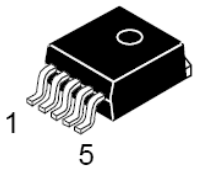
5V/400mA Low Drop Voltage

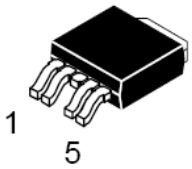
ILE4275

ILE4275 is integrated circuits of voltage regulator 5V/400 mA with low-drop voltage. The IC of voltage regulator 5V/400 mA are purposed to supply DC voltage 5V with 2% accuracy at a range of input voltages from 5,6 to 40 V , with drop voltage 0,5V at load current 300 mA. The IC is used in power supply units of electronic devices, including automotive electronics. Maximum input voltage is 45 V. The IC is tolerant to over voltage of both polarities (positive & negative), provide internal current limitation and output voltage thermal shutdown. Reset function is available.

The IC realized in 5-pin plastic packages TO-263-5 and TO-252-5



ILE4275D2
TO-263-5



ILE4275D0
TO-252-5

ORDERING INFORMATION

Device	Operating Temperature Range	Package	Shipping
ILE4275D2	T_j = -40° to 150° C	TO-263-5	Tube
ILE4275D2T		TO-263-5	Tape & Reel
ILE4275DOT		TO-252-5	Tape & Reel

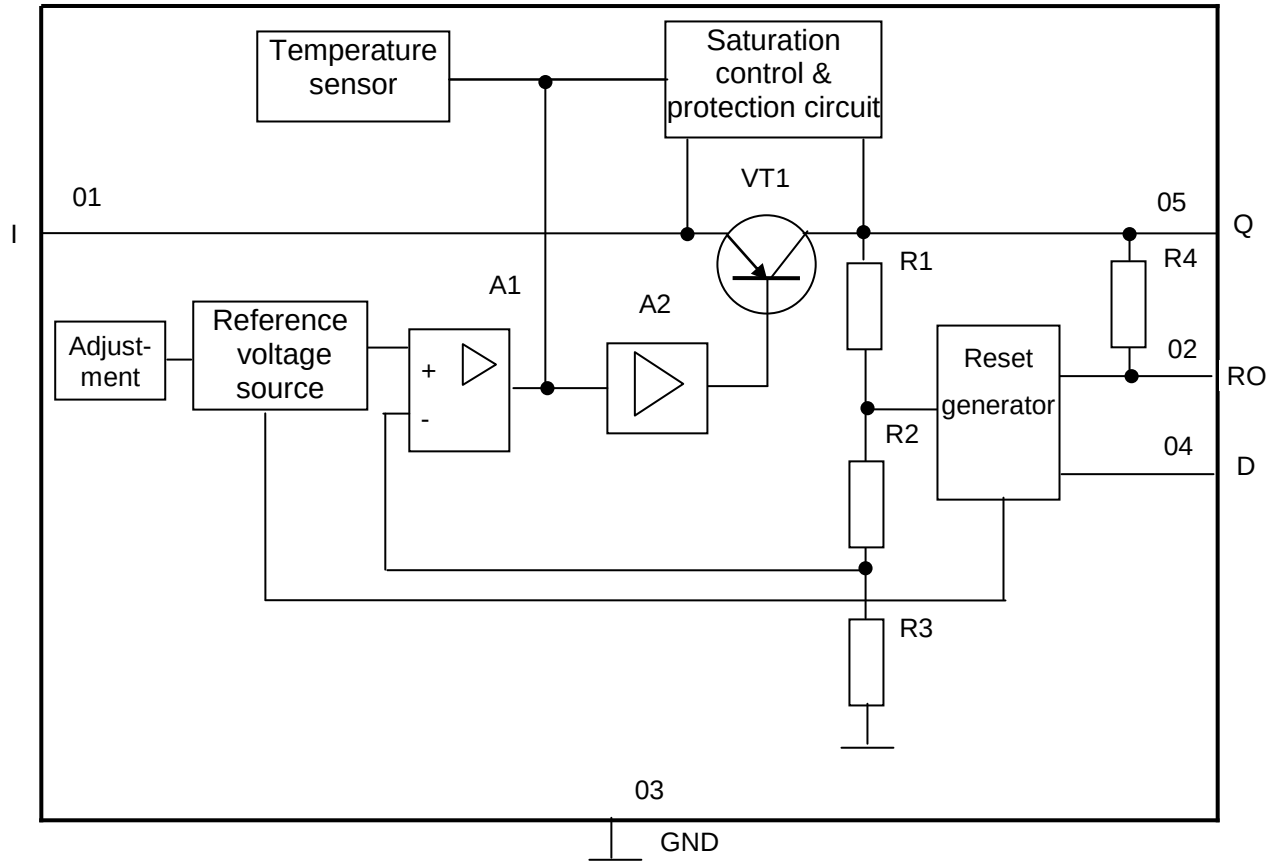
Features

- High accuracy of the output voltage 5 V ± 2%;
- Low-drop voltage ;
- Built-in overheating protection;
- Reverse polarity proof;
- Low consumption current;
- Input voltage up to 45 V;
- Suitable for use in automotive electronics;
- Wide junction temperature range -40 … +150°C;
- Reset function.

