

DART SENSORS

CENELEC Test Data

Dart Sensors (DS) new generation interlock sensor has been expressly developed to meet the exacting CENELEC standard. It uses the 16mm wafer size but incorporates a number of design features not previously adopted.

- ◇ The part will be available with pins or bare wires for soldered applications.
- ◇ The connection pins are intended to be solderless. A matching socket part number is available, or spring clips can be used.

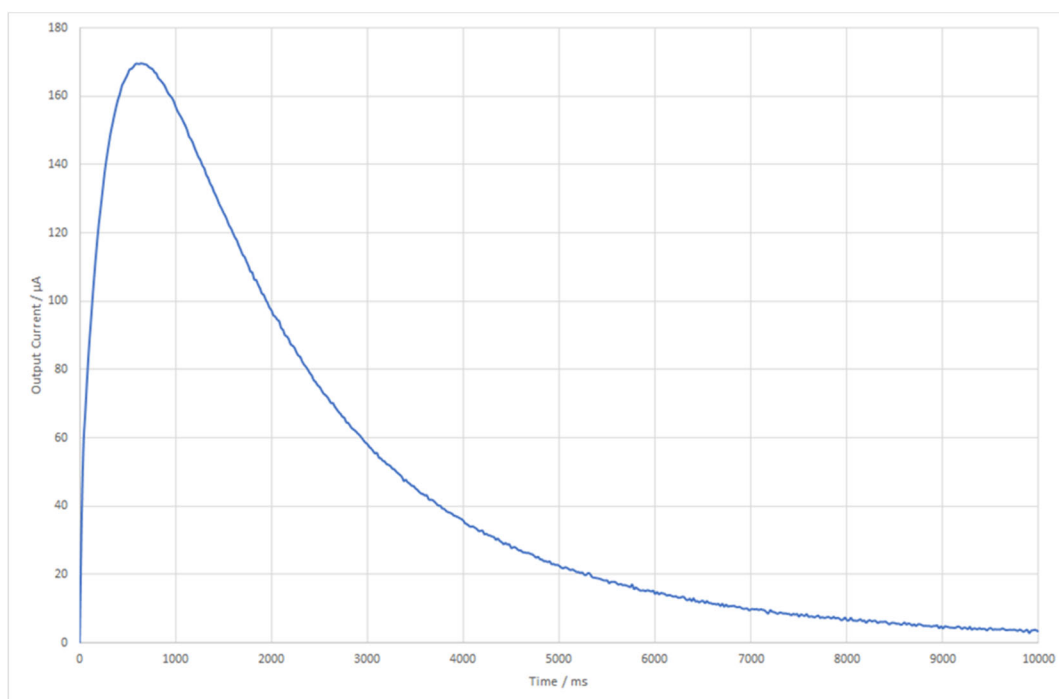
RECOMMENDED OPERATING CONDITIONS

Sample Pump	DS SKU: 3-P035, remains open for 0.3 seconds. 0.35-0.5ml sample volume.
Signal Processing	Curve prediction algorithm recommended or integration, max 95% of peak.
Operation Temperature	Heat the sensor to 30-40°C

ABSOLUTE MAXIMUM RATINGS

Parameter	Value	Units
Temperature Range	-40 to +85	°C
Humidity Range	Up to 95	%RH
Maximum Ethanol Concentration	300	µg/100ml air
Service Life	3-5	years

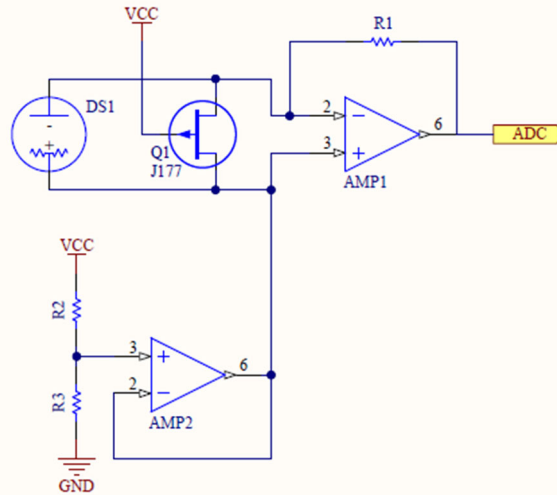
TYPICAL OUTPUT



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APPLICATION CIRCUIT



The reference circuit above is available pre-built from Dart Sensors for development purposes. It incorporates a JFET to short the sensor, preventing offsets from building up when not in use. It also generates a virtual ground, a requirement when operating in single-supply environments.

TEST DATA

Refer to table below.

Thirteen sensors were treated as follows (alcohol concentration 35µg/100 ml).

1. Upper table

Each sensor was tested unconditioned at 35°C, integrating to 5% of peak value. Typical response trace is shown below.

2. Centre table

Each sensor was subjected to one cycle to the CENELEC standard and retested as in table 1.

The data show:

- i. Peak outputs fall but integrals hold up within a range of -1 to +5% of original value.
- ii. Peak and clear times extend: integrals to 5% of peak now range from 9 to 14 seconds. Examination of the response traces showed that integration to 10% of peak would reduce the total time to around 8 seconds, and operation at (say) 40-45°C and application of predictive software would reduce the time still further.
- iii. The data across the batch tend to fall in a tight range.

