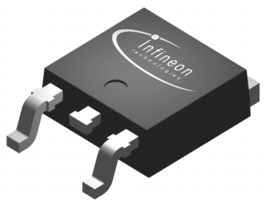
Voltage Regulator **TLE 4284**

Features

- Adjustable output voltage or 1.5V, 1.8V, 2.6V, 3.3 V, 5.0V output voltage
- 1.0 A output current
- Low dropout voltage, typ. 1 V
- Short circuit protection
- Overtemperature protection
- Wide operating range up to 40 V
- Wide temperature range of T_j = -40 to 150 °C
- Suitable for use in automotive electronics
- Green Product (RoHS compliant)
- AEC Qualified



PG-TO-252-3

Functional Description

The TLE 4284 is a monolithic integrated NPN type voltage regulator that can supply loads up to 1.0 A. The chip is housed in a surface mounted PG-TO252-3-11 package (DPAK). It is designed to supply microprocessor systems or other loads under the severe conditions of automotive applications and therefore it is equipped with additional protection against overload, short circuit and overtemperature.

An input voltage V_I in the range of ($V_Q + V_{DR}$) < V_I < 40 V is regulated to V_Q. The dropout voltage V_{DR} ranges from 1.1 V to 1.4 V depending on the load current level.

The device operates in the temperature range of T_j = -40 to 150 °C.

Type	Package	Marking
TLE 4284 DV	PG-TO252-3-11	4284V
TLE 4284 DV15	PG-TO252-3-11	4284V15
TLE 4284 DV18	PG-TO252-3-11	4284V18
TLE 4284 DV26	PG-TO252-3-11	4284V26
TLE 4284 DV33	PG-TO252-3-11	4284V33
TLE 4284 DV50	PG-TO252-3-11	4284V50

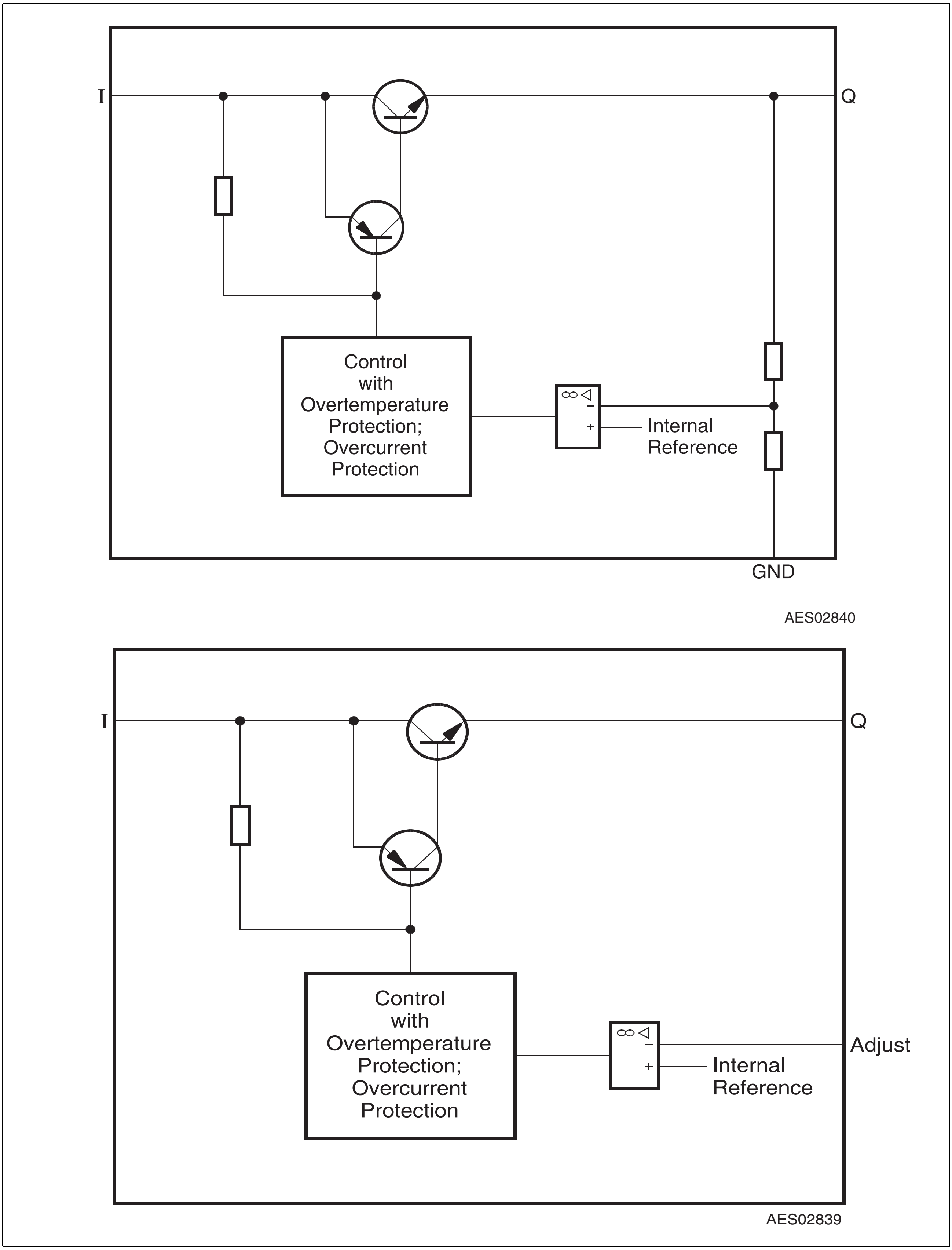


Figure 1 Block Diagram for Fixed and Adjustable Output Voltage TLE 4284

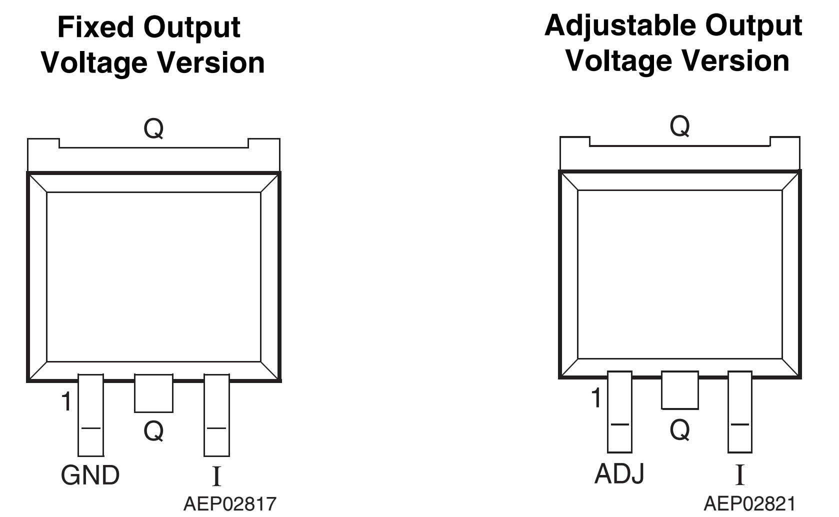


Figure 2 **Pin Configuration** (top view)

Table 1 **Pin Definitions and Functions Fixed Output Voltage Versions**

Pin No.	Symbol	Function
1	GND	**Ground**
2, Tab	Q	**Output;** Connect output pin to GND via a capacitor $C_Q \geq 10\ \mu F$ with ESR $\leq 10\ \Omega$. Connect to heatsink area.
3	I	**Input**

Table 2 **Pin Definitions and Functions Adjustable Output Version**

Pin No.	Symbol	Function
1	ADJ	**Adjust**; defines output voltage by external voltage divider between Q, ADJ and GND.
2, Tab	Q	**Output**; the output voltage is defined by the external voltage divider between Q, Adjust and Ground. Connect the output pin to GND via a capacitor $C_Q \geq 10\ \mu F$ with ESR $\leq 10\ \Omega$. Connect to heatsink area.
3	I	**Input**

