

Application Information

Enable

The GS7163 has a dedicated enable pin(EN). When the EN pin is in the logic low ($V_{EN} < 0.3V$), the regulator will be turned off, reducing the supply current to less than 1uA.

When the EN pin is in the logic high ($V_{EN} > 1.1V$), the regulator will be turned on and undergoes a new soft-start cycle. Left open, the EN pin is pulled up by an internal resistor to turn on the regulator.

Power-on-Reset

The GS7163 features a power-on-reset control through monitor both input voltages to prevent wrong operations. Only after the two supply voltages exceed their rising POR threshold voltages, the regulator is to be initiated and starts up.

POK

The POK pin is an open-drain output, and can be connects to V_{OUT} or other rail through an external pull-up resistor. As the output voltage arrives 92% of normal output voltage, an internal delay function starts to perform a delay time and then output the POK pin high to indicate the output is OK. As the output voltage falls below the falling Power-OK threshold or one of the two supply voltages falls below it's falling POR threshold, the POK pin will output low immediately without a delay time.

Build-In Soft-Start

An internal soft-start function controls rise rate of the output voltage to limit the current surge at start-up. The typical soft-start interval is about 1mS.

Current Limit

The GS7163 contains over current protection

function. It allows the output current to reach the maximum value of 4.5A. Then further decreases in the load resistance reduce both the load current and the load voltage.

Thermal-Shutdown Protection

Thermal Shutdown protects GS7163 from excessive power dissipation. If the die temperature exceeds 160°C, the pass transistor is shut off. 40°C of hysteresis prevents the regulator from turning on until the die temperature drops to 120°C.

Output Capacitor selection

The GS7163 is designed to employ ceramic output capacitors as low as 10uF; if employ EL output capacitor as large as 1000uF, feedback resistance (R_{bottom}) should be larger than 100K ohm(Table 1). Place the capacitors physically as close as possible to the device with wide and direct PCB traces. Capacitor ESR should be less than 50mohm.

	Cout	Rbottom
Ceramic	$\geq 10\mu F$	$\geq 0.1K \Omega$
EL	1000uF	$\geq 100K \Omega$

Table 1 Cout capacitor vs. Rbottom resistance

Input Capacitor selection

Bypass VIN to ground with a 10uF or greater capacitor. Bypass VCNTL to ground with a 1uF capacitor for normal operation in most applications. Ceramic, tantalum or aluminum electrolytic capacitors may be selected for input capacitor. However ceramic capacitors are recommended due to their significant cost and space savings. Place the capacitors physically as close as possible to the device with wide and direct PCB traces.

Power Dissipation and Layout Considerations

Although internal thermal limiting function is integrated in GS7163, continuously keeping the junction near the thermal shutdown temperature may possibly affect device reliability. For continuous operation, it is highly recommended to keep the junction temperature below the maximum operation junction temperature 125°C for maximum reliability.

The power dissipation definition in device is:

$$P_D = (V_{IN} - V_O) \times I_O + VCNTL \times I_Q$$

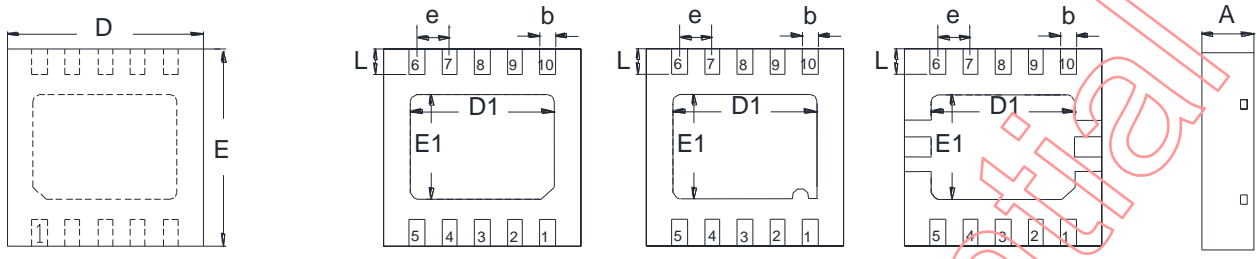
The maximum power dissipation can be calculated as:

$$P_{D(MAX)} = (T_{J(MAX)} - T_A) / \theta_{JA}$$

Where $T_{J(MAX)}$ is the maximum operation junction temperature 125°C, T_A is the ambient temperature and the θ_{JA} is the junction to ambient thermal resistance.

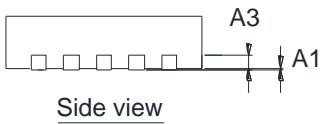
GStek Confidential

Package Dimensions, TDFN10-3x3



Top view

Bottom view



Side view

Pin #1 ID Options

Note: The configuration of the Pin#1 identifier is optional, but must be located within the zone indicated.

Symbol	Dimensions in Millimeters	
	Min.	Max.
A	0.70	0.80
A1	0.00	0.05
A3	0.203 REF.	
b	0.18	0.30
e	0.50 REF.	
D	2.90	3.10
E	2.90	3.10
D1	2.30 REF.	
E1	1.65 REF.	
L	0.30	0.50

Note:

1. Min.: Minimum dimension specified.
2. Max.: Maximum dimension specified.
3. REF.: Reference. Normal/Regular dimension specified for reference.

DISCLAIMERS

Please read the notice stated in this preamble carefully before Admission e accessing any contents of the document attached. Admission of GStek's statement therein is presumed once the document is released to the receiver.

Notice:

Firstly, GREEN SOLUTION CO., LTD. (GStek) reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its information herein without notice. And the aforesaid information does not form any part or parts of any quotation or contract between GStek and the information receiver.

Further, no responsibility is assumed for the usage of the aforesaid information. GStek makes no representation that the interconnect of its circuits as described herein will not infringe on exiting or future patent rights and other intellectual property rights, nor do the descriptions contained herein express or imply that any licenses under any GStek patent right, copyright, mask work right, or other GStek intellectual property right relating to any combination, machine, or process in which GStek products or services are used.

Besides, the product in this document is not designed for use in life support appliances, devices, or systems where malfunction of this product can reasonably be expected to result in personal injury. GStek customers' using or selling this product for use in such applications shall do so at their own risk and agree to fully indemnify GStek for any damage resulting from such improper use or sale.

At last, the information furnished in this document is the property of GStek and shall be treated as highly confidentiality; any kind of distribution, disclosure, copying, transformation or use of whole or parts of this document without duly authorization from GStek by prior written consent is strictly prohibited. The receiver shall fully compensate GStek without any reservation for any losses thereof due to its violation of GStek's confidential request. The receiver is deemed to agree on GStek's confidential request therein suppose that said receiver receives this document without making any expressly opposition. In the condition that aforesaid opposition is made, the receiver shall return this document to GStek immediately without any delay.