



Features

- 16 constant-current output channels
- Constant output current invariant to load voltage change:
3~45mA@V_{DD}=5V
3~30mA@V_{DD}=3.3V
- Excellent channel output current accuracy:
 - Between channels: $\pm 1.5\%$(typ.); between ICs: $\pm 3\%$(typ.)
- Power saving mode significantly reduces standby current
- Visual effect control
 - 8-bit dot-correction
 - 7-bit linear programmable output current gain
 - 16-bit or 12-bit grey scale control
 - Random PWM technology to improve refresh rate
- Error detection control
 - In-message error detection: on-the-fly, data-in error-out
 - Compulsory individual LED open/short-circuit detection:
 - full panel, data independent silent error detection in 690ns
 - Configurable short-circuit detection threshold voltage
 - Thermal protection
- EMI reduction
 - Staggered delay of output, preventing from current surge
- Maximum data clock frequency: 30MHz
Maximum grey scale clock frequency: 30MHz
- Auto Power Saving when LEDs are off
- 3V~5.5V Supply Voltage

Application

- Full-color LED display
- VMS system



IT1505

16-Channel LED Driver With 16-Bit PWM Control, Dot-Correction, and Power Saving

General Description

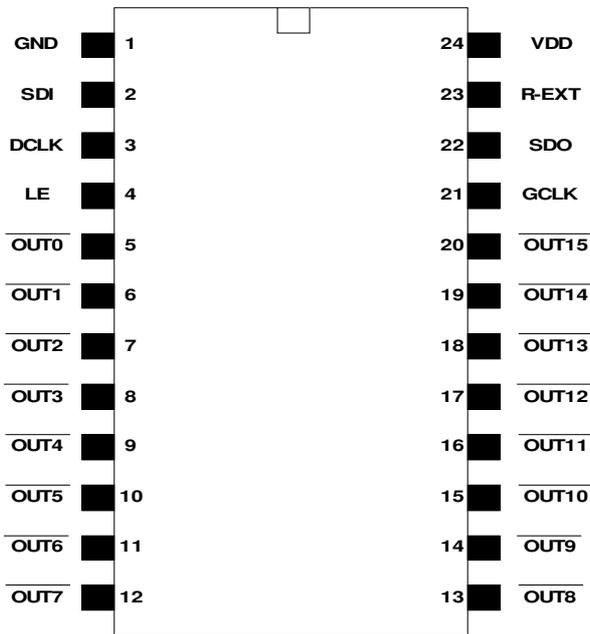
IT1505 is a 16-channel constant current LED driver with selectable 16-/12-bit grey scale control and 8-bit dot correction. The constant current for each output channel is from 3mA to 45mA. The current is set by an external resistor. IT1505 shares the data input and data output to extend the functionality, such as in-message error detection, compulsory error detection, thermal protection, and current gain control in LED display systems.

With random PWM technology, IT1505 improves the PWM by breaking the “on” time into several random period “on” time, therefore IT1505 is able to increase visual refresh quality. Besides, IT1505 provides 16-bit grey scale control to enrich the color of image, allowing to present video images with 65,536 grey scales. IT1505 also provides 8-bit dot correction to calibrate the brightness and color of LEDs individually. Furthermore, the preset current of IT1505 also can be adjusted by 128 steps for LED global brightness.

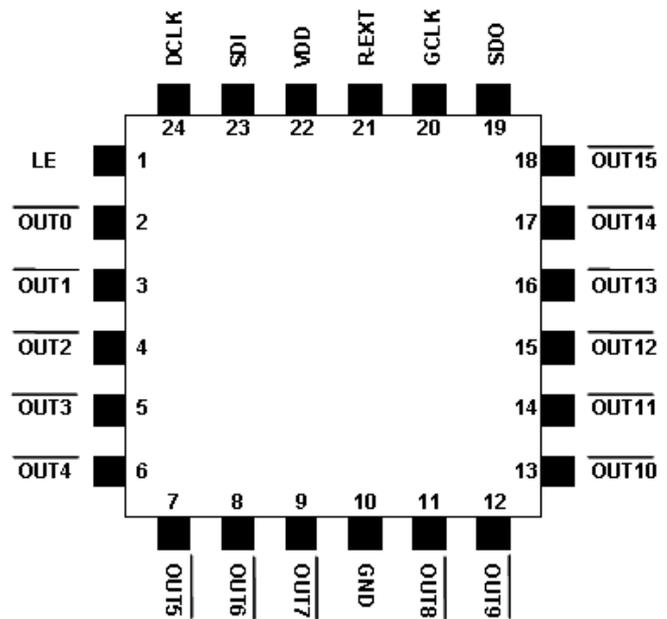
With in-message error detection, IT1505 can detect individual LED for both open- and short-circuit errors on-the-fly without extra components. In addition, to have a better system reliability, IT1505 is built with thermal protection functions.

IT1505 also features one power saving mode. If all 16-output data are “0”, IT1505 will save the power automatically. The power saving mode is suitable for VMS LED display panels when the panels only need to be turned on occasionally.

Pin Configurations



IT1505SP



IT1505QF

Terminal Description

Pin Name	Description
GND	Ground terminal for control logic and current sink.
SDI	Serial-data input to the shift register.
DCLK	Clock input terminal used to shift data on rising edge and carries command information when LE is asserted.
LE	Data strobe terminal and controlling command with DCLK.
OUT0~OUT15	Constant current output terminals.
GCLK	Grey scale clock terminal. Clock input for grey scale. The grey scale display is counted by grey scale clock comparing with input data.
SDO	Serial-data output to the receiver-end SDI of next driver IC.
R-EXT	Input terminal used to connect an external resistor for setting up output current for all output channels.
VDD	3.3V/5V supply voltage terminal.