Table 3 Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit	Test Condition
		Min.	Max.		
Input - Output Voltage Difference (variable device only)					
Voltage	V_I - V_Q	-0.3	40	V	–
Input Voltage					
Voltage	V_I	-0.3	40	V	–
Output (fixed voltage version only)					
Voltage	V_Q	-0.3	40	V	–
Current	I_Q	–	–	–	Internally limited
Adjust (variable version only)					
Voltage	V_{ADJ}	-0.3	40	V	–
Current	I_{ADJ}	–	–	–	Internally limited
ESD Susceptibility					
Human Body Model (HBM)[1]	Class	–	3	–	–
	Voltage	–	4	kV	–
Charged Device Model (CDM)[2]	Class	–	F5	–	–
	Voltage	–	1	kV	–
Temperature					
Storage temperature	T_{stg}	-50	150	°C	–
Junction temperature	T_j	-40	150	°C	–

1) ESD HBM test according to JEDEC JESD22-A114

2) ESD CDM test according to JEDEC JESD22-C101

Note: Stresses above those listed here may cause permanent damage to the device. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Table 4 Operating Range

Parameter	Symbol	Limit Values		Unit	Remarks
		Min.	Max.		
Input voltage	V_I	V_{Qnom} + V_{DR}	40	V	–
Junction temperature	T_j	-40	150	°C	–
Thermal Resistance					
Junction ambient	R_{thja}	–	144	K/W	PG-TO252-3-11 footprint only[1)]
		–	78	K/W	PG-TO252-3-11 300 mm^2 heat sink area [1)]
		–	54	K/W	PG-TO252-3-11 600 mm^2 heat sink area [1)]
Junction case	R_{thjc}	–	4	K/W	–

1) FR4, 80 x 80 x 1.5mm^2, 35µm Cu, 5µm Sn, horizontal position, zero airflow

Note: Within the operating range, the functions given in the circuit description are fulfilled.

The values listed in the "Electrical Characteristics" tables are ensured over the operating range of the integrated circuit unless otherwise specified. Typical characteristics specify mean values expected over the production spread. If not otherwise specified, typical characteristics apply at T_A = 25 °C and the given supply voltage.

Table 5 Electrical Characteristics TLE 4284 DV (adjustable output voltage)
-40 °C < T_j < 150 °C; V_I - V_Q = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values min.	typ.	max.	Unit	Measuring Conditions
Reference voltage	V_{REF} [1)]	1.20	1.25	1.30	V	–
Line regulation	ΔV_Q	–	0.5	1.50	% [2)]	3 V ≤ (V_I – V_Q) ≤ 40 V
Load regulation	ΔV_Q	–	0.2	0.4	% [2)]	10 mA ≤ I_Q ≤ 800 mA; [4)] V_I = 3.0 V; V_Q = V_{REF}
		–	0.25	0.5	% [2)]	10 mA ≤ I_Q ≤ 1.0 A; [4)] V_I = 3.0 V; V_Q = V_{REF}
Dropout voltage	V_{DR}	–	1.00	1.20	V	I_Q = 100 mA [3)]
		–	1.05	1.30	V	I_Q = 500 mA [3)]
		–	1.10	1.35	V	I_Q = 800 mA [3)]
		–	1.30	1.40	V	I_Q = 1.0 A [3)]
Current consumption $I_q = I_I - I_Q$	I_q	–	100	120	µA	I_Q = 10 mA;
Adjust current	I_{ADJ}	–	75	120	µA	I_Q = 10 mA
Adjust current change	ΔI_{ADJ}	–	2	5	µA	I_Q = 10 mA 3 V ≤ (V_I – V_Q) ≤ 40 V [4)]
		–	2	5	µA	10 mA ≤ I_Q ≤ 200 mA; V_I - V_Q = 3 V [4)]
Temperature stability	–	–	0.6	–	%	[5)]
Minimum load current [6)]	I_Q	–	1	5	mA	V_I < 40 V; V_Q = V_{REF}
Current limit	I_{Qmax}	1000	–	2200	mA	1.4V < V_I - V_Q < 18V; V_Q = V_{nom} -100 mV
		50	200	–	mA	V_I = 40 V; V_Q = V_{nom} -100 mV T_j = 25 °C
RMS Output Noise	–	–	30	–	ppm	ppm of V_Q; T_j = 25 °C; 10 Hz ≤ f ≤ 10kHz [5)]

Table 5 Electrical Characteristics TLE 4284 DV (adjustable output voltage)
-40 °C < T_j < 150 °C; V_I - V_Q = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Sym-bol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Power Supply Ripple Rejection	$PSRR$	–	65	–	dB	V_Q = 10 V, f_r = 120 Hz, V_r = 0.5 V_{PP}, C_{ADJ} = 0 µF [5]
		–	65	–	dB	V_Q = 10 V, f_r = 120 Hz, V_r = 0.5 V_{PP}, C_{ADJ} = 10 µF [5]

1) $V_{REF} = V_Q - V_{ADJ}$
2) Related to V_Q, measured at constant junction Temperature
3) Dropout voltage measured when the output voltage has dropped 100 mV from the nominal value obtained at $V_Q = V_{REF}$.
4) Constant Junction Temperature
5) Not subject to production test - specified by design.
6) Minimum Output Current to maintain regulation

Table 6 Electrical Characteristics TLE 4284 DV15 (1.5 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Output voltage	V_Q	1.45	1.5	1.55	V	10 mA ≤ I_Q ≤ 1000 mA; 2.9 V ≤ V_I ≤ 16 V
		–	1.5	–	V	10 mA ≤ I_Q ≤ 1000 mA; 16 V ≤ V_I ≤ 40 V [1]
Line regulation	ΔV_Q	–	4.8	22.5	mV	2.9 V ≤ V_I ≤ 40 V
Load regulation	ΔV_Q	–	2.6	5.2	mV	10 mA ≤ I_Q ≤ 800 mA; [2] $V_I = V_{Qnom} + V_{DR}$
		–	3.1	6.25	mV	10 mA ≤ I_Q ≤ 1.0 A [2] $V_I = V_{Qnom} + V_{DR}$
Dropout voltage	V_{DR}	–	1.00	1.20	V	I_Q = 100 mA [3]
		–	1.05	1.30	V	I_Q = 500 mA [3]
		–	1.10	1.35	V	I_Q = 800 mA [3]
		–	1.30	1.40	V	I_Q = 1.0 A [3]
Current consumption $I_q = I_I - I_Q$	I_q	–	0.8	1.6	mA	I_Q = 10 mA
Temperature stability	–	–	8.8	–	mV	[4]

Table 6 Electrical Characteristics TLE 4284 DV15 (1.5 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Current limit	I_{Qmax}	1000	–	2200	mA	$V_I - V_Q$ <18V; $V_Q = V_{nom}$ - 100 mV
		50	200	–	mA	V_I = 40 V; $V_Q = V_{nom}$ - 100 mV T_j = 25 °C
RMS Output Noise	–	–	30	–	ppm	ppm of V_Q, T_j = 25 °C 10 Hz ≤ f ≤ 10 kHz 4)
Power Supply Ripple Rejection	$PSRR$	–	65	–	dB	f_r = 120 Hz, V_r=0.5 V_{PP}, C_{ADJ} = 0 µF 4)
		–	65	–	dB	f_r = 120 Hz, V_r =0.5V_{PP}, C_{ADJ} = 10 µF 4)

1) Device is usable within given range without destruction, but the accuracy of the output voltage can only be guarantied in the range specified in the line above.
2) Measured at constant junction temperature
3) Dropout voltage measured when the output voltage has dropped 100 mV from the nominal value.
4) Not subject to production test - specified by design.

