

HF Modem

2G ALE

3G ALE

V/UHF Modem

56b, 2400 Vocoder



Fig 1.a:
TC2 Top view

Size:
22 x 33 mm x 3.5 mm



Fig 1.b:
TC2 Bottom view

(Actual Size)

FEATURES & BENEFITS:

- **3G ALE:** STANAG 4538 Fast Link Setup (FLSU)
- **xDL Packet Modem:** Built-in ARQ
- **Radio Control:** Transceiver Protocol
- **Low Cost:** Hardware Installation
- **Activation Keys:** Unlock Functionality
- **Low Power:** 600 mW (typical)
- **Compact Size:** 22 x 33 x 3.5 mm

OTHER SOFTWARE OPTIONS (DATASHEETS AVAILABLE):

- **HF Modem:** Up to 9 600 bps SSB, 19 200 bps ISB
- **MIL-STD 110C Modes:** 32,000 bps in 6 kHz
- **2G ALE:** MIL-STD-188-141B/C App A & B
- **Digital Voice:** 2400 bps Vocoder
- **Encryption:** 56-bit for Data/Voice
- **VHF / UHF Modem:** Up to 128 000 bps (24 kHz)

RELATED PRODUCTS (DATASHEETS AVAILABLE):

- **EF-256 Embedded Functions for Secure Voice & Data:**
 - AES-256 Encryption
 - Vocoder (600 – 2400 bps) TWELP* or MELPe**
 - AUTO Data Rate Change
 - Best-in-class Voice Modem
 - Extended Range, const. amplitude modulation

* TWELP voice coding by DSP Innovations Inc.(www.dspini.com)

** MELPe for US customers only

TC2 HARDWARE MODULE

The TC2 is optimized for size and provides very low power consumption. It is intended for integration into HF & V/UHF transceivers. This hardware platform can host a number of S/W functions, 3G ALE, for example.

3RD GENERATION ALE FOR HF

The STANAG 4538 Fast Link Setup (FLSU) and Packet Data (xDL) is available as software options for the **TC2** module. It is intended for integration into HF transceivers and other communication devices. 3G ALE is the best choice for interoperating advanced HF data and voice services, especially in adverse channel conditions. 3G ALE has an integrated *Radio Control Manager (RCM)* which can provide control for a large number of radios. Please contact *RapidM* for more details.

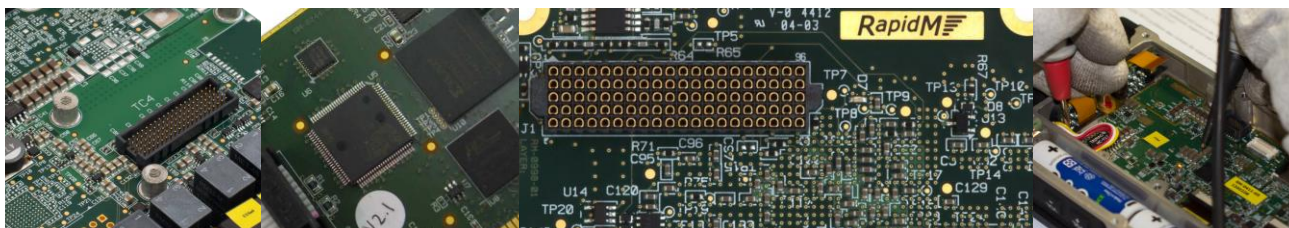
FAST LINK SETUP – STANAG 4538

In a single channel environment, 3G ALE / STANAG 4538 function offers very robust selective calling in support of data applications and voice. In a multi-channel environment, the effective bandwidth is also increased.

3G ALE offers more robust link setup compared with 2G ALE.

PACKET DATA – OPTION

The xDL option offers a adaptive robust packet data modem with very effective ARQ, especially for penetration of noisy and congested channels.



TC2 HARDWARE

| TC2 HARDWARE | |
|--------------|--|
| SIZE | 22 x 33 x 3.5 mm (w x d x h) |
| POWER | 3.3 VDC, (Hunt < 650 mW), (Deep-Sleep < 50 mW), (Off < 1 mW) |
| TEMPERATURE | -40°C to +85°C (operating); -40°C to +85°C (storage) |
| CONNECTORS | 3x40-way fine pitch connector, Module Side: Hirose DF40C-40DP-0.4V(51), Host Side: DF40C-40DS-0.4V(51) |

*Contact RapidM for Datasheets on interface description

3G ALE / S4538 GENERAL

| GENERAL | |
|-------------------------|---|
| STANDARD | STANAG 4538 Compliant |
| INTEROPERABILITY | Tested |
| CONFIGURATION & CONTROL | Protocol: RAP1/RIPC (RapidM Proprietary). Persistent configuration (via EEPROM (last MIB), via FLASH (MIB presets)). |
| RADIO CONTROL | |
| PROTOCOL | RAP1/RIPC, or Transceiver Protocol (custom implementation possible) |

