# 3rd Generation thinQ!™ SiC Schottky Diode

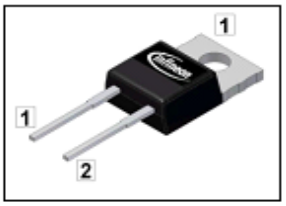
## Features

- Revolutionary semiconductor material - Silicon Carbide
- Switching behavior benchmark
- No reverse recovery / No forward recovery
- Temperature independent switching behavior
- High surge current capability
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC[1)] for target applications
- Optimized for high temperature operation
- Lowest Figure of Merit $Q_C/I_F$

## Product Summary

| | | |
|---|---|---|
| $V_{DC}$ | 1200 | V |
| $Q_C$ | 7.2 | nC |
| $I_F$; $T_C$< 130 °C | 2 | A |

**PG-TO220-2**




**thinQ!™ 3G Diode designed for fast switching applications like:**

- SMPS e.g.; CCM PFC
- Motor Drives; Solar Applications; UPS

| Type | Package | Marking | Pin 1 | Pin 2 |
|---|---|---|---|---|
| IDH02SG120 | PG-TO220-2 | D02G120 | C | A |

**Maximum ratings**

| Parameter | Symbol | Conditions | Value | Unit |
|---|---|---|---|---|
| Continuous forward current | $I_F$ | $T_C$<130 °C | 2 | A |
| Surge non-repetitive forward current, sine halfwave | $I_{F,SM}$ | $T_C$=25 °C, $t_p$=10 ms | 15 | |
| | | $T_C$=150 °C, $t_p$=10 ms | 13 | |
| Non-repetitive peak forward current | $I_{F,max}$ | $T_C$=25 °C, $t_p$=10 µs | 90 | |
| $i^2t$ value | $\int i^2dt$ | $T_C$=25 °C, $t_p$=10 ms | 1.4 | $A^2s$ |
| | | $T_C$=150 °C, $t_p$=10 ms | 1.1 | |
| Repetitive peak reverse voltage | $V_{RRM}$ | $T_j$=25 °C | 1200 | V |
| Diode dv/dt ruggedness | $dv/dt$ | $V_R$= 0….960 V | 50 | V/ns |
| Power dissipation | $P_{tot}$ | $T_C$=25 °C | 75 | W |
| Operating and storage temperature | $T_j$, $T_{stg}$ | | -55 ... 175 | °C |
| Soldering temperature, wavesoldering only allowed at leads | $T_{sold}$ | 1.6mm (0.063 in.) from case for 10s | 260 | |
| Mounting torque | | M3 and M3.5 screws | 60 | Ncm |

| Parameter | Symbol | Conditions | Values | | | Unit |
|---|---|---|---|---|---|---|
| | | | min. | typ. | max. | |
| **Thermal characteristics** | | | | | | |
| Thermal resistance, junction - case | $R_{thJC}$ | | - | - | 2 | K/W |
| Thermal resistance, junction - ambient | $R_{thJA}$ | Thermal resistance, junction- ambient, leaded | - | - | 62 | |
| **Electrical characteristics,** at $T_j$=25 °C, unless otherwise specified | | | | | | |
| **Static characteristics** | | | | | | |
| DC blocking voltage | $V_{DC}$ | $I_R$=0.05 mA, $T_j$=25 °C | 1200 | - | - | V |
| Diode forward voltage | $V_F$ | $I_F$=2 A, $T_j$=25 °C | - | 1.65 | 1.8 | |
| | | $I_F$=2 A, $T_j$=150 °C | - | 2.55 | - | |
| Reverse current | $I_R$ | $V_R$=1200 V, $T_j$=25 °C | - | 2 | 48 | µA |
| | | $V_R$=1200 V, $T_j$=150 °C | - | 8 | 400 | |
| **AC characteristics** | | | | | | |
| Total capacitive charge | $Q_c$ | $V_R$=400 V, $I_F \le I_{F,max}$, $di_F/dt$=200 A/µs, $T_j$=150 °C | - | 7.2 | - | nC |
| Switching time[2] | $t_c$ | | - | - | <10 | ns |
| Total capacitance | $C$ | $V_R$=1 V, $f$=1 MHz | - | 125 | - | pF |
| | | $V_R$=300 V, $f$=1 MHz | - | 12 | - | |
| | | $V_R$=600 V, $f$=1 MHz | - | 10 | - | |