Table 7 Electrical Characteristics TLE 4284 DV18 (1.8 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Output voltage	V_Q	1.75	1.8	1.85	V	10 mA ≤ I_Q ≤ 1000 mA; 3.2 V ≤ V_I ≤ 16 V
		–	1.8	–	V	10 mA ≤ I_Q ≤ 1000 mA; 16 V ≤ V_I ≤ 40 V 1)
Line regulation	ΔV_Q	–	7.2	27	mV	3.2 V ≤ V_I ≤ 40 V
Load regulation	ΔV_Q	–	3.4	7.6	mV	10 mA ≤ I_Q ≤ 800 mA 2) V_I=V_{Qnom} + V_{DR}
		–	4.8	9	mV	10 mA ≤ I_Q ≤ 1.0 A 2) V_I=V_{Qnom} + V_{DR}

Table 7 Electrical Characteristics TLE 4284 DV18 (1.8 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Dropout voltage	V_{DR}	–	1.00	1.20	V	I_Q = 100 mA [3)
		–	1.05	1.30	V	I_Q = 500 mA [3)
		–	1.10	1.35	V	I_Q = 800 mA [3)
		–	1.30	1.40	V	I_Q = 1.0 A [3)
Current consumption $I_q = I_I - I_Q$	I_q	–	0.8	1.6	mA	I_Q = 10 mA
Temperature stability	–	–	11	–	mV	[4)
Current limit	I_{Qmax}	1000	–	2200	mA	$V_I - V_Q$ < 18V; $V_Q = V_{nom}$ - 100 mV
		50	200	–	mA	V_I = 40 V; $V_Q = V_{nom}$ - 100 mV T_j = 25 °C
RMS Output Noise	–	–	30	–	ppm	ppm of V_Q, T_j = 25 °C 10 Hz ≤ f ≤ 10 kHz [4)
Power Supply Ripple Rejection	$PSRR$	–	65	–	dB	f_r = 120 Hz; V_r = 0.5 V_{PP} C_{ADJ} = 0 µF [4)
		–	65	–	dB	f_r = 120 Hz; V_r = 0.5 V_{PP}, C_{ADJ} = 10 µF [4)

1) Device is usable within given range without destruction, but the accuracy of the output voltage can only be guarantied in the range specified in the line above.

2) Measured at constant junction temperature

3) Dropout voltage measured when the output voltage has dropped 100 mV from the nominal value.

4) Not subject to production test - specified by design.

Table 8 Electrical Characteristics TLE 4284 DV26 (2.6 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Output voltage	V_Q	2.52	2.60	2.68	V	10 mA ≤ I_Q ≤ 1000 mA; 4.0 V ≤ V_I ≤ 16 V
		–	2.60	–	V	10 mA ≤ I_Q ≤ 1000 mA; 16 V ≤ V_I ≤ 40 V [1)

Table 8 Electrical Characteristics TLE 4284 DV26 (2.6 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Line regulation	ΔV_Q	–	11	40	mV	4.0 V ≤ V_I ≤ 40 V
Load regulation	ΔV_Q	–	5	11	mV	10 mA ≤ I_Q ≤ 800 mA; [2] $V_I = V_{Qnom} + V_{DR}$
		–	7	13	mV	10 mA ≤ I_Q ≤ 1.0 A [2] $V_I = V_{Qnom} + V_{DR}$
Dropout voltage	V_{DR}	–	1.00	1.20	V	I_Q = 100 mA [3]
		–	1.05	1.30	V	I_Q = 500 mA [3]
		–	1.10	1.35	V	I_Q = 800 mA [3]
		–	1.30	1.40	V	I_Q = 1.0 A [3]
Current consumption; $I_q = I_I - I_Q$	I_q	–	0.8	1.6	mA	I_Q = 10 mA
Temperature stability	–	–	16	–	mV	[4]
Current limit	I_{Qmax}	1000	–	2200	mA	$V_I - V_Q$ <18V; $V_Q = V_{nom}$ - 100 mV
		50	200	–	mA	V_I = 40 V; $V_Q = V_{nom}$ - 100 mV T_j = 25 °C
RMS Output Noise	–	–	30	–	ppm	ppm of V_Q, T_j = 25 °C 10 Hz ≤ f ≤ 10 kHz [4]
Power Supply Ripple Rejection	$PSRR$	–	65	–	dB	f_r = 120 Hz, V_r=0.5 V_{PP}, C_{ADJ} = 0 µF [4]
		–	65	–	dB	f_r = 120 Hz, V_r =0.5V_{PP}, C_{ADJ} = 10 µF [4]

1) Device is usable within given range without destruction, but the accuracy of the output voltage can only be guarantied in the range specified in the line above.
2) Measured at constant junction temperature
3) Dropout voltage measured when the output voltage has dropped 100 mV from the nominal value.
4) Not subject to production test - specified by design.

Table 9 Electrical Characteristics TLE 4284 DV33 (3.3 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		Min.	Typ.	Max.		
Output voltage	V_Q	3.20	3.3	3.40	V	10 mA ≤ I_Q ≤ 1000 mA; 4.7 V ≤ V_I ≤ 16 V
		–	3.3	–	V	10 mA ≤ I_Q ≤ 1000 mA ; 16 V ≤ V_I ≤ 40 V [1)]
Line regulation	ΔV_Q	–	15	50	mV	4.7 V ≤ V_I ≤ 40 V
Load regulation	ΔV_Q	–	6	13	mV	10 mA ≤ I_Q ≤ 800 mA [2)] $V_I = V_{Qnom} + V_{DR}$
		–	8	16	mV	10 mA ≤ I_Q ≤ 1.0 A [2)] $V_I = V_{Qnom} + V_{DR}$
Dropout voltage	V_{DR}	–	1.00	1.20	V	I_Q = 100 mA [3)]
		–	1.05	1.30	V	I_Q = 500 mA [3)]
		–	1.10	1.35	V	I_Q = 800 mA [3)]
		–	1.30	1.40	V	I_Q = 1.0 A [3)]
Current consumption $I_q = I_I - I_Q$	I_q	–	0.8	1.6	mA	I_Q = 10 mA
Temperature stability	–	–	20	–	mV	[4)]
Current limit	I_{Qmax}	1000	–	2200	mA	$V_I - V_Q$ < 18V; $V_Q = V_{nom}$ - 100 mV
		50	200	–	mA	V_I = 40 V; $V_Q = V_{nom}$ - 100 mV T_j = 25 °C
RMS Output Noise	–	–	30	–	ppm	ppm of V_Q; T_j = 25 °C; 10 Hz ≤ f ≤ 10 kHz [4)]
Power Supply Ripple Rejection	$PSRR$	–	65	–	dB	f_r = 120 Hz; V_r = 0.5 Vpp; C_{ADJ} = 0 µF [4)]
		–	65	–	dB	f_r = 120 Hz; V_r = 0.5 Vpp; C_{ADJ} = 10 µF [4)]

1) Device is usable within given range without destruction, but the accuracy of the output voltage can only be guarantied in the range specified in the line above.
2) Measured at constant junction temperature.
3) Dropout voltage measured when the output voltage has dropped 100 mV from the nominal value.
4) Not subject to production test - specified by design.

Table 10 Electrical Characteristics TLE 4284 DV50 (5.0 V fixed output voltage)
-40 °C < T_j < 150 °C; V_I = 13.5 V, I_Q = 10 mA; unless otherwise specified

Parameter	Symbol	Limit Values			Unit	Measuring Conditions
		min.	typ.	max.		
Output voltage	V_Q	4.85	5.00	5.15	V	10 mA ≤ I_Q ≤ 1000 mA; 6.4 V ≤ V_I ≤ 16 V
		–	5.00	–	V	10 mA ≤ I_Q ≤ 1000 mA; 16V ≤ V_I ≤ 40 V [1)]
Line regulation	ΔV_Q	–	20	75	mV	6.4 V ≤ V_I ≤ 40 V
Load regulation	ΔV_Q	–	9	20	mV	10 mA ≤ I_Q ≤ 800 mA [2)] $V_I = V_{Qnom} + V_{DR}$
		–	12	24	mV	10 mA ≤ I_Q ≤ 1.0 A [2)] $V_I = V_{Qnom} + V_{DR}$
Dropout voltage	V_{DR}	–	1.00	1.20	V	I_Q = 100 mA [3)]
		–	1.05	1.30	V	I_Q = 500 mA [3)]
		–	1.10	1.35	V	I_Q = 800 mA [3)]
		–	1.30	1.40	V	I_Q = 1.0 A [3)]
Current consumption $I_q = I_I - I_Q$	I_q	–	0.8	1.6	mA	I_Q = 10 mA
Temperature stability	–	–	30	–	mV	[4)]
Current limit	I_{Qmax}	1000	–	2200	mA	$V_I - V_Q$ <18V; $V_Q = V_{nom}$ - 100 mV
		50	200	–	mA	V_I = 40 V; $V_Q = V_{nom}$ - 100 mV T_j = 25 °C
RMS Output Noise	–	–	30	–	ppm	ppm of V_Q, T_j = 25 °C 10 Hz ≤ f ≤ 10 kHz [4)]
Power Supply Ripple Rejection	$PSRR$	–	65	–	dB	f_r = 120 Hz, V_r=0.5 V_{PP}, C_{ADJ} = 0 µF [4)]
		–	65	–	dB	f_r = 120 Hz, V_r=0.5 V_{PP}, C_{ADJ} = 10 µF [4)]

1) Device is usable within given range without destruction, but the accuracy of the output voltage can only be guarantied in the range specified in the line above.
2) Measured at constant junction temperature
3) Dropout voltage measured when the output voltage has dropped 100 mV from the nominal value.
4) Not subject to production test - specified by design.