3G ALE / STANAG 4538 FLSU – OPTION

| STANAG 4538 FAST LINK SETUP (FLSU) | |
|------------------------------------|--|
| FLSU PROTOCOL | Excellent performance in degraded HF channels by means of robust burst waveforms. Automatic channel selection. Synchronous and asynchronous link set up. Point-to-point, multicast and broadcast calls. Combined or separate calling and traffic channels. Combined and simultaneous link set up and traffic set up. Channel quality estimation by means of LQA sounds and LQA exchanges. Handover to circuit data waveform or voice. |
| LINKING PROTECTION | SoDark 3 and 6 Time-of-day distribution by HF means, as a backup to GPS time-of-day distribution. |
| WAVEFORMS | BW1, BW2, BW3, BW4, BW5, BW6 and BW7 according to STANAG 4538. Doppler lock and track (capture range up to +/- 100 Hz, configurable) Adaptive multi-path tracking (up to 10 ms spread, for FLSU & LDL) Linking probability performance 2-3dB better than MIL-STD-188-141C specification |
| OCCUPANCY DETECTION | Occupancy detection (listen before transmit) in accordance with STANAG 4538 MS 110A/B, STANAG 4539 / MS 110B, MS 110A, S4415 S4285, FSK, ALE 2G (8-FSK), SSB voice |

XDL PACKET MODEM – OPTION

| STANAG 4538 XDL PACKET MODEM - OPTION | |
|---------------------------------------|---|
| GENERAL | Integrated with STANAG 4538 FLSU (Required) |
| LDL | Low-Latency Data Link, reliable packet transfer LDL-32, LDL-64, LDL-96, LDL-128, LDL-160, LDL-192, LDL-224, LDL-256, LDL-288, LDL-320, LDL-352, LDL-384, LDL-416, LDL-448, LDL-480, LDL-512. |
| HDL | High-rate Data Link, reliable packet transfer HDL-3, HDL-6, HDL-12, HDL-24. |

| ORDERING INFORMATION | STOCK NUMBER | DESCRIPTION |
|--|-----------------|--|
| TC2 (Hardware only) | TC2-1A-M-M0-6.5 | Module: TC2 Compact 1A M0 (H/W) V6.5 |
| Hardware Activation (Required) | TC2-02-HWAC-KEY | Key: TC2 H/W Activation (required) |
| 3G ALE Fast Link Setup | TC2-SW-O-3G-6.5 | SW MDL-3G ALE 4538 FLSU, Rad. Ctrl V6.5 |
| 3G ALE xDL Packet Data | TC2-SW-O-3D-6.5 | SW MDL-3G ALE 4538 xDL Pcktd Modem V6.5 |
| OTHER SOFTWARE OPTIONS* | STOCK NUMBER | DESCRIPTION |
| HF Modem M1 Software Option | TC2-SW-O-M1-6.5 | SW MDL-M1 (HF 110B, ISB, 110C 6kHz) V6.5 |
| HF Modem M2 Software Option | TC2-SW-O-M2-6.5 | SW MDL-M2 (HF S4285, S4539 9600) V6.5 |
| HF Modem M3 Software Option | TC2-SW-O-M3-6.5 | SW MDL-M3 (HF 110A, 4415 2400) V6.5 |
| HF Modem M4 Software Option | TC2-SW-O-M4-6.5 | SW MDL-M4 (HF MdM S4539 9600 bps) V6.5 |
| 2G ALE | TC2-SW-O-2G-6.5 | SW MDL-2G ALE / MS 141B, App. A, B V6.5 |
| Digital Voice 2400 bps | TC2-SW-O-DH-6.5 | SW MDL-SDVS 2400bps Vocoder, Modem V6.5 |
| Encryption 56-bit | TC2-SW-O-ED-6.5 | SW MDL-COMSEC 56bt HVM/xDL/Voc V6.5 |
| V/UHF Modem L1 (Wideband) | TC2-SW-O-L1-6.5 | SW MDL-L1 (VHF B≤24kHz ≤128kbps) V6.5 |
| V/UHF Modem L4 (Narrowband) | TC2-SW-O-L4-6.5 | SW MDL-L4 (VHF B≤3kHz ≤16kbps) V6.5 |
| EVALUATION KIT* | STOCK NUMBER | DESCRIPTION |
| TC2 Eval. Kit (Carrier Card, Break-out Cable, PSU) | TC2-EV-0011-SPC | Bundle: TC2 Comp Eval Kit ex.TC2 V01 |

* Contact RapidM for Datasheets

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