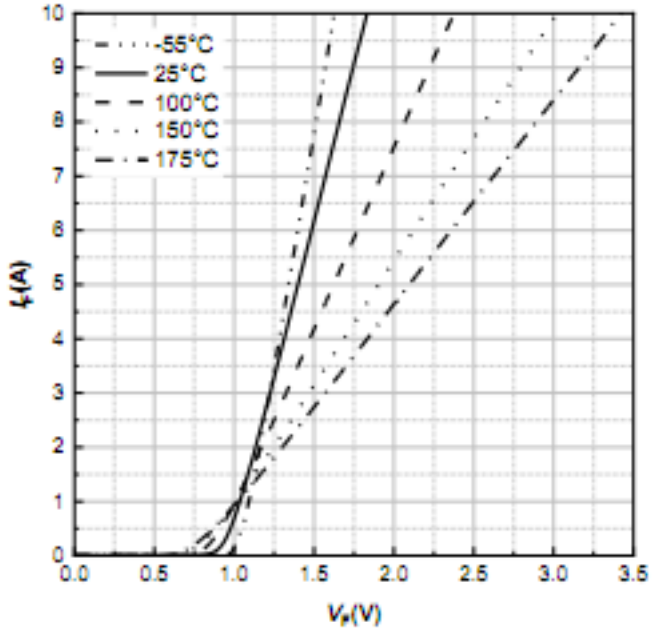


Figure 1. Typical forward characteristics

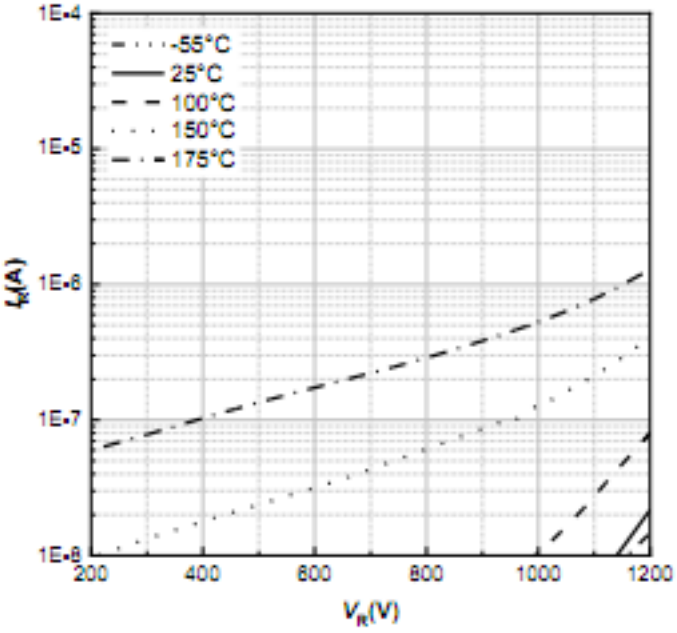


Figure 2. Typical reverse current as function of reverse voltage

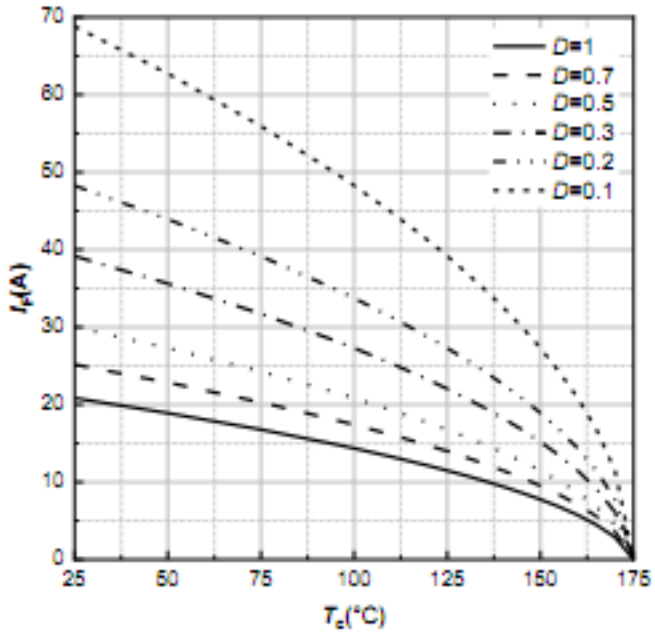


Figure 3. Diode forward current as function of temperature, D=duty cycle

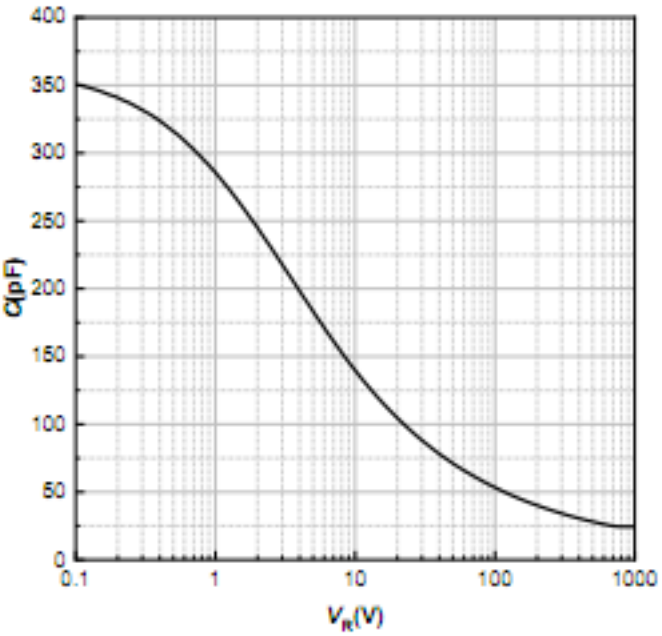


Figure 4. Typical capacitance as function of reverse voltage, C=f(V_R), T_j=25°C, f=1 MHz