Table 1. **Pins Description**

Chip pad number	Package pin number	Symbol	Function
01	01	I	Input
02	02	RO	Reset output
03	03	GND	Common pin (Ground)
04	04	D	Reset delay pin
05, 06	05	Q	Output
07 - 10	-	-	Not bonded (not used)

Block Diagram



A1 – control amplifier;
A2 – buffer;
R1 – R4 –resistors;
VT1 - transistor

Figure 1.

Table 2. **Absolute Maximum Ratings**

Symbol	Parameter	Min.	Max.	Unit
T_J	Junction temperature	-40*	150	^oC
T_{stg}	Storage temperature	-50	150	^oC
V_I	Input voltage	-42	45	V
V_D	Reset delay pin voltage	-0.3**	7**	V
I_D	Reset delay pin current	-2	2	mA
V_R	Reset pin voltage	-0,3**	25**	V
I_{RO}	Reset pin current	-5	5	mA
V_Q	Output voltage	-1,0**	16**	V

* Ambient temperature is indicated.
** Voltage is not applied to input I

* Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied.
Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

Table 3. **Recommended Operation Rate**

Symbol	Parameter	Min.	Max.	Unit
T_J	Junction temperature	-40*	150	^oC
V_I	Input voltage	5,6	40	V
V_Q	Output voltage	4,9	5,1	V

Note:
Maximum power P_{tot},W, dissipated by IC at ambient temperature T_A , is calculated by formula:

$$P_{tot} = (150 - T_A) / R_{th\ j\text{-}a}\ , \qquad (1)$$

150 – maximum permissible operating junction temperature, ^OC.
$R_{th\ j\text{-}a}$ - thermal resistance junction ambient (for IC without heat sink), ^oC /W,
for ILE4275 without heat sink $R_{th\ ja}$ is equal 80 ^oC /W
for ILE4275 without heat sink $R_{th\ ja}$ is equal 65 ^oC /W

for IC with heat sink $R_{th\ ja}$ is calculated by formula

$$R_{th\ j\text{-}a} = R_{th\ j\text{-}c} + R_{th\ c\text{-}a}\ , \qquad (2)$$

$R_{th\ j\text{-}c}$ - thermal resistance junction case, ^oC /W. $R_{th\ jc}$ = 4 ^oC/W.
Thermal resistance case-ambient $R_{th\ c\text{-}a}$ is determined by heat sink design and is selected by IC customer.
Application circuit and heat sink and ambient temperature have to provide junction temperature not more $T_J \leq 150\ ^OC$.

* Ambient temperature is indicated.

Table 4. **Electric Parameters**

(V_I = 13.5 V, V_{ADJ} > 2.0 V, -40°C < T_J < 150°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Max.	Unit
I_q	Consumption current $I_q = I_I - I_Q$	I_Q = -1 mA, T_J = 25 °C	-	0.2	mA
		I_Q = -1 mA, T_J < 85 °C	-	0.22	
		I_Q = -250 mA	-	10	
		I_Q = -400 mA	-	22	
I_{Qmax}	Maximum output current	-	450	-	mA
V_{dr}	Drop voltage	I_Q = -300 mA Note 2	-	0.5	V
V_Q	Output voltage	6 V ≤ V_I ≤ 28 V -5 mA ≤ I_Q ≤ -400 mA	4.9	5.1	V
		6 V ≤ V_I ≤ 40 V -5 mA ≤ I_Q ≤ -200 mA	4.9	5.1	
$\Delta V_{Q(V)}$	Supply (input) voltage regulation of output voltage	8 V ≤ V_I ≤ 32 V I_Q = -5 mA	-15	15	mV
$\Delta V_{Q(I)}$	Load current regulation of output voltage	-5 mA ≤ I_Q ≤ -400 mA	-	30	mV
Reset generator parameters					
V_{RT}	Reset generator switching threshold voltage	-	4.5	4.8	V
I_{ROH}	Reset output leakage current	V_{ROH} = 5 V	-	10	µA
V_{ROL}	Reset output low level voltage	R_{ext} ≥ 5 kΩ, V_Q > 1 V	-	0.4	V
V_{DL}	RO output switching to low threshold voltage	-	0,2	0.7	V
V_{DV}	RO output switching to high threshold voltage	-	1,5	2.2	V
I_d	Charge current	V_D = 1 V	3,0	9.0	µA
t_d	Reset delay time	C_D = 47 nF	10	22	ms
t_{RR}	Reset reaction time	C_D = 47 nF	-	2	µs