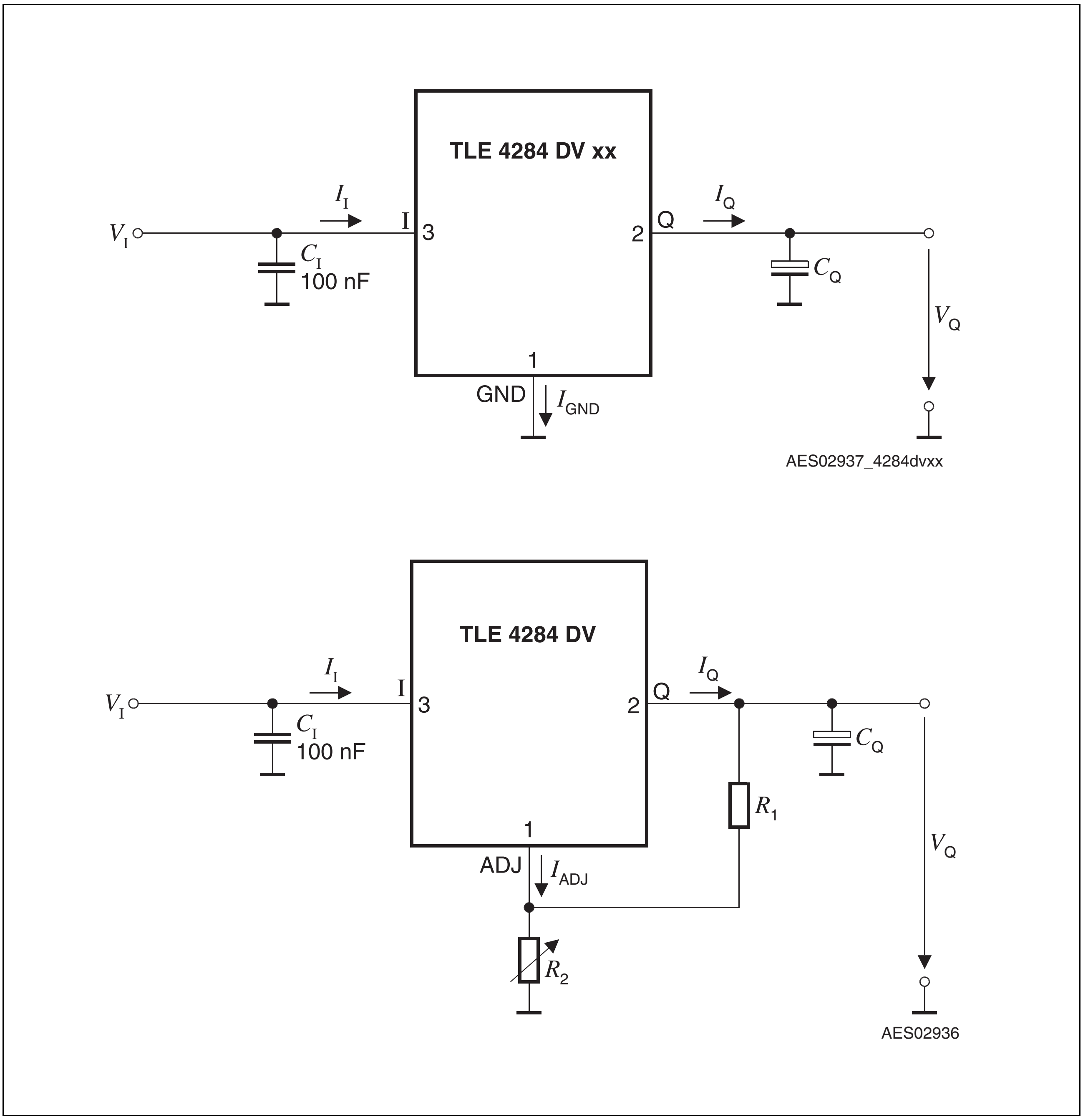


Figure 3 **Measuring Circuit of fixed output voltage versions and adjustable output voltage version**

Application Information

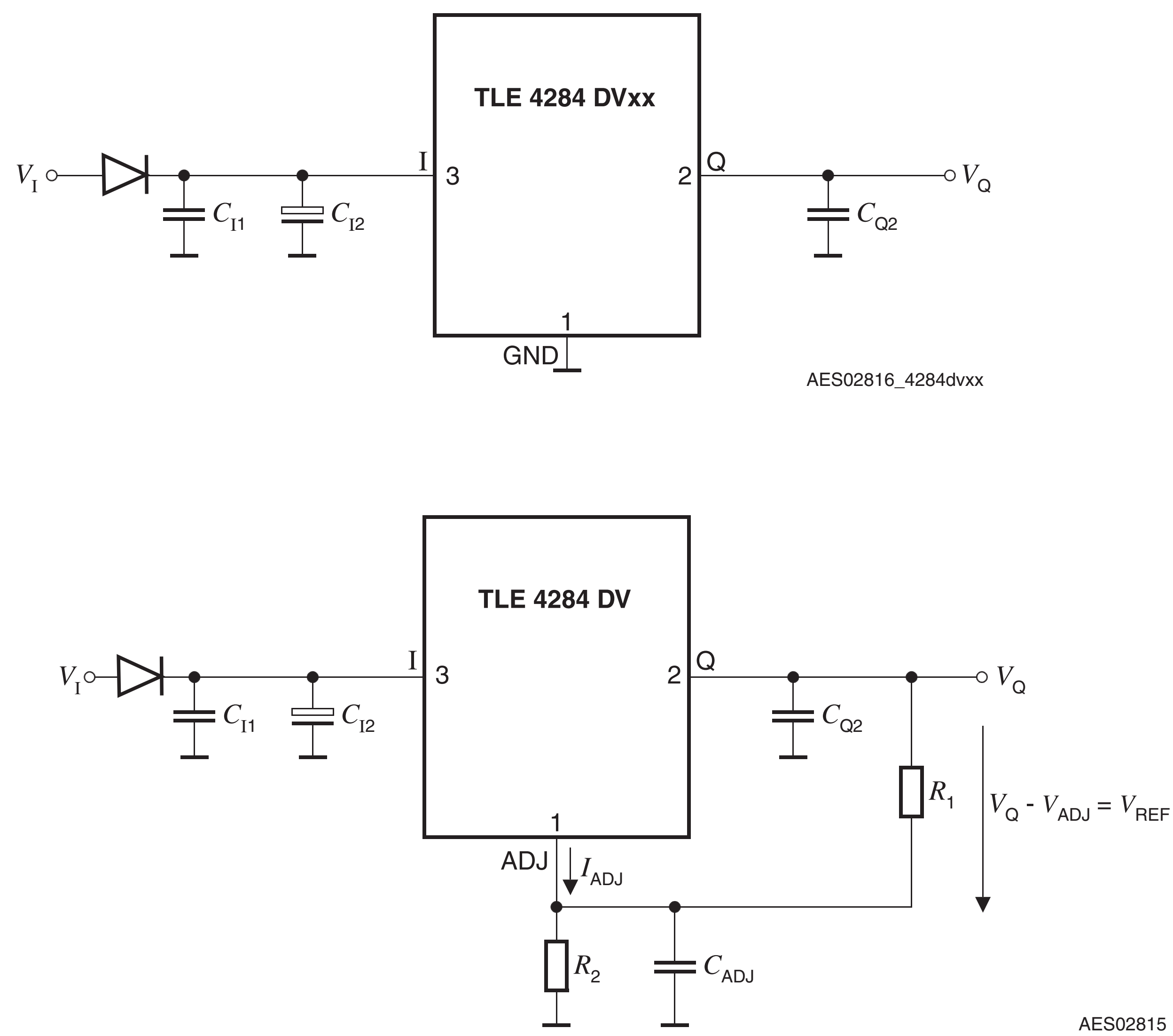
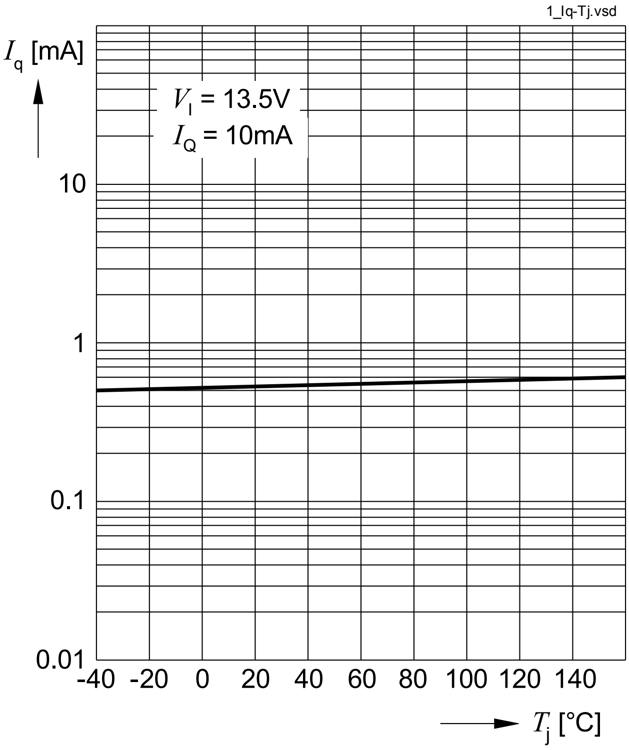


