

## IGBT BASED DC SOLID-STATE RELAY



- ▶ Latest high voltage IGBT technology generation.
- ▶ New innovative isolated driver ensuring fast power transistor turn on and off therefore low power transient.
- ▶ Ultra low output leakage current
- ▶ Low control current consumption
- ▶ Triggered control input to avoid linear control risks
- ▶ Low conducted and radiated disturbances

### SCI0501200



|                                    |                                          |
|------------------------------------|------------------------------------------|
| Control voltage range              | 4.5-32VDC                                |
| Max transient peak voltage         | 1200v                                    |
| Advised max. DC Mains peak voltage | (Depends on protection clamping voltage) |
| Max. Load Current (with heatsink)  | 50ADC                                    |

| DC Mains voltage range                   | Load current range       | Control input voltage range | In & case / Out Insulation | Connections                    | Dimensions (WxHxD)    | Weight |
|------------------------------------------|--------------------------|-----------------------------|----------------------------|--------------------------------|-----------------------|--------|
| (Depends on protection clamping voltage) | 0 to 50A (with heatsink) | 4.5-32VDC                   | 4kV                        | M3 round tabs<br>M5 round tabs | 44.5 x 58.2 x 27 (mm) | 100g   |

Fig. 1

#### HIGH SIDE WIRING DIAGRAM (Load connected to “-“)

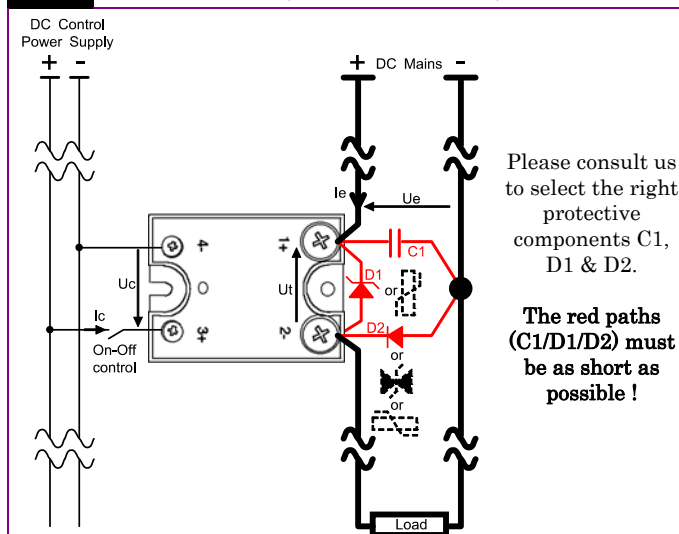


Fig. 2

#### LOW SIDE WIRING DIAGRAM (Load connected to “+“)

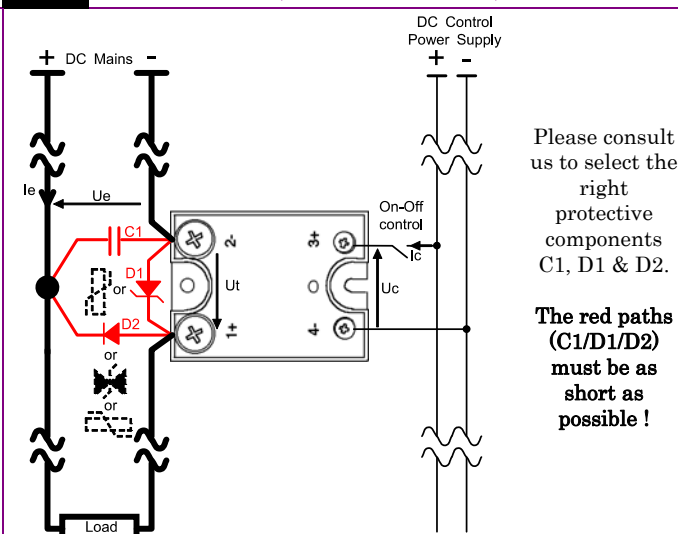
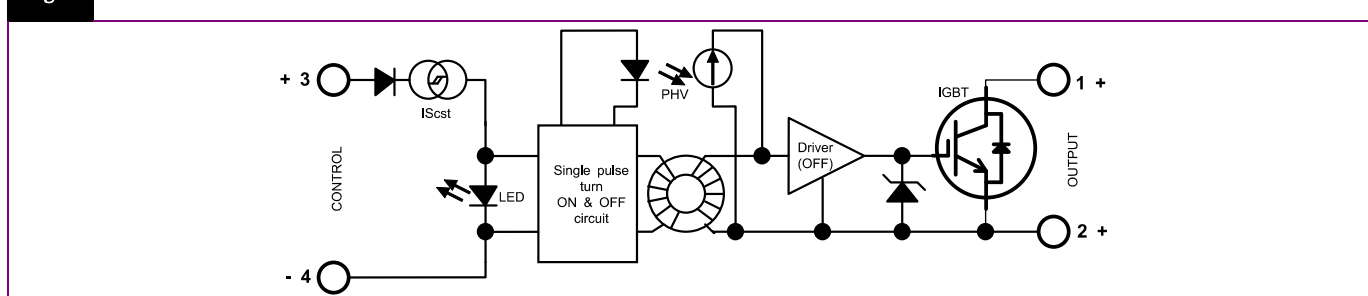