[1] J-STD20 and JESD22

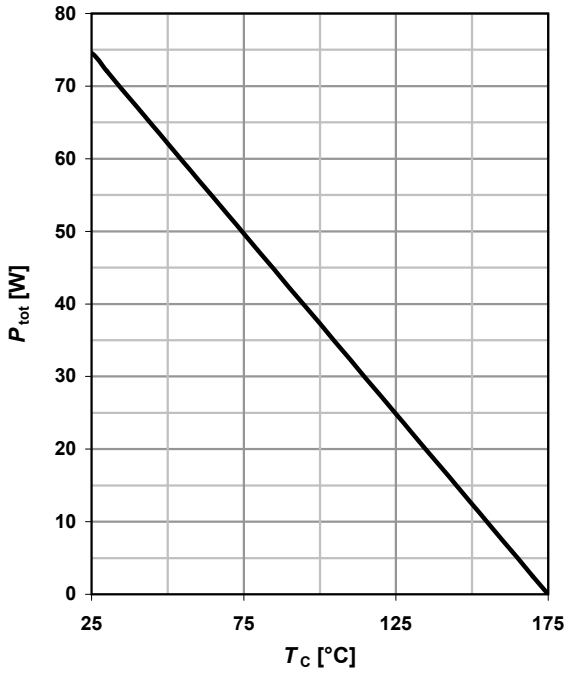
[2] $t_c$ is the time constant for the capacitive displacement current waveform (independent from $T_j$, $I_{LOAD}$ and di/dt), different from $t_{rr}$ which is dependent on $T_j$, $I_{LOAD}$ and di/dt. No reverse recovery time constant $t_{rr}$ due to absence of minority carrier inje

[3] Under worst case $Z_{th}$ conditions.