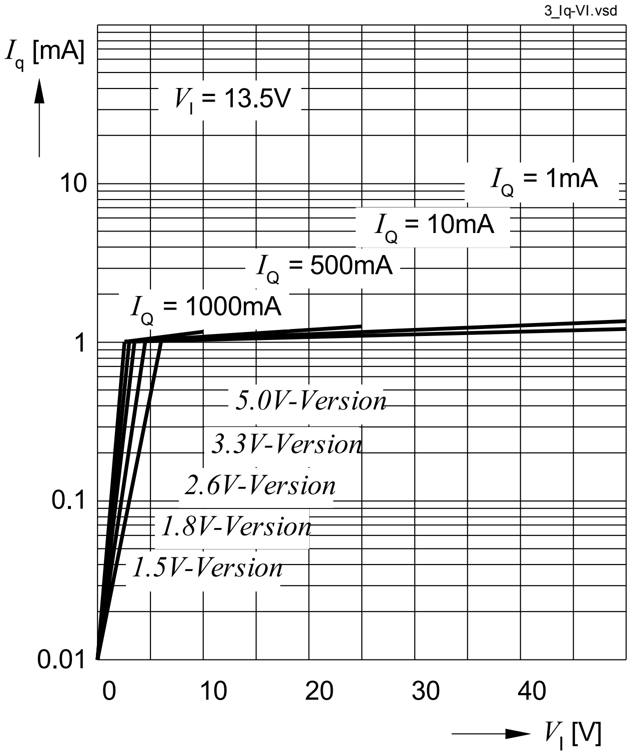
Figure 4 Typical application circuit of fixed output voltage versions and adjustable output voltage version

Typical Performance Characteristics

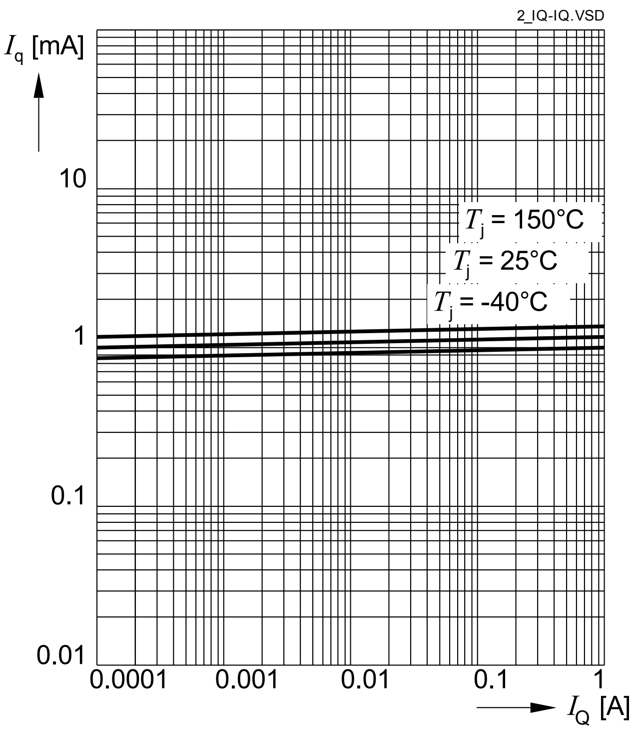
Current Consumption I_q versus Junction Temperature T_j



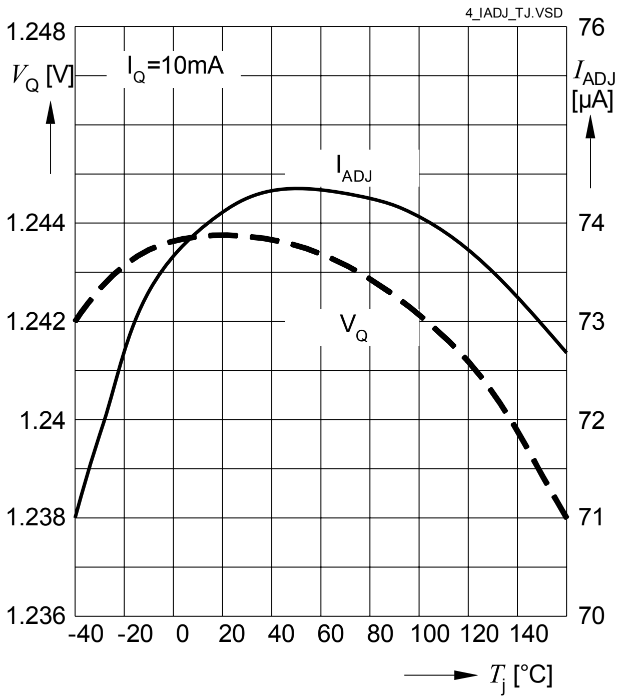
Current Consumption I_q versus Input Voltage V_I



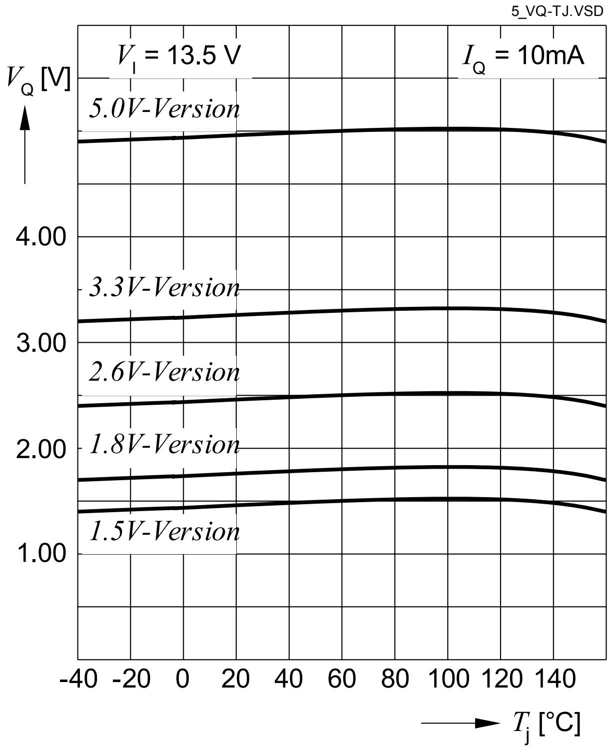
Current Consumption I_q versus Output Current I_Q