Fig. 3

#### INTERNAL DIAGRAM



*Proud to serve you*

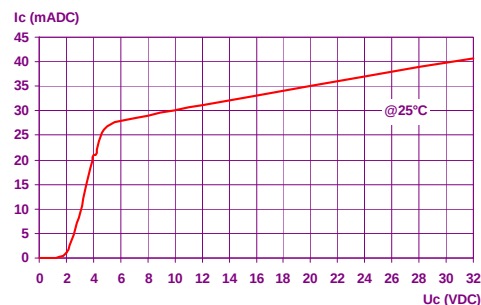
Data given at Tambient=25°C and subject to modification without previous notice

# celduc®

r e l a i s

## CONTROL INPUT CHARACTERISTICS

| INPUT CIRCUIT | CHARACTERISTIC               | LABEL         | VALUE              | INFO.                  | Fig. 4 | CONTROL CURRENT vs. CONTROL VOLTAGE |
|---------------|------------------------------|---------------|--------------------|------------------------|--------|-------------------------------------|
|               | Nom. Control voltage         | $U_{Cnom}$    | 12-24VDC           |                        |        |                                     |
|               | Nom. Control current         | $I_{Cnom}$    | 35mADC             |                        |        |                                     |
|               | Control voltage range        | $U_c$         | 4.5 – 32VDC        | typical=4.3V           |        |                                     |
|               | Control current consumption  | $I_c$         | 25 – 42mADC        | See curve              |        |                                     |
|               | Releasing control voltage    | $U_{Coffmax}$ | 1VDC               | Typical= 3.5V          |        |                                     |
|               | Max. reverse control voltage | $-U_{Cmax}$   | 32VDC              | $-I_{Cmax} < 100\mu A$ |        |                                     |
|               | Input impedance              | $R_{in}$      | Current limitation | See curve              |        |                                     |



## TIME CHARACTERISTICS

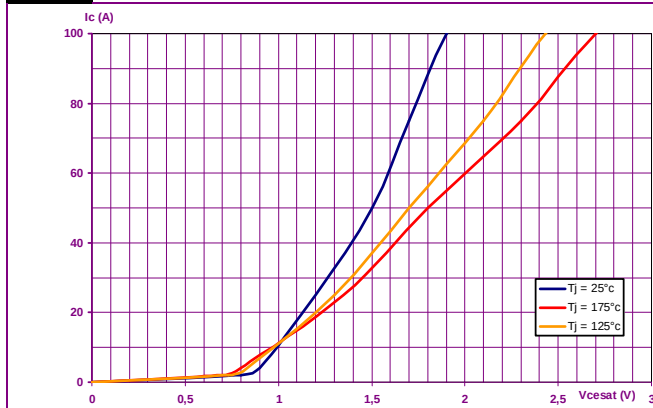
| TIME CHARACT. | CHARACTERISTIC        | LABEL          | VALUE       |  |  |
|---------------|-----------------------|----------------|-------------|--|--|
|               | Turn on time          | $t_{on}$       | 10 $\mu$ s  |  |  |
|               | Turn on delay         | $t_{don}$      | 600 $\mu$ s |  |  |
|               | Turn off time         | $t_{off}$      | 50 $\mu$ s  |  |  |
|               | Turn off delay        | $t_{doff}$     | 100 $\mu$ s |  |  |
|               | Max. On-Off frequency | $F_{(on-off)}$ | 200Hz       |  |  |