Notes

1. Measurement of electric parameters is processed with connected input capacities C_{I1} = 100 µF, C_{I2} = 100 nF and output capacity C_Q = 22 µF.
2. Drop voltage $V_{dr} = V_I - V_Q$ is measured, when the output voltage V_Q has dropped 100mV from the nominal value obtained at V_I = 13.5 V.

* Ambient temperature is indicated.

Table 5. **Typical Electric Parameters**
(V_I = 13.5 V, -40°C < T_J < 150°C unless otherwise specified)

Symbol	Parameter	Test Condition	Typical Value	Unit
PSRR	Ripple rejection ratio	f_r = 100 Hzц, I_Q = -100 mA V_r = 0,5** V (p - p)	60	dB
dV_Q/dT	Temperature factor of output voltage	-	0,5	mV/ °C

* Ambient temperature is indicated.
** It is permitted to measure at $V_{r(p-p)}$ = 3 V, but for that PSRR norm to be revised

Typical Application Diagram

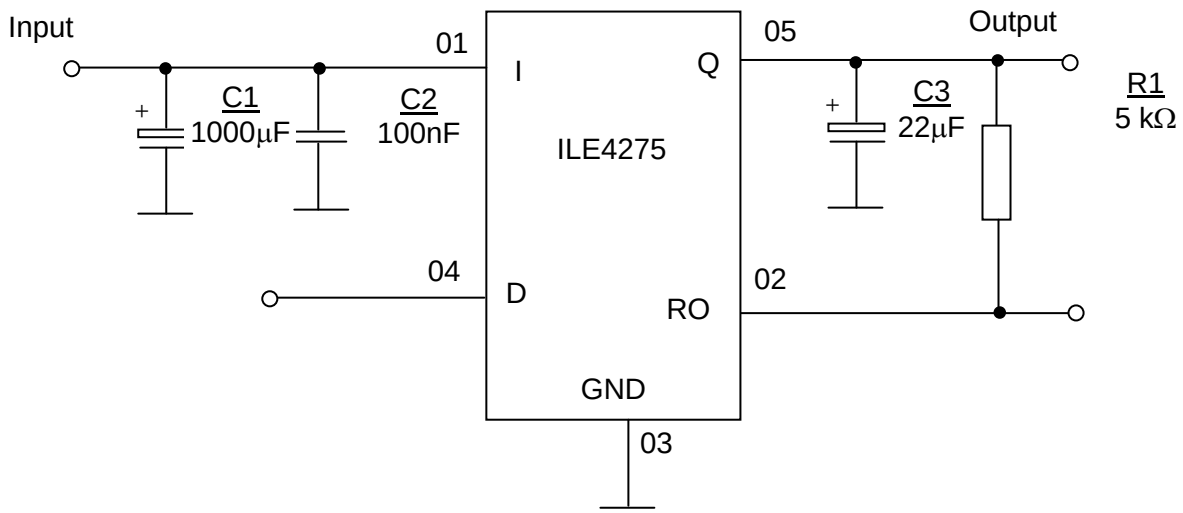


Figure 2.