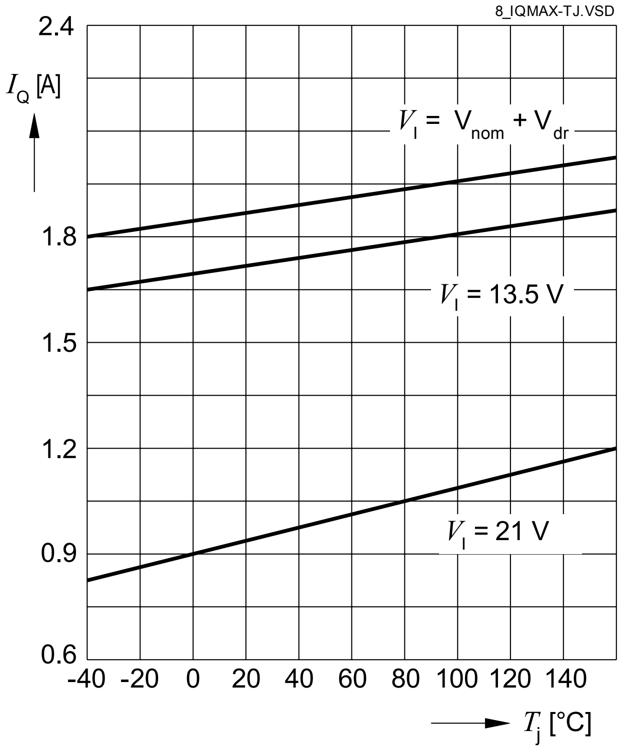
Adjust Current I_{ADJ} and Reference Voltage V_{Ref} vs Junction Temperature T_j



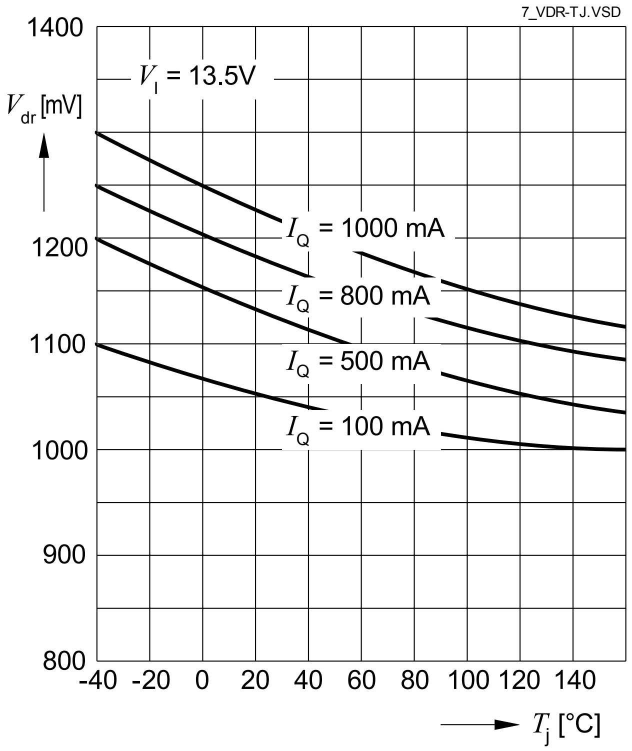
Output Voltage V_Q versus Junction Temperature T_j



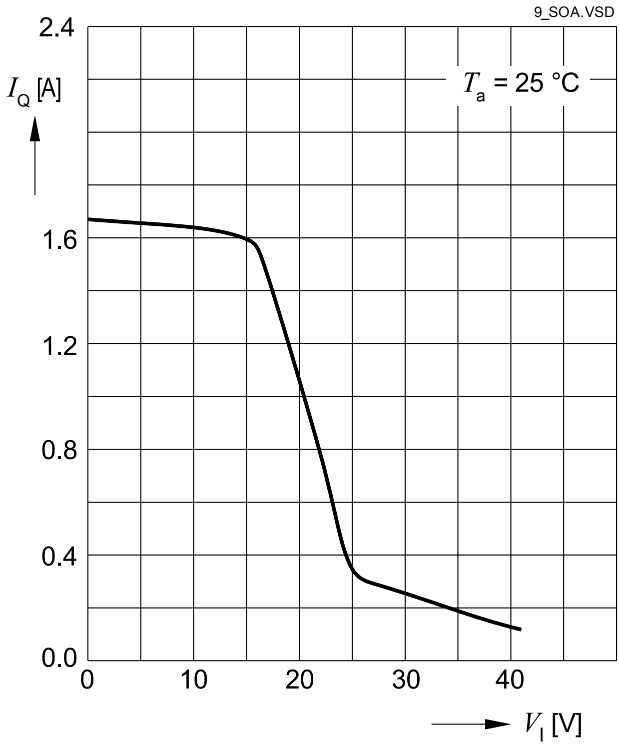
Output Current Limit I_{Qmax} versus Junction Temperature T_j



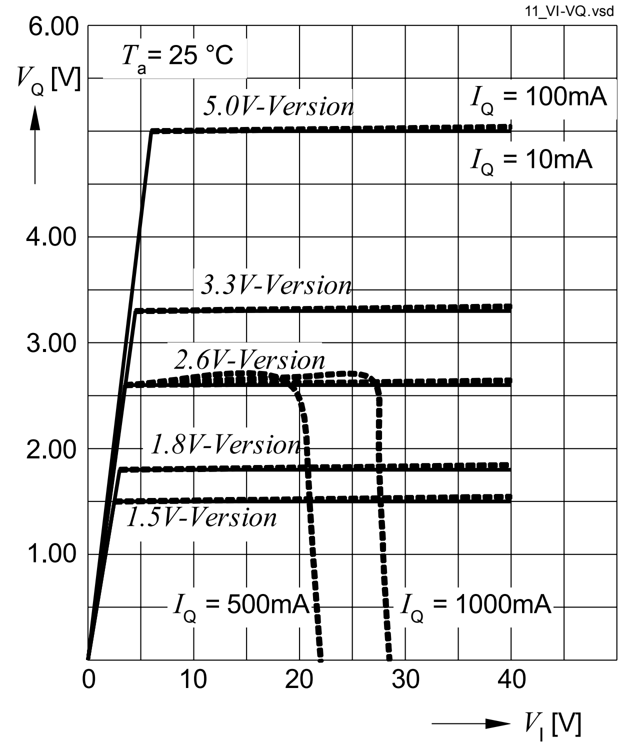
Dropout Voltage V_{DR} versus Junction Temperature T_j



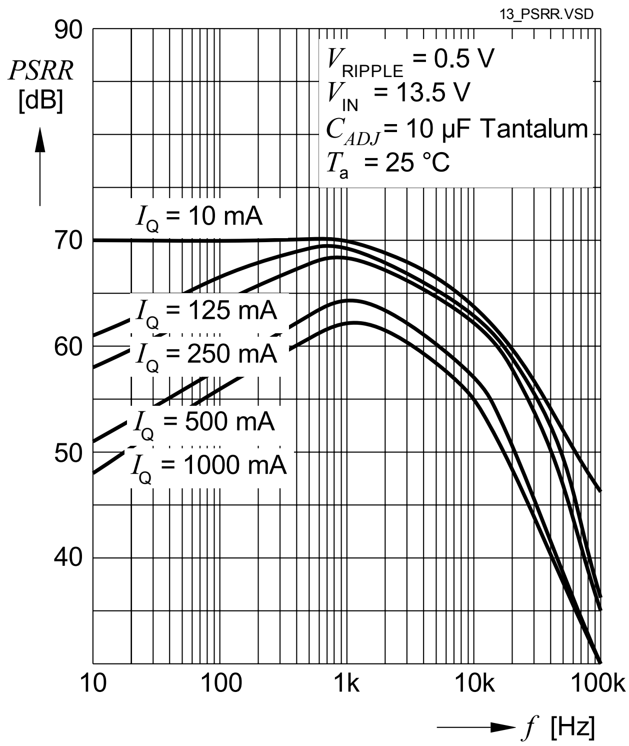
Safe Operation Area (SOA): Output Current I_Q vs. Input Voltage V_I



