

TO-220-2L Plastic-Encapsulate Diode

CSD20H65 Silicon Carbide Schottky Diode

MAIN CHARACTERISTICS

| | |
|---------------------|---|
| I_o | 20A($T_c \leq 141^\circ\text{C}$) |
| V_{RRM} | 650V |
| T_j | 175 $^\circ\text{C}$ |
| $V_{F(\text{typ})}$ | 1.35V (@ $T_j=25^\circ\text{C}$) 1.75V (@ $T_j=175^\circ\text{C}$) |

FEATURES

- Zero Reverse Recovery Current
- Zero Forward Recovery Voltage
- Temperature-independent performance
- High-speed switching
- Low switching loss
- Low Leakage Current

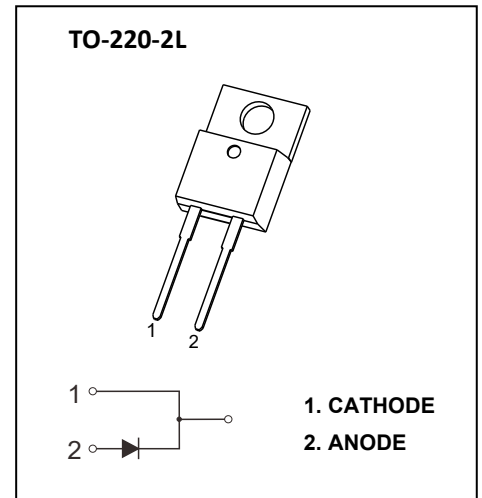
Application

- Industrial Power Supplies
- Power factor correction
- Motor drive traction
- EV charging station
- Solar Inverters

MARKING



CSD20H65 = Device code
 Solid dot = Green molding compound device
 if none, the normal device
 XXXX = Code



MAXIMUM RATINGS ($T_j=25^\circ\text{C}$ unless otherwise noted)

| Symbol | Parameter | Value | Unit | |
|-----------------|---|------------------------------|---------------------------|---|
| V_{RRM} | Peak repetitive reverse voltage | 650 | V | |
| V_{RWM} | Working peak reverse voltage | | | |
| V_R | DC blocking voltage | | | |
| $I_{F(AV)}$ | Average Forward Current | $T_c \leq 25^\circ\text{C}$ | 47 | A |
| | | $T_c \leq 100^\circ\text{C}$ | 31 | A |
| | | $T_c \leq 141^\circ\text{C}$ | 20 | A |
| I_{FSM} | Non-Repetitive peak forward surge current (10ms half sine wave) | 172 | A | |
| $\int i^2 dt$ | $\int i^2 dt$ value ($t_p=10\text{ms}$) | 148 | A^2s | |
| P_D | Power dissipation | 150 | W | |
| $R_{\theta JC}$ | Thermal Resistance From Junction to Case | 1.0 | $^\circ\text{C}/\text{W}$ | |
| T_j | Junction temperature | -55~175 | $^\circ\text{C}$ | |
| T_{stg} | Storage temperature | -55~175 | $^\circ\text{C}$ | |

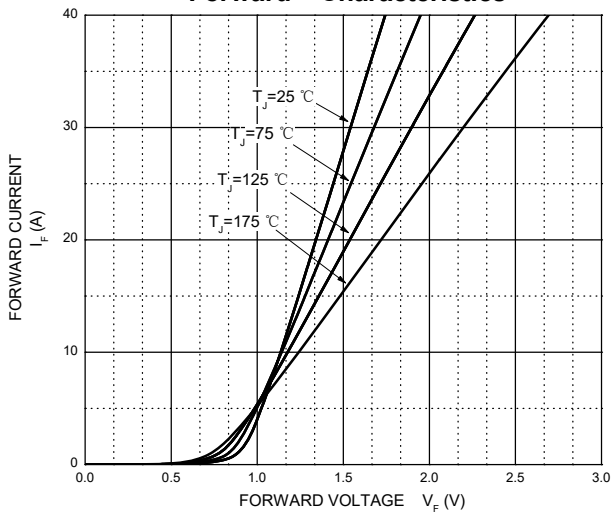
Typical Characteristics

ELECTRICAL CHARACTERISTICS($T_j=25^{\circ}\text{C}$ unless otherwise specified)