[4] Only capacitive charge occuring, guaranteed by design

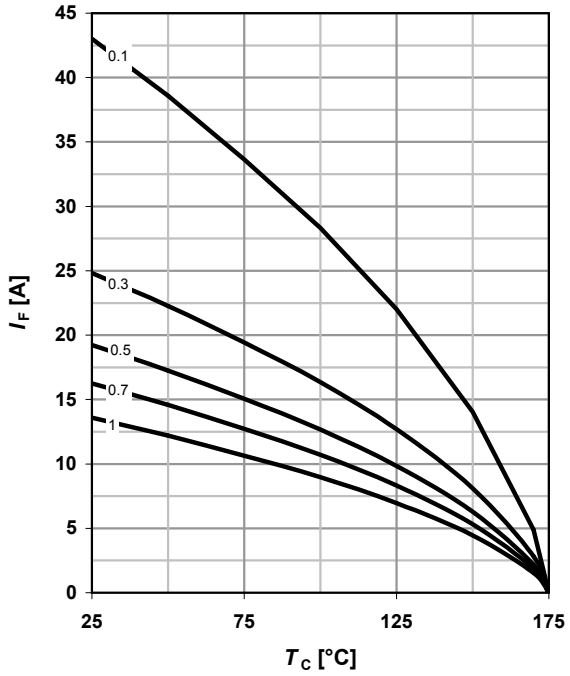
## 1 Power dissipation

$P_{tot}=f(T_C)$




## 2 Diode forward current

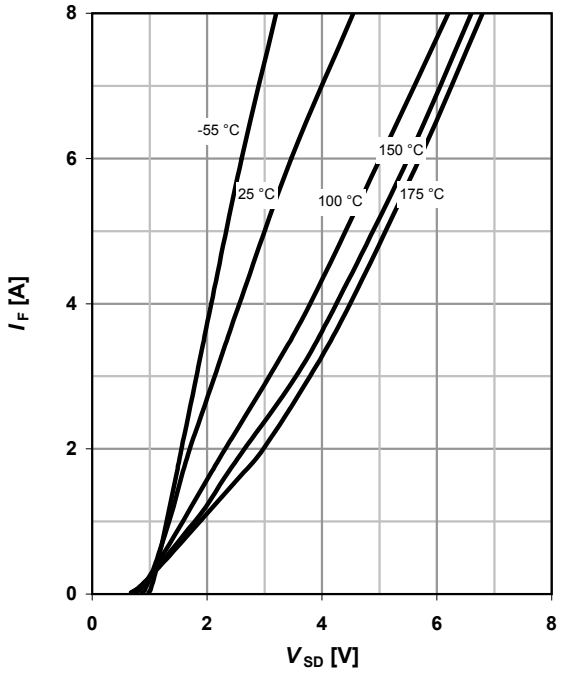
$I_F=f(T_C)$[3]; $T_j \leq 175$ °C; parameter: $D = t_p/T$