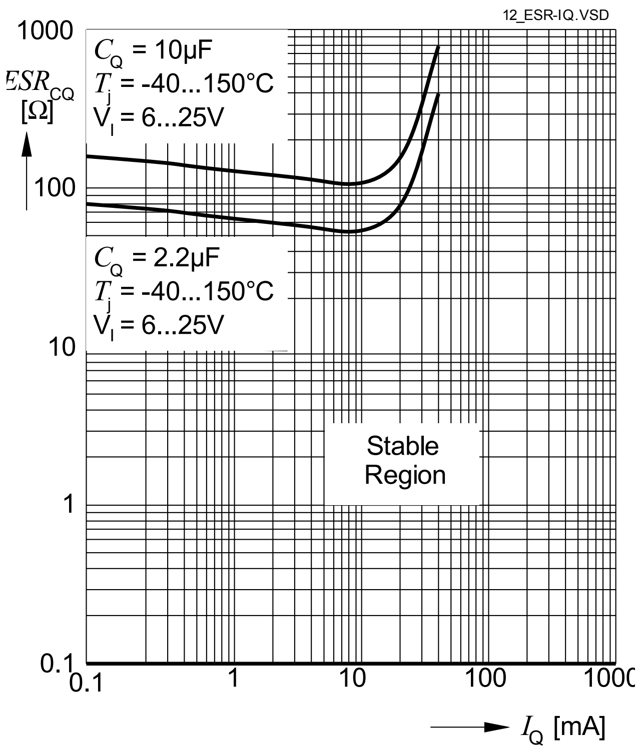
Output Voltage V_Q versus Input Voltage V_I



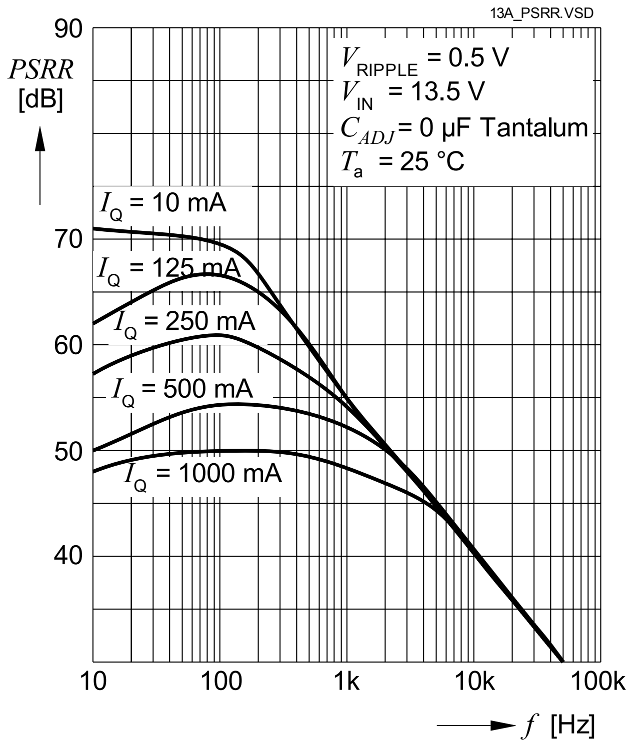
Power Supply Ripple Rejection versus Frequency



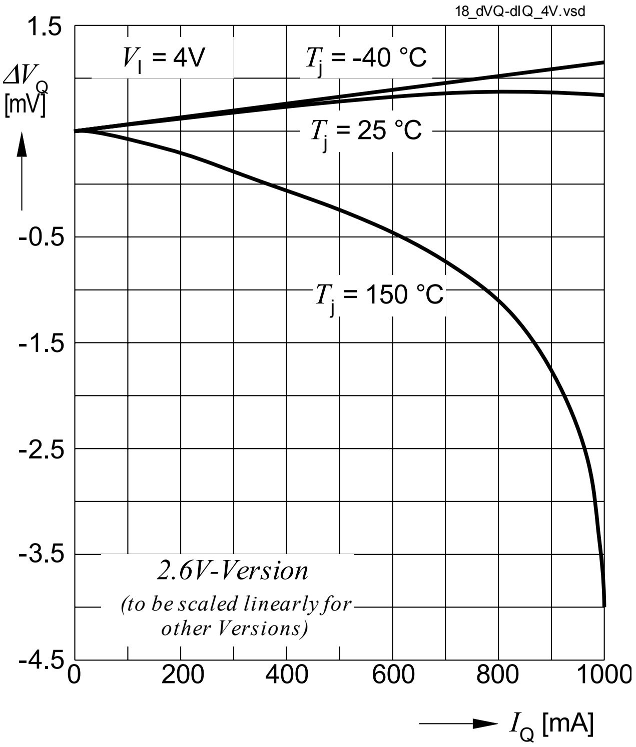
Stability Region: Equivalent Serial Resistor ESR versus Output Current I_Q



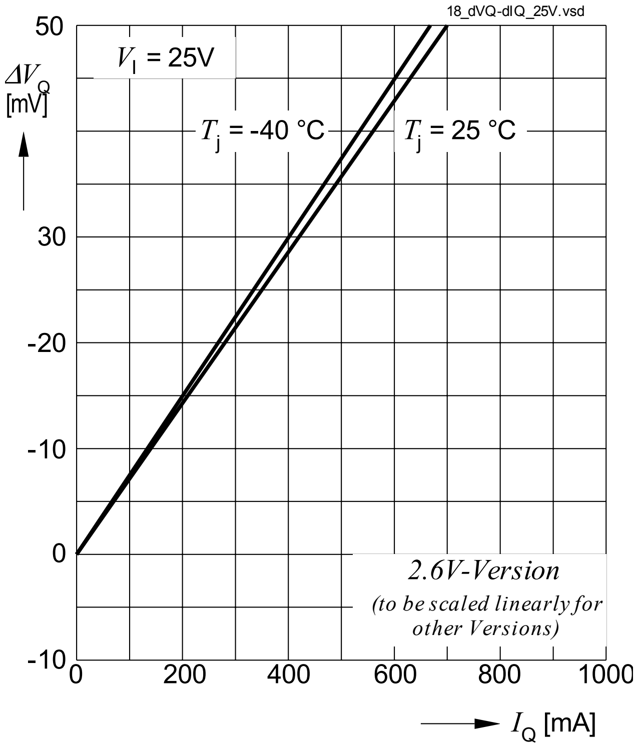
Power Supply Ripple Rejection versus Frequency



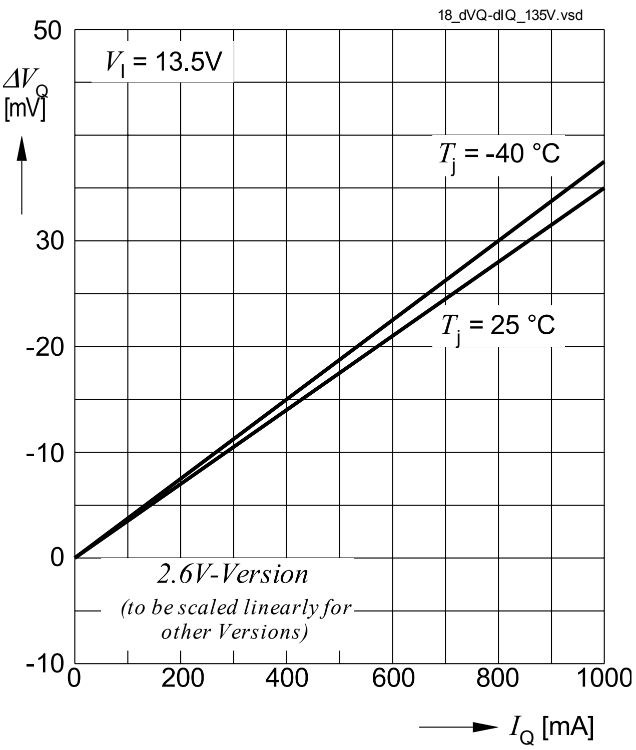
Load Regulation: Delta Output Voltage dV_Q versus delta Output Current dI_Q