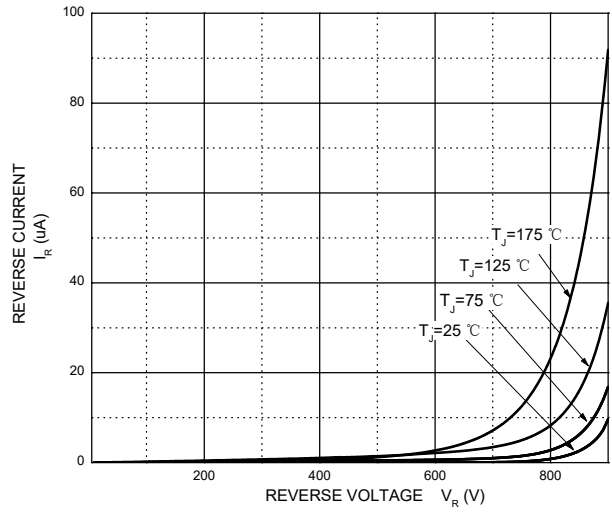
| Parameter | Symbol | Test conditions | Min | Typ | Max | Unit |
|---------------------------|------------|--|---------------------------|------|-----|---------------|
| Reverse voltage | $V_{(BR)}$ | $I_R=100\mu\text{A}$ | 650 | | | V |
| Reverse current | I_R | $V_R=650\text{V}$ | $T_j=25^{\circ}\text{C}$ | 2 | 20 | μA |
| | | | $T_j=175^{\circ}\text{C}$ | 20 | 200 | μA |
| Forward voltage | V_F | $I_F=20\text{A}$ | $T_j=25^{\circ}\text{C}$ | 1.35 | 1.7 | V |
| | | | $T_j=175^{\circ}\text{C}$ | 1.75 | 2.2 | V |
| Total capacitance | C | $V_R=0\text{V}, f=1\text{MHz}$ | | 1140 | | pF |
| | | $V_R=200\text{V}, f=1\text{MHz}$ | | 110 | | pF |
| | | $V_R=400\text{V}, f=1\text{MHz}$ | | 107 | | pF |
| Total capacitive charge | Q_C | $V_R=400\text{V}$ $Q_C=\int_0^{V_R} C(V)dV$ | | 64 | | nC |
| Capacitance Stored Energy | E_C | $V_R=400\text{V}$ $E_C=\int_0^{V_R} C(V) \cdot VdV$ | | 11 | | μJ |