## POWER OUTPUT CHARACTERISTICS

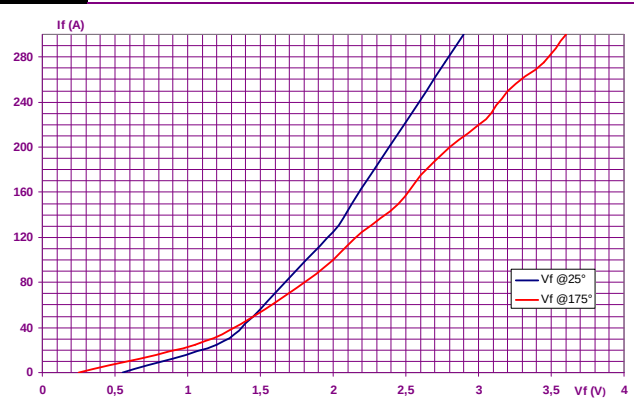
| POWER CIRCUIT | CHARACTERISTIC                                              |  | LABEL                 | VALUE                                                                                                  |                            | INFO.                                                              |
|---------------|-------------------------------------------------------------|--|-----------------------|--------------------------------------------------------------------------------------------------------|----------------------------|--------------------------------------------------------------------|
|               | Mains voltage range                                         |  | $U_t$   $U_e$         | Min = $V_{CEsat}$<br>Max (Advised) = 650VDC                                                            |                            | Depends on protection clamping voltage (D1)                        |
|               | Non-repetitive peak voltage                                 |  | $U_{tp}$              | 1200V                                                                                                  |                            |                                                                    |
|               | Overvoltage protection                                      |  | D1                    | Not integrated<br>A voltage clamping mean must be connected across the terminals 1 & 2 (see fig 1 & 2) |                            | Please consult us to select the right protective components        |
|               | Off-state max reverse voltage drop (internal diode)         |  | $-U_t$                | 1.4V                                                                                                   |                            | @ $I_e=50A$                                                        |
|               | Maximum nominal currents                                    |  | $I_e \text{ max}$     | Resistive                                                                                              | Motor                      | See fig. 9                                                         |
|               |                                                             |  |                       | 50A                                                                                                    | Please contact us          |                                                                    |
|               | Max. non-repetitive non-switched peak current               |  | $I_{epeak}$           | 320A                                                                                                   |                            | @ $T_c=100^\circ C$ @ $T_j=175^\circ C$<br>@ $U_{tp}$ (See fig. 8) |
|               | Min. load current                                           |  | $I_{emin}$            | 0mA                                                                                                    |                            | @ $T_j=25^\circ C$                                                 |
|               | Max. leakage current                                        |  | $I_{elk \text{ max}}$ | 1mA                                                                                                    |                            | @ $U_{tp}$ @ $T_{jmax}$                                            |
|               | Voltage drop : Resistance                                   |  | $r_t$                 | 9m $\Omega$                                                                                            |                            | @ $T_j=125^\circ C$                                                |
|               | Voltage drop : Voltage                                      |  | $v_t$                 | 0.8V                                                                                                   |                            | @ $T_j=125^\circ C$                                                |
|               | Max. on-state voltage ( $V_{cesat} = v_t + r_t \cdot I_e$ ) |  | $V_{CEsat}$           | 1.5V @ $T_j=25^\circ C$                                                                                | 1.7V @ $T_j=125^\circ C$   | @ $I_{emax}$                                                       |
|               |                                                             |  |                       |                                                                                                        |                            |                                                                    |
|               | Typ. output capacitance                                     |  | $C_{out}$             | 300pF                                                                                                  |                            | @ $U_{tp}$                                                         |
|               | Junction/case thermal resistance                            |  | $R_{thjc}$            | 0.365K/W                                                                                               |                            |                                                                    |
|               | Built-in heatsink thermal resistance vertically mounted     |  | $R_{thra}$            | 10K/W                                                                                                  |                            | @ $\Delta T_{ra}=75^\circ C$                                       |
|               | Heatsink thermal time constant                              |  | $T_{thra}$            | 10 minutes                                                                                             |                            | @ $\Delta T_{ra}=60^\circ C$                                       |
|               | Control inputs / power outputs / case insulation voltage    |  | $U_{imp}$             | 4kV                                                                                                    |                            |                                                                    |
|               | Isolation resistance / capacitance                          |  | $R_{io} / C_{io}$     | 1G $\Omega$ / <8pF                                                                                     |                            |                                                                    |
|               | Maximum junction temperature                                |  | $T_{jmax}$            | Steady state = 125 $^\circ C$                                                                          | Transient = 175 $^\circ C$ |                                                                    |
|               | Storage ambient temperature                                 |  | $T_{stg}$             | -40->+100 $^\circ C$                                                                                   |                            |                                                                    |
|               | Operating ambient temperature                               |  | $T_{amb}$             | -40->+90 $^\circ C$                                                                                    |                            | See fig. 9                                                         |
|               | Max. case temperature                                       |  | $T_c$                 | 100 $^\circ C$                                                                                         |                            |                                                                    |