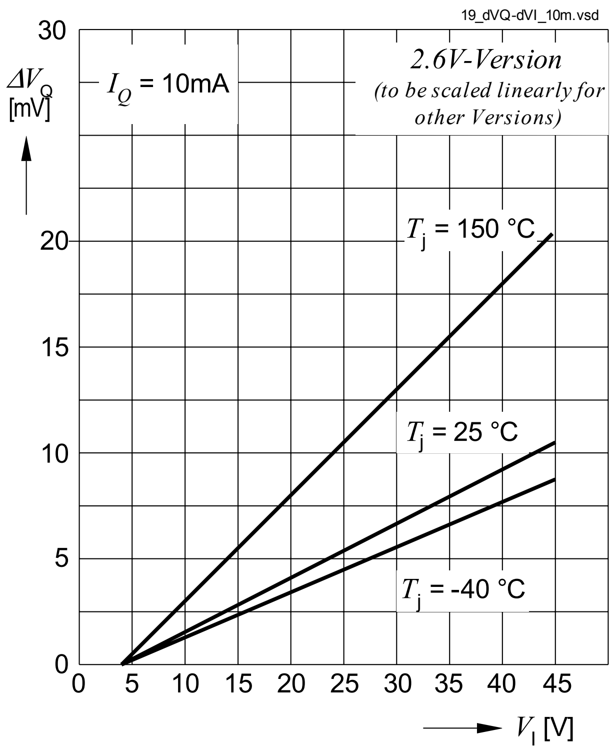
Load Regulation: Delta Output Voltage dV_Q versus delta Output Current dI_Q



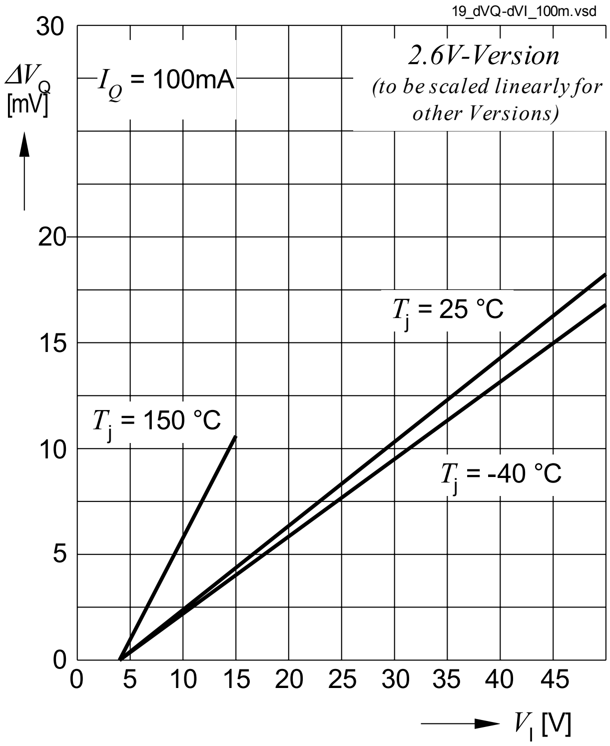
Load Regulation: Delta Output Voltage dV_Q versus delta Output Current dI_Q



Line Regulation: Delta Output Voltage dV_Q versus delta Input Voltage dV_I



Line Regulation: Delta Output Voltage dV_Q versus delta Input Voltage dV_I



Application Hints

Adjustable Version

At the fixed voltage TLE 4284 devices, the output voltage is divided internally and compared to an internal reference of 1.25 V typical. The regulation loop controls the output voltage to achieve the output voltage of 5 V, 3.3 V, 2.6 V, 1.8V or 1.5V. The variable version compares the voltage difference between the adjust pin ADJ and the output pin Q to the internal reference of typically 1.25 V. The output voltage is adjusted by an external voltage divider between Q, ADJ and GND and calculates:

$$V_{Q} = V_{REF} \times \left(1 + \frac{R_2}{R_1}\right) + I_{ADJ} \times R_2$$

For the variable regulator TLE 4284 DV, a minimum load current of 5 mA is necessary in order to keep the output voltage regulated. If the application does not assure this minimum load requirement, the output voltage divider should be dimensioned sufficiently low-ohmic: $R_1 \leq 240\ \Omega$.

For the variable voltage type an additional decoupling a capacitor C_{ADJ} at the adjust pin improves the ripple rejection ratios. Placing C_{ADJ} requires an increased output capacitance of $C_Q \geq 22$ µF.

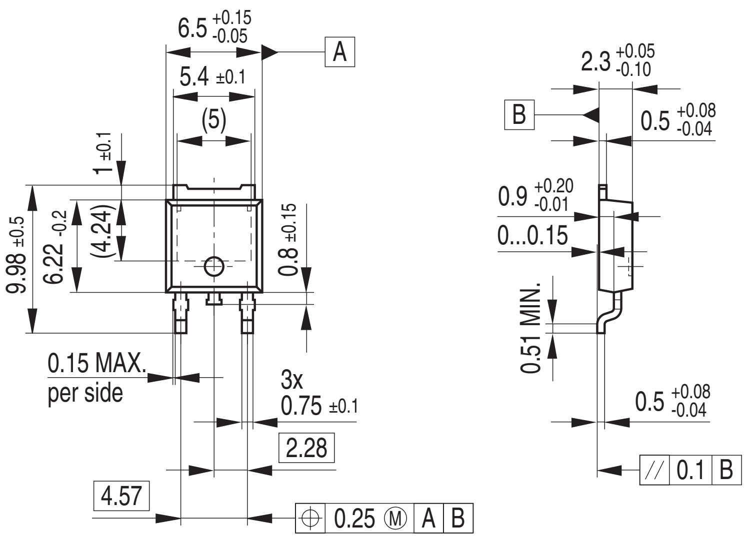
Output

The output current limitation is reduced as a function of the input voltage for high input voltages above 25 V.

The TLE 4284 requires a 10 µF output capacitor with $0.1\ \Omega \leq ESR \leq 10\ \Omega$ for the stability of the regulation loop.

At the input of the regulator a capacitor is necessary for compensation of line influences. A serial diode should be used to eliminate negative voltages from the input. As a minimum, a 100 nF ceramic input capacitor should be used. If the regulator is used in an environment with long input lines, an input capacitance of 10 µF is recommended.

Package Outlines



All metal surfaces tin plated, except area of cut.

Figure 5 Dimensions PG-TO252-3-11

Green Product (RoHS compliant)

To meet the world-wide customer requirements for environmentally friendly products and to be compliant with government regulations the device is available as a green product. Green products are RoHS-Compliant (i.e Pb-free finish on leads and suitable for Pb-free soldering according to IPC/JEDEC J-STD-020).

Find all packages, sorts of packing and others at the Infineon Internet Page:
http://www.infineon.com/packages.

SMD = Surface Mounted Device

Dimensions in mm

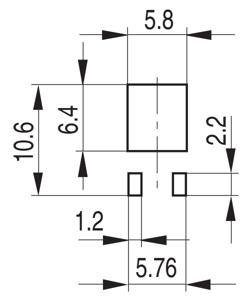


Figure 6 Footprint for PG-TO252-3-11

Find all packages, sorts of packing and others at the Infineon Internet Page:
http://www.infineon.com/packages.

SMD = Surface Mounted Device

Dimensions in mm

Version	Date	Changes
Rev. 2.0	2006-02-13	Page 1: 1.5 V fixed voltage version changed to final status. Page 1: Ordering Codes updated. Table 1, 2: Low ESR requirement for C_Q removed. Table 3: Max. Ratings: ESD Susceptibility Human Body Model improved to 4 kV. Several: Typo and formatting corrections.
Rev. 2.1	2007-03-20	Initial version of RoHS-compliant derivate of TLE 4284 **Page 1**: AEC certified statement added **Page 1** and **Page 22**: RoHS compliance statement and Green product feature added **Page 1** and **Page 22**: Package changed to RoHS compliant version Legal Disclaimer updated

Edition 2007-03-20

Published by
Infineon Technologies AG
81726 Munich, Germany

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