## 3 Typ. forward characteristic

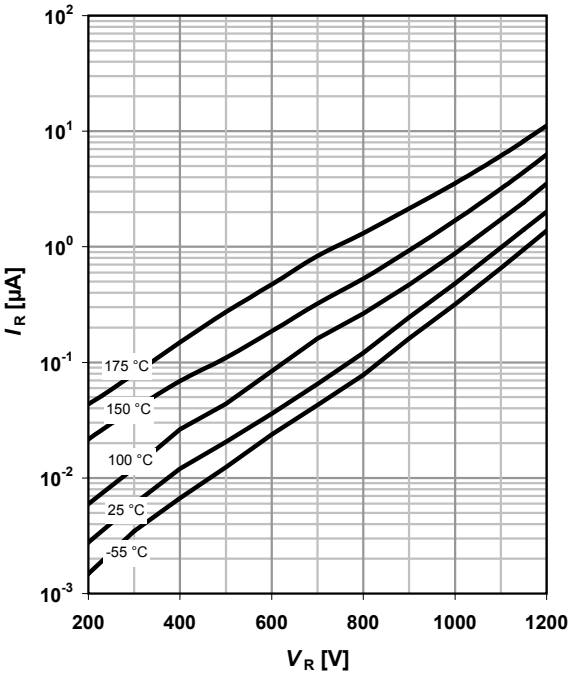
$I_F=f(V_F)$; $t_p=400$ µs

parameter: $T_j$



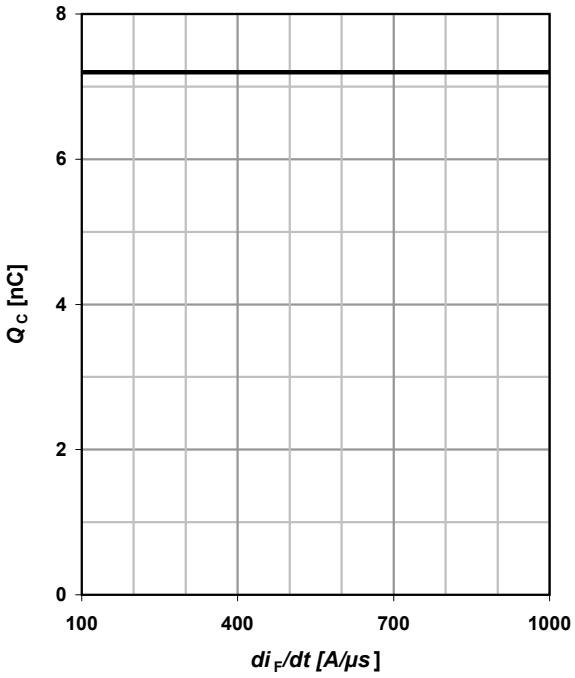

## 4 Typ. Reverse current vs. reverse voltage

$E_C=f(V_R)$



## 5 Typ. capacitance charge vs. current slope

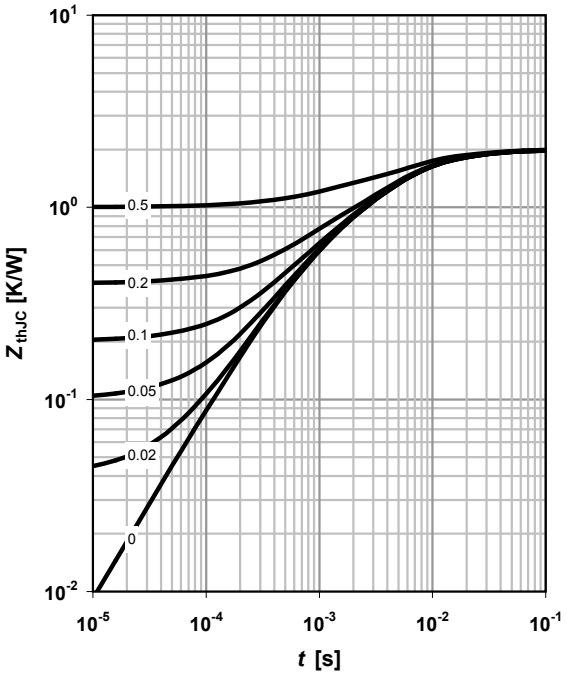
$Q_C=f(di_F/dt)$[4]; $T_j$=150 °C; $I_F \le I_{F,max}$