Operation Timing Diagram

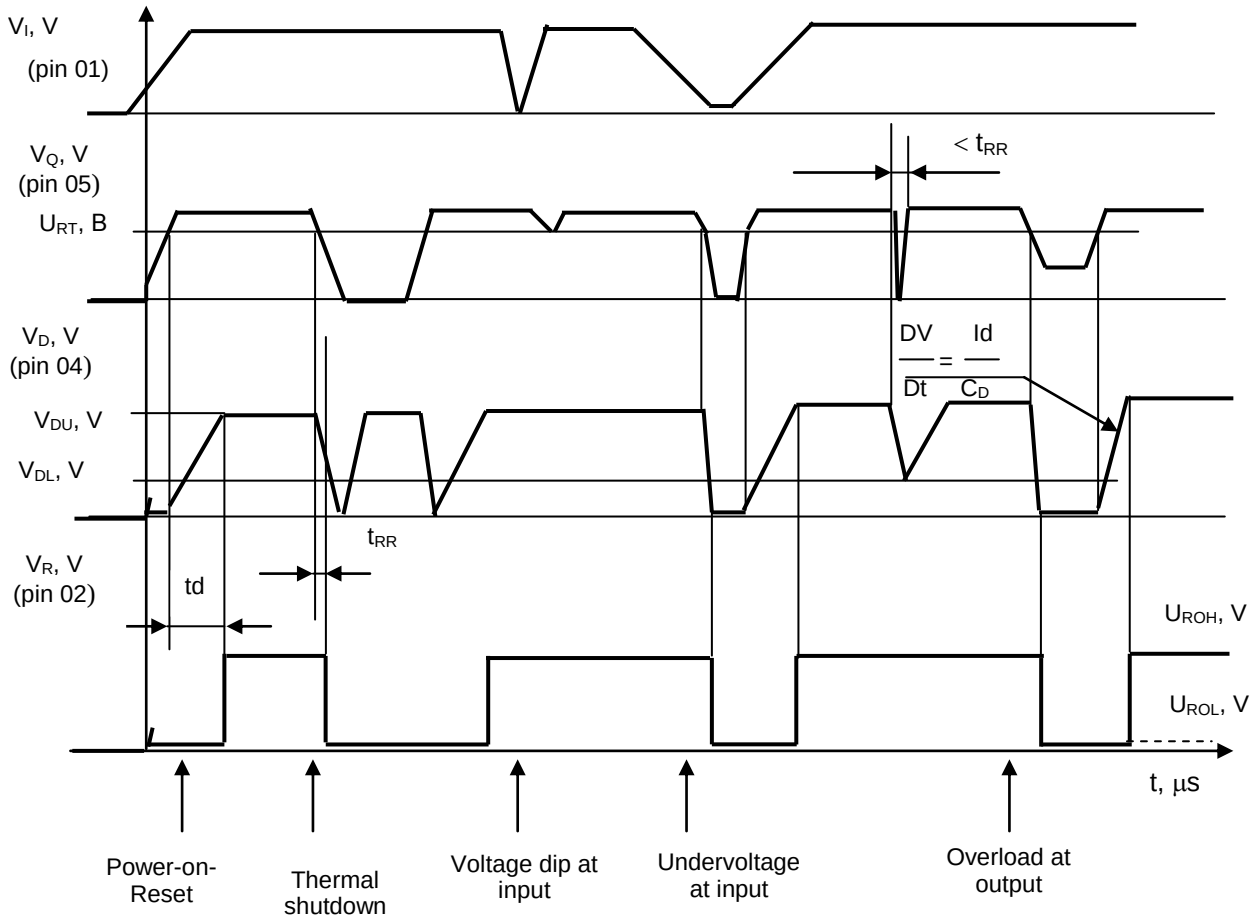
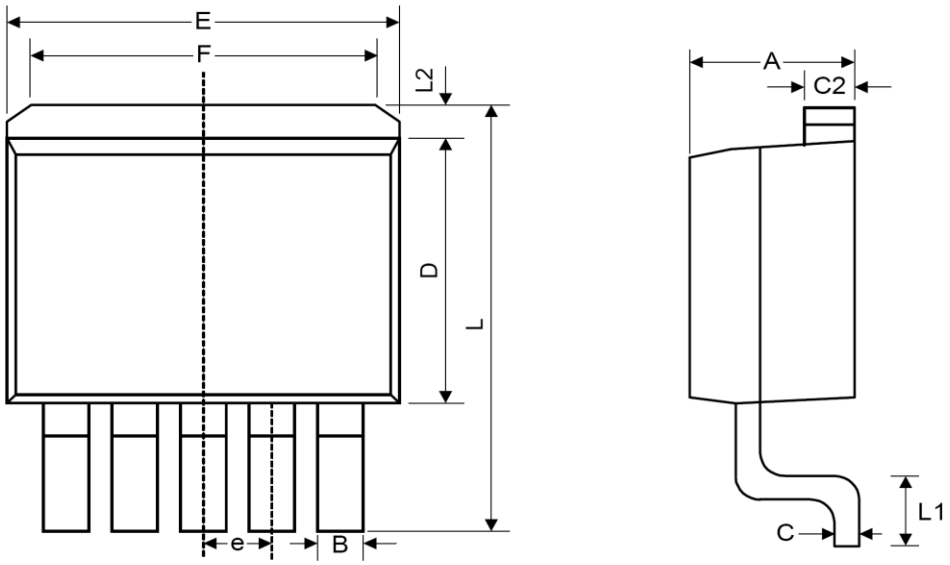
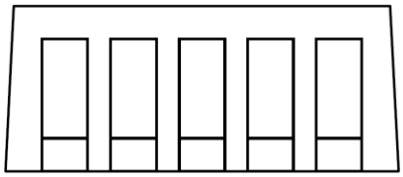


Figure 3.