RATING AND CHARACTERISTIC CURVES

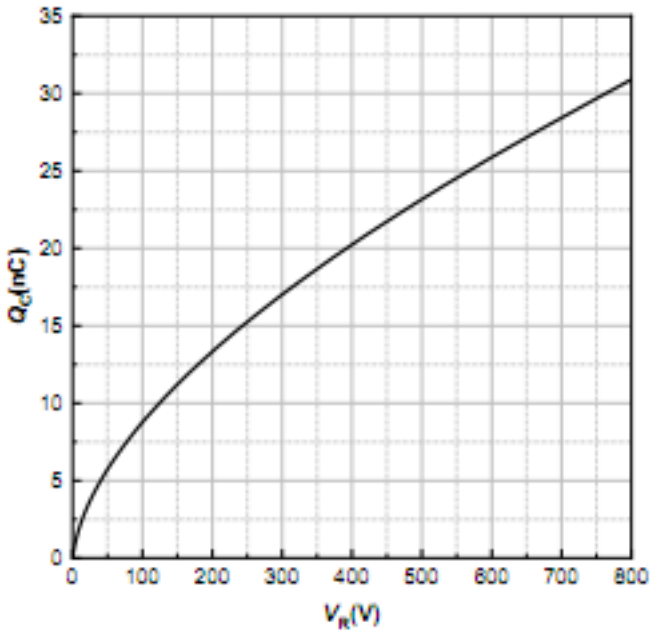


Figure 5. Typical reverse charge as function of reverse voltage

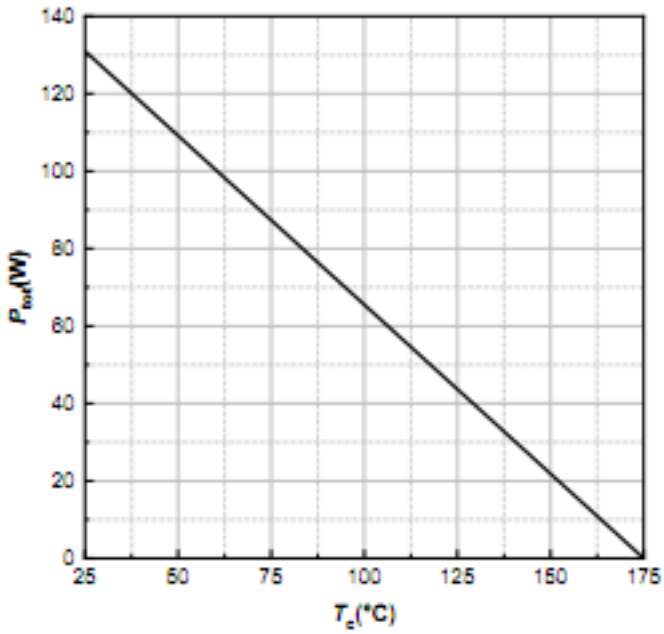


Figure 6. Power dissipation as function of case temperature

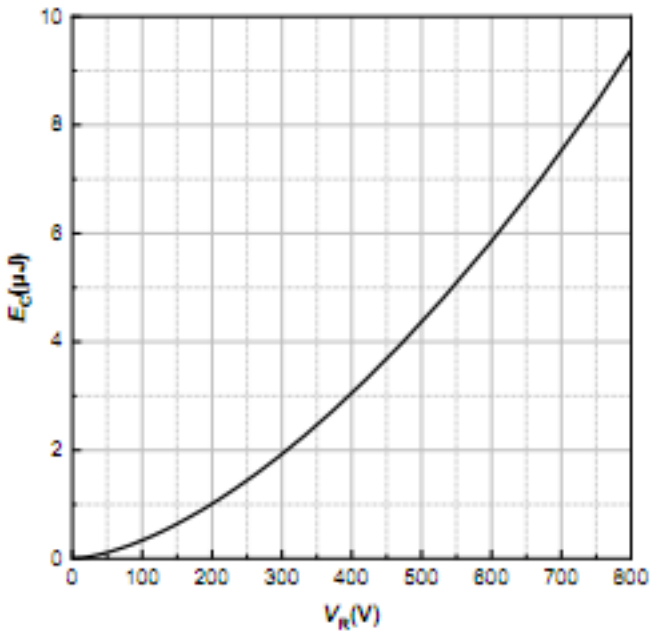


Figure 7. Capacitance stored energy

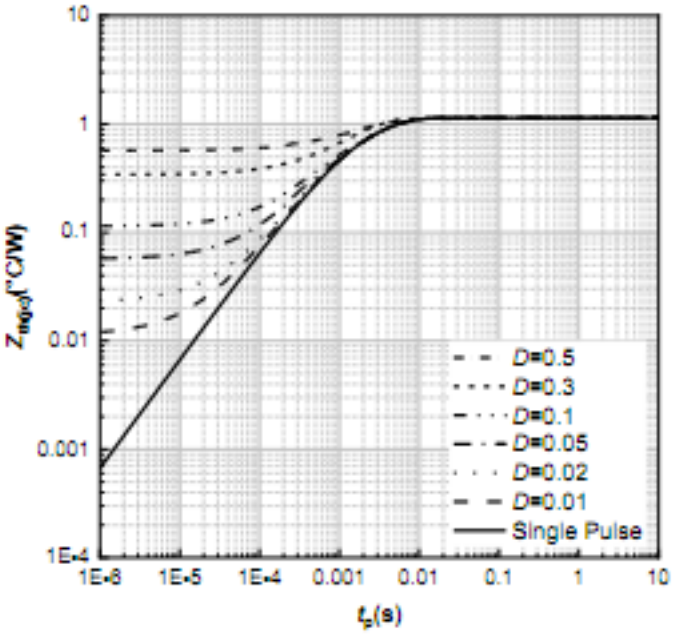
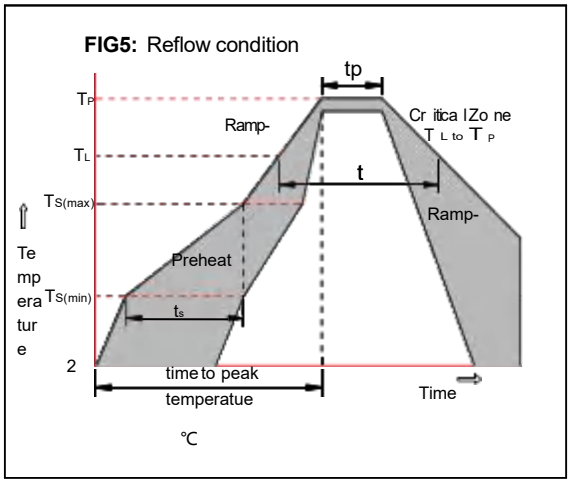


Figure 8. Max. transient thermal impedance, $Z_{th(j-c)} = f(t_p)$, parameter: $D = t_p / T$

Soldering parameters

Reflow Condition		Pb-Free assembly (see as bellow)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150℃
	-Temperature Max($T_{s(max)}$)	+200℃
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3℃/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3℃/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217℃
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_p)		+260(+0/-5)℃
Time within 5℃ of actual Peak Temp (t_p)		30 secs. Max
Ramp-down Rate		6℃/sec. Max
Time 25℃ to Peak Temp (T_P)		8 min. Max
Do not exceed		+260℃



Package Dimensions & Suggested Pad Layout

TO-220AC