## OUTPUT SWITCH CHARACTERISTIC CURVES

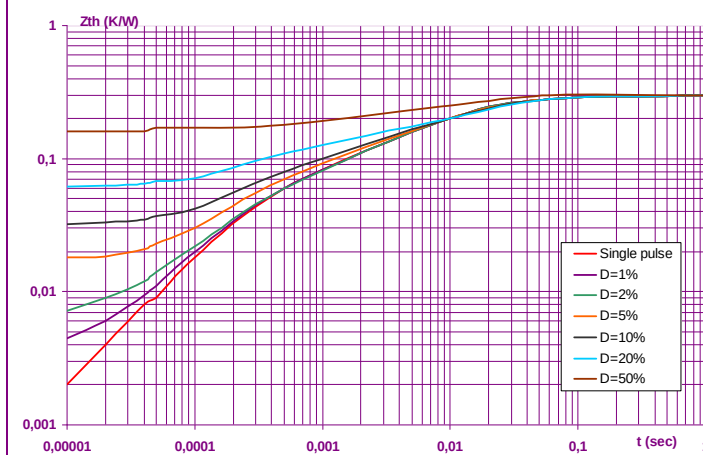
**Fig. 5** VOLTAGE DROP VS LOAD CURRENT



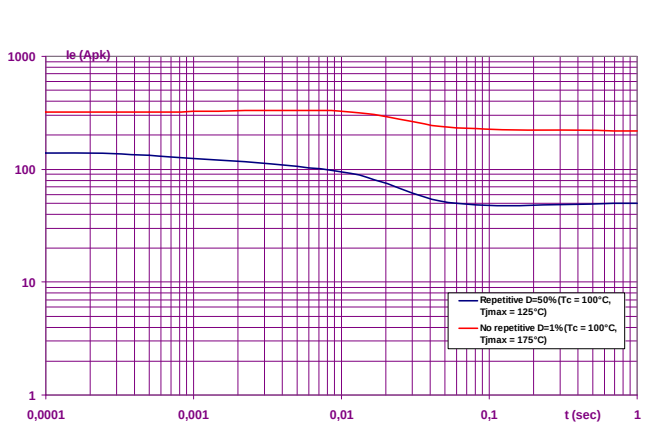
**Fig. 6** REVERSE VOLTAGE DROP VS REVERSE CURRENT



