DM562AP POS Application Notes

Reference Manual (Preliminary)

Davicom Proprietary Information

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Contents

1. Introduction

1.1 Overview

The DM562AP chip set is a two-chip solution consisting of a DM6588A and a DM6580. The DM6588A modem, packaged in a 128-pin QFP, includes a Microcontroller (80C32), a DSP, and internal RAM. The DM6580 analog front end, packaged in a 48-pin LQFP, it operate over the Public Switched Telephone Network (PSTN), as well as on point-to-point leased lines.

The modem supports multiples DTE interface to host via a logical V.24 (EIA/TIA-232-E) serial DTE interfaces, a parallel 16550 UART-compatible host interfaces and PCI.

1.2 Feature

· Data

V.90/V.34/V.32bis/V.32

V.22bis/V.22/V.23/V.21

Bell 212A/Bell 103

V22 fast connect

V.29 Fast connect (DM562BP Optional)

Legacy Synchronous DCE Mode

· Fax

V.34, V.17, V.29, V.27ter, and V.21 Channel 2

· Voice

Enhanced ADPCM 4/3/2 bits

PCM 8 bits

Dual tone multi-frequency (DTMF) detection

Type I DTMF and FSK Caller ID (CID) Detection

Full-duplex Voice Mode

1.3 Application

· Set top boxes (STB)
· Encrypt /Decrypt modem
· USB modem
· Digital television
· Point-of-Sale terminals (POS)
· MFP (FAX Server)
· Metering terminals
· Video game consoles
· Interactive Voice Recording (IVR)

2. Legacy Synchronous

The DM562AP supports DTE interface to implement an Asynchronous DTE to Synchronous DCE conversion. The DM562AP supports several fast connect modes of operation to reduce the time of a connect sequence in originate mode. A“fast connect” and “transparent HDLC” are also supported. This protocol is also complaint with other modem solutions.

Legacy Synchronous DEC Mode

On the transmit side,

1. If no data is received on TXD, the modem continually transmits HDLC flags at the DCE. As soon as there are 10 characters sent into the transmit buffer, the modem begins an HDLC frame at the DCE.

   The reason for this 10- character “head start” is to reduce the likelihood of an underrun once the HDLC frame has begun at the DCE.
   As long as the host continues to send data, the modem continues to zero insert, update the CRC value, and send data within an HDLC frame.

   To properly end the frame, the host must send a /Zn (see Table 1) indicating to the modem the end of the frame. Once the modem encounters the /Zn, it computes and sends the final CRC and begins transmitting HDLC flags.

   If an HDLC frame is smaller than the 10-character “head start”, the HDLC frame is started at the DCE upon receipt of the /Zn character.

   The /Tn metacharacter is sent to the host to provide an indication that an HDLC frame was sent successfully.

   The “n” in the /Zn and /Tn is a single-byte, host-defined tag that can be used to track multiple HDLC frames.

2. To facilitate transmit flow control, the modem sends the /S and /Q metacharacters to the host.

   If the transmit buffer (512 bytes) is three quarters full, the /S metacharacter is sent to the host. The host must then stop transmitting.

   When the transmit buffer empties down to half full, the /Q metacharacter is sent to the host to

indicate that it is okay to begin transmitting again.

If a transmit underrun occurs, the current frame is aborted, and a /Un is sent to the host. All data from the underrun to the receipt of the /Zn metacharacter is discarded by the modem. A design goal of the host software should be to eliminate any occurrence of the /Un metacharacter.

3. Because the "/" is an escape character, the host must send a "//" when a "/" appears in the transmit data stream.
   The modem removes one "/" for each instance of "//" that appears on TXD.

On the receive side,

1. The modem detects the HDLC flags, and it does not pass the data out RXD.

2. Once the first non-flag word is detected, the modem performs zero deletion, calculates the CRC value, and passes the data out RXD, until detecting the HDLC flags, which indicate the end of the frame.

3. The modem calculates the final CRC and compares it to the CRC value received in the frame.
   If the CRC matches, the modem passes /G to the host.
   If the CRC does not match, the modem passes /B to the host to initiate a retransmit request.

4. Because the / is an escape character, the modem sends a // when a / appears in the receive data stream. The host must remove one / for each instance of // that appears on RXD.

Table 1 Legacy Synchronous DCE Mode Metacharacters

Character*	Direction	Description
/Z*n*	TX	Follows the last character of a transmit frame. Once the frame has been sent, a /T metacharacter is sent to the host. *n* denotes a frame tag. *n* is echoed back later with the /U or /T metacharacters to make frame tracking easier.
//	TX	A forward slash character is to be transmitted.
/E	TX	Escape back to command mode. Si2493/57/34/15/04 returns to command mode.
/U*n*	RX	A transmit underrun has occurred, but a /Z metacharacter was not received. When an underrun occurs, the current frame is aborted; a /U*n* is sent to host, where *n* is the frame tag. All data following the underrun, up to the /Z metacharacter, is discarded by the modem.
/T*n*	RX	The transmit frame, *n*, has been sent. The *n* from the /Z is echoed with the /T*n* to allow tracking frames.
/G	RX	The previous receive frame CRC check was successful.
/B	RX	The previous receive frame CRC check was unsuccessful.
/S	RX	Transmit buffer is almost full; the host must pause transmission to prevent an overflow. If hardware flow control is used, the host may ignore this metacharacter.
/Q	RX	The host may begin transmitting again after a /S (pause) has been sent. If hardware flow control is used, the host may ignore this metacharacter.
//	RX	A forward slash character was received.
/A	RX	Receive frame aborted.
***Note:** Characters after "/" must be uppercase.		

3. Fast Connect

   The modems in this family operate at maximum of V.90 and support all standard ITU-T fall-back modes. These chipsets can be programmed to complywith FCC, JATE, CTR21, and other country-specific PTT requirements. They also support V.42 and MNP2–4 error correction and V.42b and MNP5 compression. A "fast connect" and "transparent HDLC" are also supported.

3.1 V.22 Fast Connect

A common Point-of-Sale V.22 Fast Connect Handshake Protocol (with transparent HDLC) requires these additional settings:

Command	V.22 Fast Connect Protocol
AT$F2	Without transparent HDLC
AT$F2\N0	With transparent HDLC

3.2 V.29 Fast Connect

DM562AP supports a fast connect mode based on the 9600 bps V.29 fax modulation standard.