Typical Characteristics

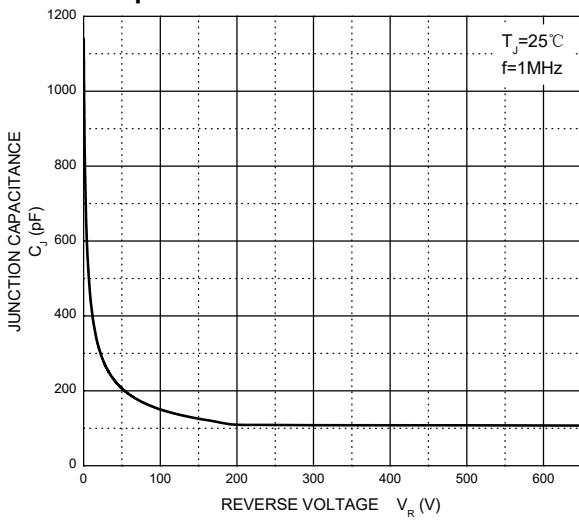
Forward Characteristics



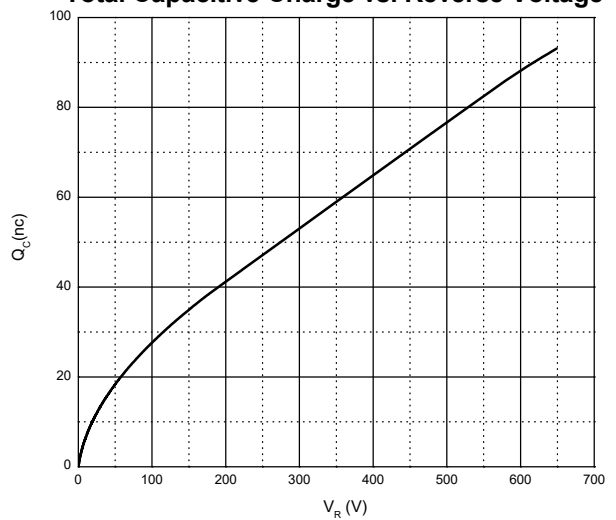
Reverse Characteristics



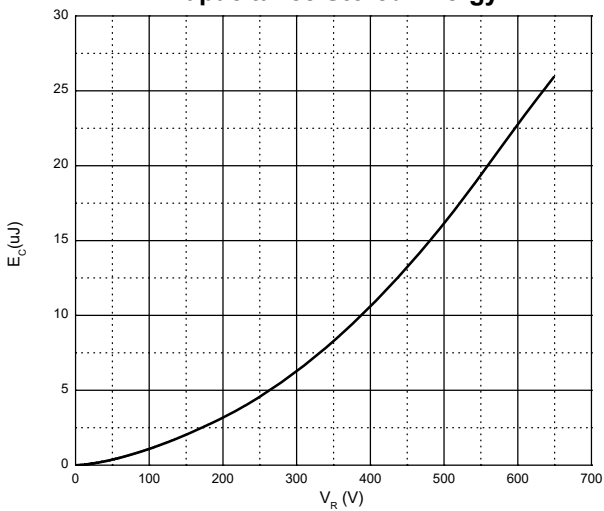
Capacitance Characteristics Per Diode



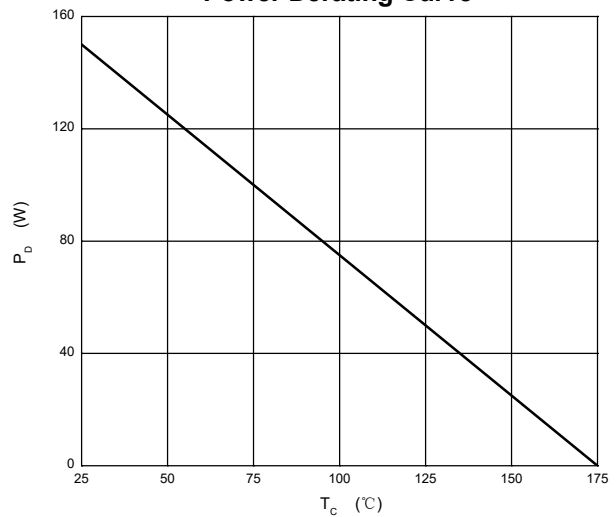
Total Capacitive Charge vs. Reverse Voltage