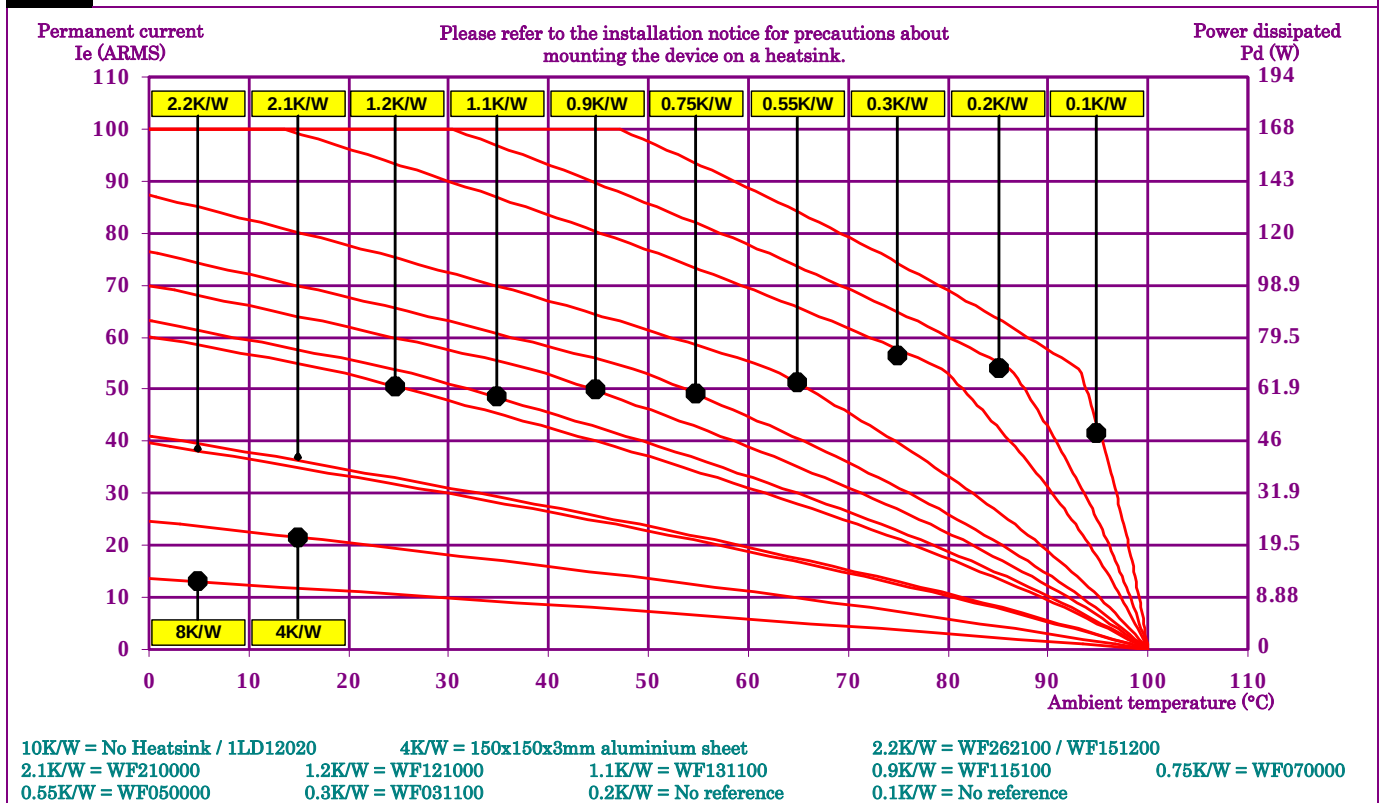
**Fig. 7** POWER ELEMENT TRANSIENT THERMAL IMPEDANCE vs. PULSE DURATION



**Fig. 8** ON-STATE PEAK OVERLOAD CURRENT vs. PULSE DURATION



**Fig. 9** POWER DISSIPATED AND LOAD CURRENT LIMIT VS TEMPERATURE



**GENERAL INFORMATION**

|                    |                                                     |  |              |                |  |
|--------------------|-----------------------------------------------------|--|--------------|----------------|--|
| <b>CONNECTIONS</b> | Connections                                         |  | <b>Power</b> | <b>Control</b> |  |
|                    | Screwdriver advised                                 |  | Philips™ NR2 | Philips™ NR1   |  |
|                    | Min and max tightening torque                       |  | 1.8 N.m      | 0.8 N.m        |  |
|                    | Insulated crimp terminals (round tabs, eyelet type) |  | M5           | M3             |  |

|              |             |  |                                                          |  |                    |
|--------------|-------------|--|----------------------------------------------------------|--|--------------------|
| <b>MISC.</b> | Display     |  | Green LED<br>(indicates the power element is controlled) |  |                    |
|              | Housing     |  | UL94V0                                                   |  |                    |
|              | Mounting    |  | 2 screws (M4x12mm)                                       |  | See mounting sheet |
|              | Noise level |  | No audible noise                                         |  |                    |
|              | Weight      |  | 100g                                                     |  |                    |

**STANDARDS**

|                |                                 |  |            |  |
|----------------|---------------------------------|--|------------|--|
| <b>GENERAL</b> | Standards                       |  | IEC60947-1 |  |
|                | Protection level                |  | IP00       |  |
|                | Protection against direct touch |  | None       |  |
|                | CE marking                      |  | Yes        |  |
|                | UL, cULUS                       |  | Yes        |  |