## 6 Transient thermal impedance

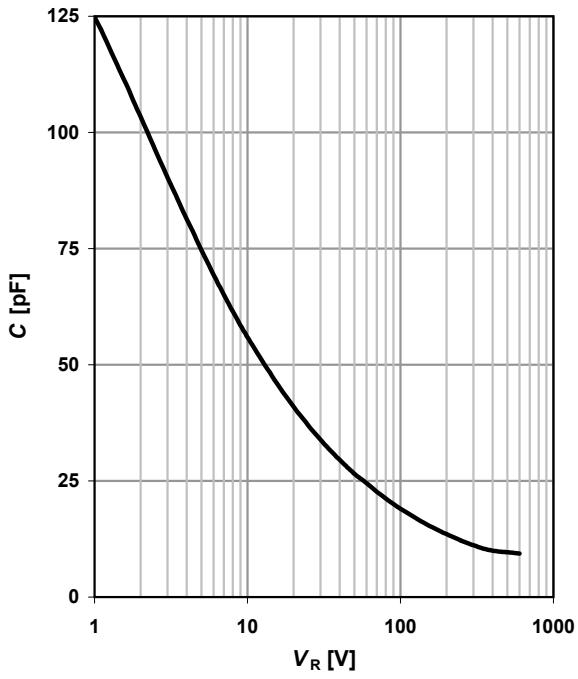
$Z_{thJC}=f(t_p)$

parameter: $D=t_p/T$



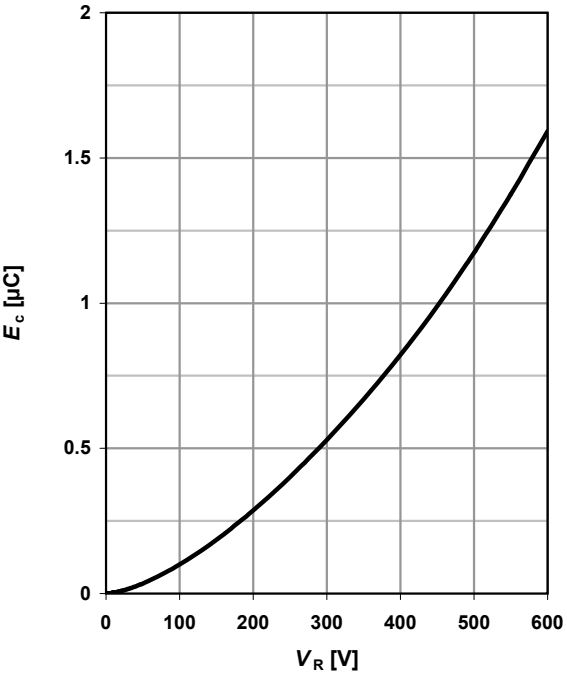

## 7 Typ. capacitance vs. reverse voltage

$C=f(V_R)$; $T_C$=25 °C, $f$=1 MHz

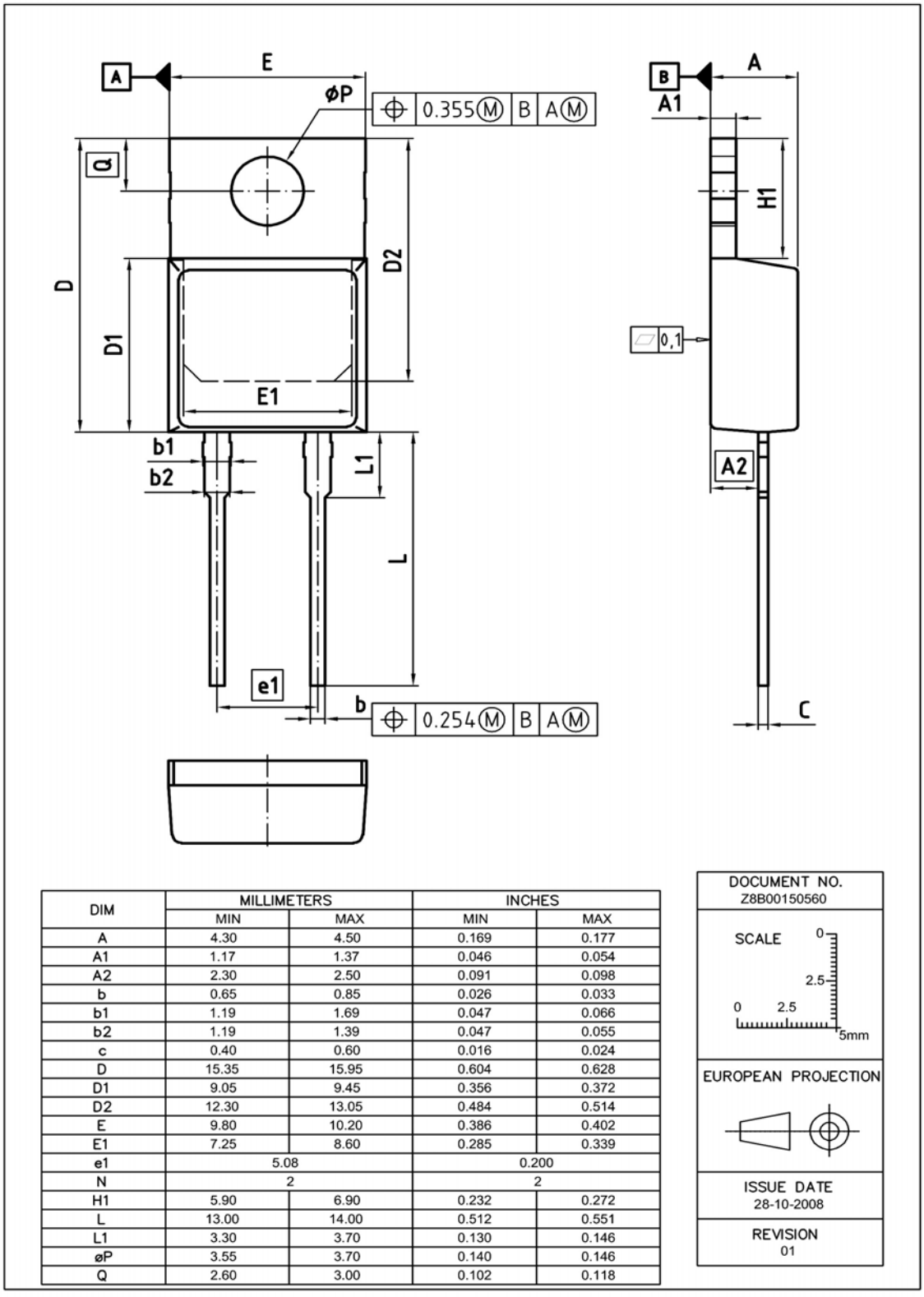



## 8 Typ. $C$ stored energy

$E_C=f(V_R)$



**PG-TO220-2: Outline**




| DIM | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 4.30 | 4.50 | 0.169 | 0.177 |
| A1 | 1.17 | 1.37 | 0.046 | 0.054 |
| A2 | 2.30 | 2.50 | 0.091 | 0.098 |
| b | 0.65 | 0.85 | 0.026 | 0.033 |
| b1 | 1.19 | 1.69 | 0.047 | 0.066 |
| b2 | 1.19 | 1.39 | 0.047 | 0.055 |
| c | 0.40 | 0.60 | 0.016 | 0.024 |
| D | 15.35 | 15.95 | 0.604 | 0.628 |
| D1 | 9.05 | 9.45 | 0.356 | 0.372 |
| D2 | 12.30 | 13.05 | 0.484 | 0.514 |
| E | 9.80 | 10.20 | 0.386 | 0.402 |
| E1 | 7.25 | 8.60 | 0.285 | 0.339 |
| e1 | 5.08 | | 0.200 | |
| N | 2 | | 2 | |
| H1 | 5.90 | 6.90 | 0.232 | 0.272 |
| L | 13.00 | 14.00 | 0.512 | 0.551 |
| L1 | 3.30 | 3.70 | 0.130 | 0.146 |
| øP | 3.55 | 3.70 | 0.140 | 0.146 |
| Q | 2.60 | 3.00 | 0.102 | 0.118 |

DOCUMENT NO.
Z8B00150560

SCALE 0 2.5 0 2.5 5mm

EUROPEAN PROJECTION

ISSUE DATE
28-10-2008

REVISION
01

Dimensions in mm/inches

**We Listen to Your Comments**
Any information within this document that you feel is wrong, unclear or missing at all?
Your feedback will help us to continuously improve the quality of this document.