Capacitance Stored Energy

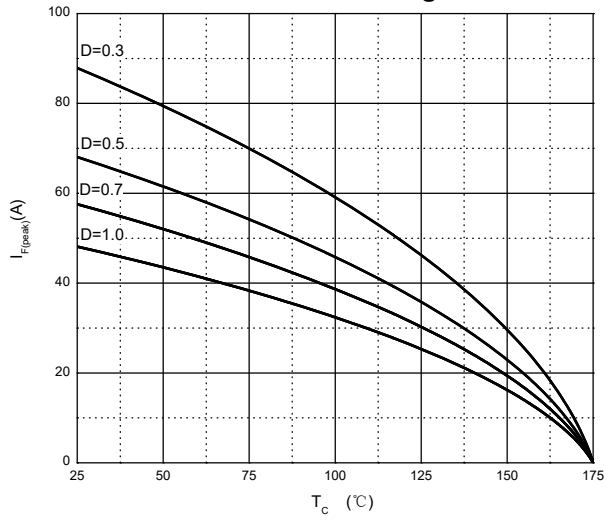


Power Derating Curve

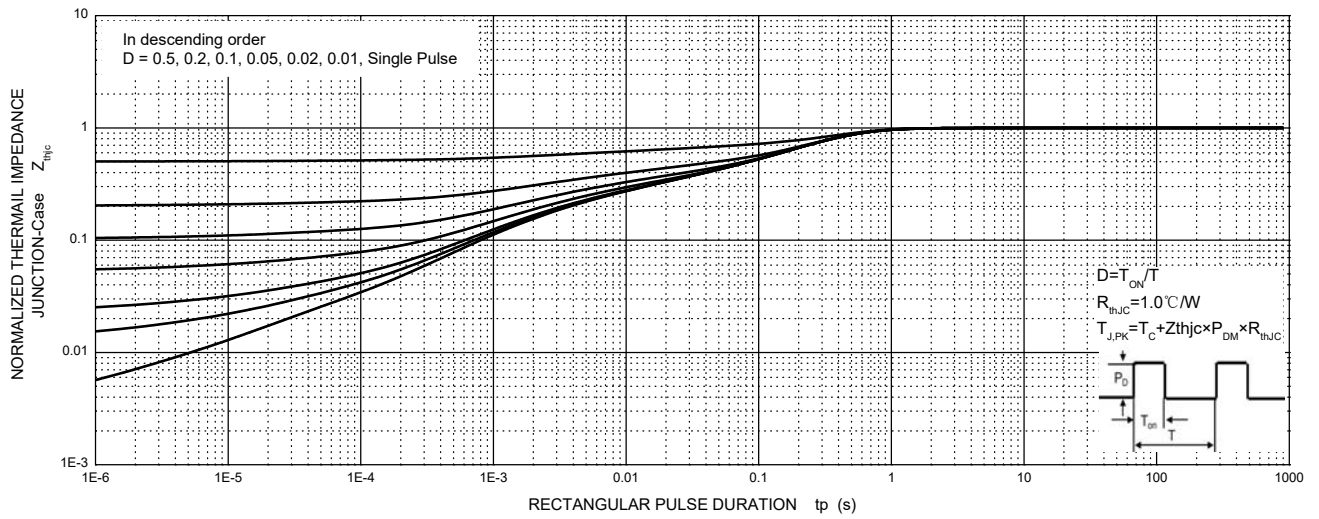


Typical Characteristics

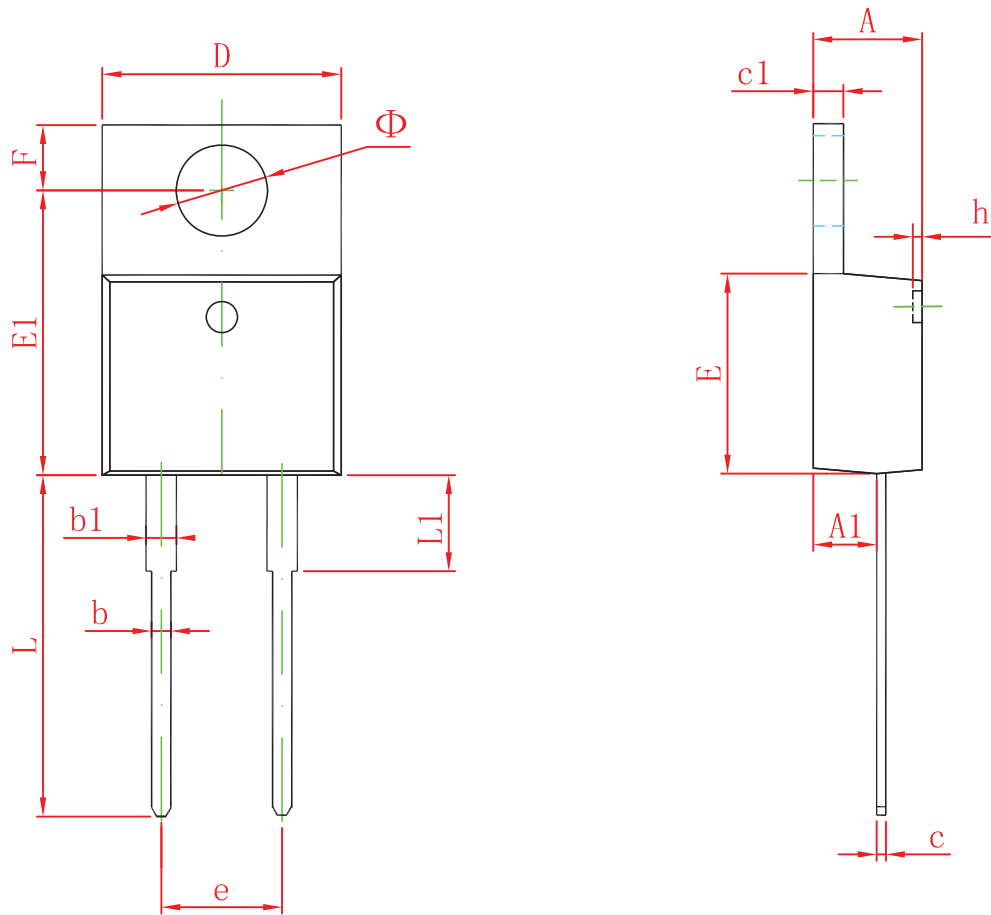
Current Derating



CSD20H65 Transient Thermal Impedance, Junction-Case



TO-220-2L PACKAGE OUTLINE DIMENSIONS



| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|--------|---------------------------|--------|----------------------|-------|
| | Min | Max | Min | Max |
| A | 4.450 | 4.750 | 0.175 | 0.187 |
| A1 | 2.520 | 2.820 | 0.099 | 0.111 |
| b | 0.710 | 0.910 | 0.028 | 0.036 |
| b1 | 1.170 | 1.370 | 0.046 | 0.054 |
| c | 0.300 | 0.500 | 0.012 | 0.020 |
| c1 | 1.170 | 1.370 | 0.046 | 0.054 |
| D | 9.830 | 10.330 | 0.387 | 0.407 |
| E | 8.500 | 8.900 | 0.335 | 0.350 |
| E1 | 12.050 | 12.650 | 0.474 | 0.498 |
| e | 5.080 TYP | | 0.200 TYP | |
| F | 2.540 | 2.940 | 0.100 | 0.116 |
| h | 0.100 TYP | | 0.004 TYP | |
| L | 13.300 | 13.800 | 0.523 | 0.543 |
| L1 | 3.540 | 3.940 | 0.139 | 0.155 |
| Φ | 3.735 | 3.935 | 0.147 | 0.155 |