3. Lower table

In order to gain information on the reserve capacity of the sensors to resist severe repeated cycling through 85°C, each sensor was finally subjected to 31 cycles to the CENELEC standard and retested as in table 1.

0% failure rate under the CENELEC thermal cycling test (ISO 16750-4:2010, 5.3.1.2, with Tmin -40°C and Tmax +85°C).



			CALIBRATION DRIFT								
Sensor	Date & Time	Gain Resistance / Ω	Peak / mV	Peak Current / μ A	Peak Time / ms	Clear _{95%} Time / ms	Integral / mC	Peak Δ / %	Clear Δ / %	Integral Δ / %	
0 CYCLES	Test Sample 1	10/03/2020 12:08	1000	141	141	680	8620	0.4451	0	0	0
	Test Sample 2	10/03/2020 12:16	1000	151	151	680	8400	0.4625	0	0	0
	Test Sample 3	10/03/2020 12:22	1000	165	165	620	7740	0.4613	0	0	0
	Test Sample 4	10/03/2020 12:29	1000	158	158	620	8040	0.4556	0	0	0
	Test Sample 5	10/03/2020 13:30	1000	152	152	660	8200	0.4414	0	0	0
	Test Sample 6	10/03/2020 14:52	1000	150	150	660	8600	0.4489	0	0	0
	Test Sample 7	10/03/2020 13:43	1000	155	155	620	7820	0.4324	0	0	0
	Test Sample 8	10/03/2020 13:47	1000	156	156	620	7840	0.4373	0	0	0
	Test Sample 9	10/03/2020 13:52	1000	170	170	640	7420	0.4561	0	0	0
	Test Sample 10	10/03/2020 13:56	1000	156	156	640	7940	0.4439	0	0	0
	Test Sample 11	10/03/2020 14:00	1000	169	169	640	8240	0.4820	0	0	0
	Test Sample 12	10/03/2020 14:03	1000	157	157	600	8400	0.4666	0	0	0
	Test Sample 13	10/03/2020 14:07	1000	157	157	580	8400	0.4615	0	0	0
1 CYCLE	Test Sample 1	19/03/2020 14:11	1000	122	122	960	10220	0.4442	-13	19	0
	Test Sample 2	19/03/2020 14:44	1000	92	92	1240	14260	0.4702	-39	70	2
	Test Sample 3	19/03/2020 14:48	1000	114	114	960	11640	0.4826	-31	50	5
	Test Sample 4	19/03/2020 14:53	1000	140	140	700	9440	0.4571	-11	17	0
	Test Sample 5	19/03/2020 14:37	1000	129	129	860	10280	0.4645	-15	25	5
	Test Sample 6	19/03/2020 14:57	1000	133	133	760	10540	0.4664	-11	23	4
	Test Sample 7	19/03/2020 15:02	1000	115	115	980	11300	0.4553	-26	45	5
	Test Sample 8	19/03/2020 15:06	1000	126	126	880	10160	0.4514	-19	30	3
	Test Sample 9	19/03/2020 15:09	1000	142	142	780	9780	0.4804	-16	32	5
	Test Sample 10	19/03/2020 15:11	1000	115	115	960	11540	0.4624	-26	45	4
	Test Sample 11	19/03/2020 15:15	1000	116	116	1000	11900	0.4943	-31	44	3
	Test Sample 12	19/03/2020 15:21	1000	112	112	1000	11440	0.4615	-29	36	-1
	Test Sample 13	19/03/2020 15:26	1000	115	115	940	11300	0.4626	-27	35	0
31 CYCLES	Test Sample 1	30/03/2020 12:58	1000	65	65	1160	19480	0.3976	-54	126	-11
	Test Sample 2	30/03/2020 13:09	1000	67	67	1240	19480	0.4007	-56	132	-13
	Test Sample 3	30/03/2020 13:13	1000	73	73	1220	19060	0.4297	-56	146	-7
	Test Sample 4	30/03/2020 13:17	1000	80	80	980	16140	0.3812	-49	101	-16
	Test Sample 5	30/03/2020 13:20	1000	84	84	1040	18000	0.4384	-45	120	-1
	Test Sample 6	30/03/2020 13:26	1000	84	84	900	17180	0.4152	-44	100	-8
	Test Sample 7	30/03/2020 13:32	1000	74	74	1080	17040	0.3890	-52	118	-10
	Test Sample 8	30/03/2020 13:37	1000	80	80	1000	14120	0.3897	-49	80	-11
	Test Sample 9	30/03/2020 13:42	1000	85	85	1000	16880	0.4363	-50	127	-4
	Test Sample 10	30/03/2020 13:47	1000	72	72	1220	18000	0.3991	-54	127	-10
	Test Sample 11	30/03/2020 13:52	1000	75	75	1180	18580	0.4227	-56	125	-12
	Test Sample 12	30/03/2020 13:58	1000	71	71	1200	19620	0.4276	-55	134	-8
	Test Sample 13	30/03/2020 14:03	1000	77	77	1080	16940	0.4193	-51	102	-9