Package Dimension

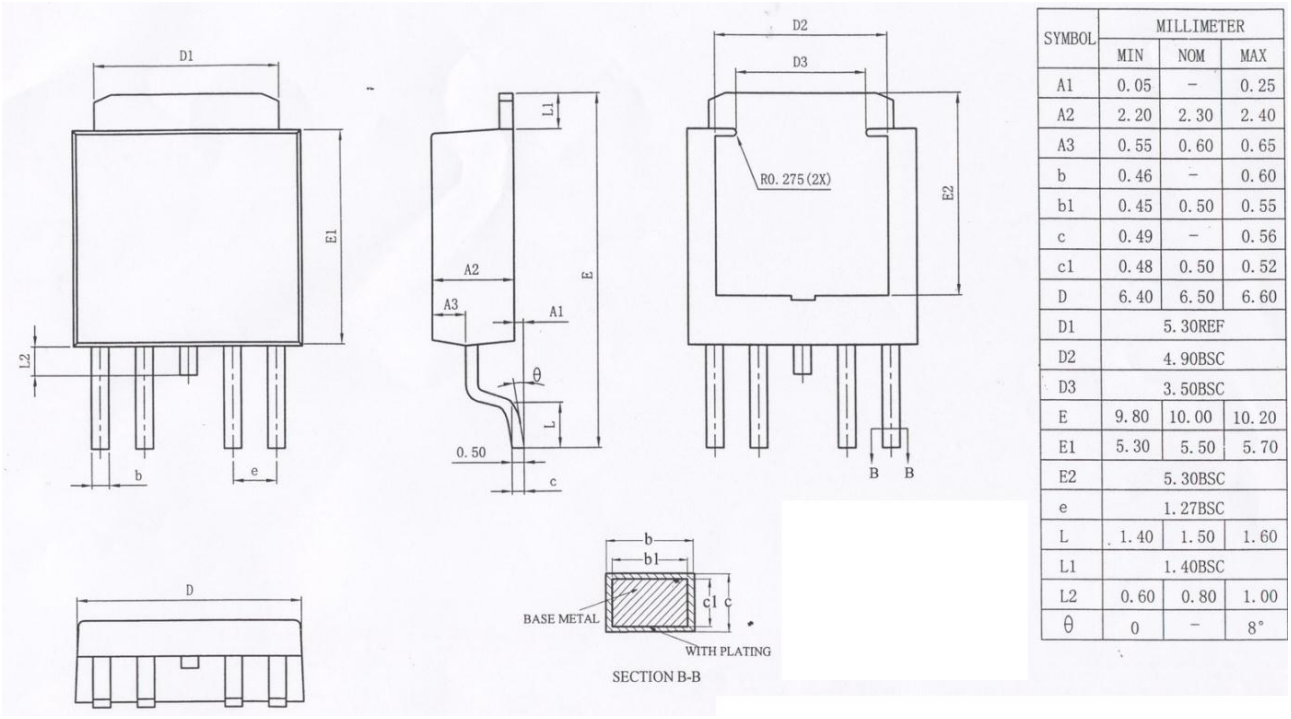
TO-263-5





Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	4.07	4.46	4.85	0.160	0.176	0.191
B	0.66	0.84	1.02	0.026	0.033	0.040
C	0.36	0.50	0.64	0.014	0.020	0.025
C2	1.14	1.27	1.40	0.045	0.050	0.055
D	8.65	9.15	9.65	0.341	0.360	0.380
E	9.78	10.16	10.54	0.385	0.400	0.415
e	1.57	1.71	1.85	0.062	0.068	0.073
F	6.60	6.86	7.11	0.260	0.270	0.280
L	14.61	15.24	15.88	0.575	0.600	0.625
L1	2.29	2.54	2.79	0.090	0.100	0.110
L2	-	-	2.92	-	-	0.115

TO-252-5



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A1	0.05	–	0.25
A2	2.20	2.30	2.40
A3	0.55	0.60	0.65
b	0.46	–	0.60
b1	0.45	0.50	0.55
c	0.49	–	0.56
c1	0.48	0.50	0.52
D	6.40	6.50	6.60
D1	5.30REF		
D2	4.90BSC		
D3	3.50BSC		
E	9.80	10.00	10.20
E1	5.30	5.50	5.70
E2	5.30BSC		
e	1.27BSC		
L	1.40	1.50	1.60
L1	1.40BSC		
L2	0.60	0.80	1.00
θ	0	–	8°