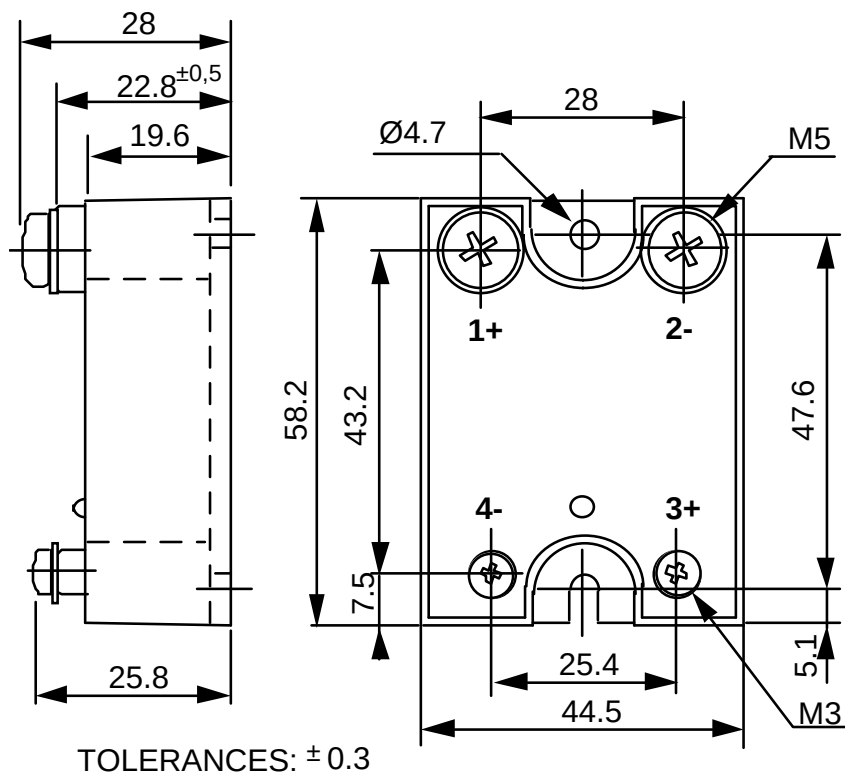
|                        |                                   |                 |              |               |
|------------------------|-----------------------------------|-----------------|--------------|---------------|
| <b>E.M.C. IMMUNITY</b> | <b>TYPE OF TEST</b>               | <b>STANDARD</b> | <b>LEVEL</b> | <b>EFFECT</b> |
|                        | E.S.D. (Electrostatic discharges) | EN61000-4-2     | Pending      | ?             |
|                        | Radiated electromagnetic fields   | EN61000-4-3     | Pending      | ?             |
|                        | Fast transients bursts            | EN61000-4-4     | Pending      | No effect     |
|                        | Electric chocks                   | EN61000-4-5     | Pending      | ?             |
|                        | Voltage drop                      | EN61000-4-11    | -            |               |

|                        |                                     |           |         |  |
|------------------------|-------------------------------------|-----------|---------|--|
| <b>E.M.C. EMISSION</b> | Radiated and conducted disturbances | NFEN55011 | Pending |  |
|------------------------|-------------------------------------|-----------|---------|--|

## DIMENSIONS AND ACCESSORIES

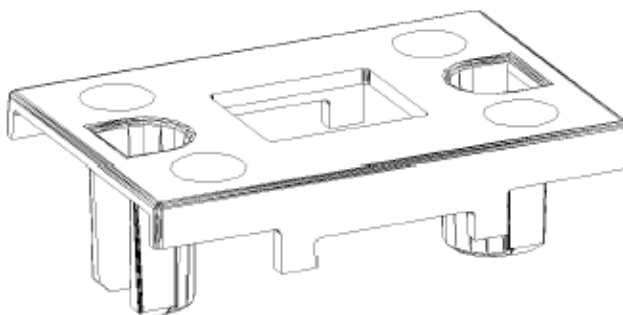
Fig.  
10

DIMENSIONS (mm)



### ACCESSORIES

#### PROTECTIVE COVER 1K470000



Please consult our website for other accessory references  
(Heatsinks, mounting adaptors, thermal grease...)