Please send your proposal (including a reference to this document) to: **erratum@infineon.com**

Edition 2009-08-20
Published by
Infineon Technologies AG
81726 Munich, Germany


**Legal Disclaimer**
The information given in this document shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

**Information**
For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office (**www.infineon.com**).

**Warnings**
Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.
Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.

# X-ON Electronics

Largest Supplier of Electrical and Electronic Components

***Click to view similar products for*** Schottky Diodes & Rectifiers ***category:***

***Click to view products by*** Infineon ***manufacturer:***

Other Similar products are found below :

MA4E2039 D1FH3-5063 MBR0530L-TP MBR10100CT-BP MBR1545CT MMBD301M3T5G RB160M-50TR RB551V-30 BAS16E6433HTMA1 BAT 54-02LRH E6327 NSR05F40QNXT5G NTE555 JANS1N6640 SB07-03C-TB-H SB1003M3-TL-W SK310-T SK32A-LTP SK34B-TP SS3003CH-TL-E GA01SHT18 CRS10I30A(TE85L,QM MA4E2501L-1290 MBRB30H30CT-1G SB007-03C-TB-E SK32A-TP SK33B-TP SK38B-TP NRVBM120LT1G NTE505 NTSB30U100CT-1G SS15E-TP VS-6CWQ10FNHM3 ACDBA1100LR-HF ACDBA1200-HF ACDBA140-HF ACDBA2100-HF ACDBA3100-HF CDBQC0530L-HF CDBQC0240LR-HF ACDBA260LR-HF ACDBA1100-HF SK310B-TP MA4E2502L-1246 MA4E2502H-1246 NRVBM120ET1G NSR01L30MXT5G NTE573 NTE6081 SB560 PMAD1108-LF