

HF Modem

2G ALE

3G ALE

V/UHF Modem

56b, 2400 Vocoder



Fig 1.a:
TC2 Top view

Size:
22 x 33 m 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

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

** MELPe for US customers only

TC2 MODULE

Radio Makers are faced with ever-expanding functional and performance demands when developing HF and V/UHF radios. The TC2 is embeddable modem module providing next generation digital capabilities at minimal integration effort and low overall cost.

The TC2 is optimized for an ultra-compact footprint and low power consumption. It is intended for integration into HF and V/UHF radio 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.

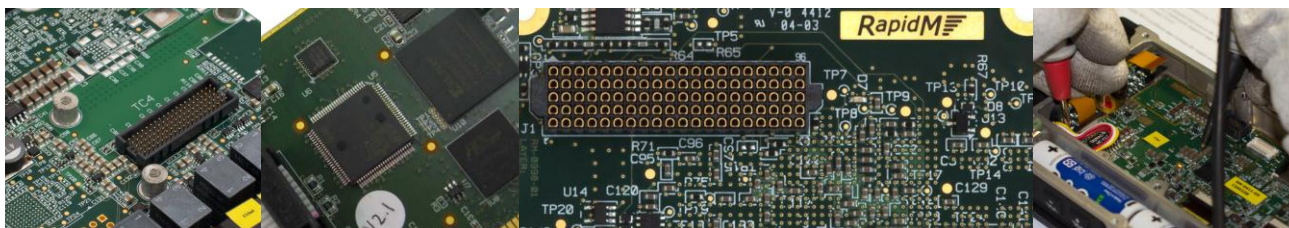
FAST LINK SETUP – STANAG 4538

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 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)	TC2-04-M-M0-V06	Module: TC2 V4 SDM M0 (H/W) V06
Hardware Activation (Required)	TC2-04-HWAC-KEY	Key: TC2 H/W Activation (required)
3G ALE Fast Link Setup	TC2-SW-O-3G-V06	SW MDL-3G ALE 4538 FLSU, Rad. Ctrl V06
3G ALE xDL Packet Data	TC2-SW-O-3D-V06	SW MDL-3G ALE 4538 xDL Pcktd Modem V06
OTHER SOFTWARE OPTIONS*	STOCK NUMBER	DESCRIPTION
HF Modem M1 Software Option	TC2-SW-O-M1-V06	SW MDL-M1 (HF 110B, ISB, 110C 6kHz) V06
HF Modem M2 Software Option	TC2-SW-O-M2-V06	SW MDL-M2 (HF S4285, S4539 9600) V06
HF Modem M3 Software Option	TC2-SW-O-M3-V06	SW MDL-M3 (HF 110A, 4415 2400) V06
HF Modem M4 Software Option	TC2-SW-O-M4-V06	SW MDL-M4 (HF MdM S4539 9600 bps) V06
2G ALE	TC2-SW-O-2G-V06	SW MDL-2G ALE / MS 141B, App. A, B V06
Digital Voice 2400 bps	TC2-SW-O-DH-V06	SW MDL-SDVS 2400bps Vocoder, Modem V06
Encryption 56-bit	TC2-SW-O-ED-V06	SW MDL-COMSEC 56bt HVM/xDL/Voc V06
V/UHF Modem L1 (Wideband)	TC2-SW-O-L1-V06	SW MDL-L1 (VHF B≤24kHz ≤128kbps) V06
V/UHF Modem L4 (Narrowband)	TC2-SW-O-L4-V06	SW MDL-L4 (VHF B≤3kHz ≤16kbps) V06
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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Revision: TC2_ALE3G_EN_02C