

DIO7527

5.5V Current Limited Load Switch

Features

- Input voltage range: 2.7V to 5.5V
- 70m Ω typical $R_{DS(ON)}$
- 70 μ A quiescent current
- Under-Voltage Lockout
- High precision over current trigger point
- Open-drain Fault Flag Pin
- Output Reverse-Voltage Protection
- 6kV output pin ESD
- Available in Package of SOT23-5, SOT23-6, MSOP-8, EP-MSOP-8

Application

- Hot Swap Supplies
- Notebook Computers
- Peripheral Ports
- Personal Communication Devices

Descriptions

The DIO7527 is a current limited P-channel MOSFET power switch, which designed for high side load switch applications.

An open-drain flag output is also available to indicate fault condition, including over current, thermal shutdown, input UVLO and output reverse-voltage condition.

The load-switch product family from DIOO including almost all industry standard. Please contact our sales if you are interested.

Block Diagram

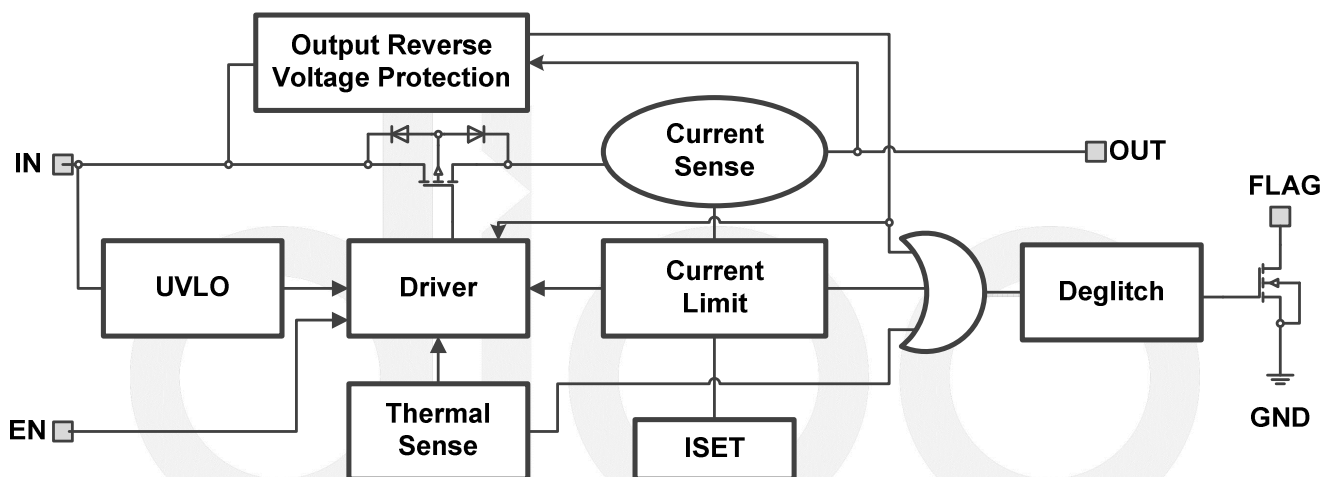


Figure 1 Functional Block Diagram

Ordering Information

Order Part Number	Top Marking	Enable	Output Shutdown Resistor	T _A	Package	
DIO7527AST5	YW7A	Active High	Yes	-40 to +85°C	SOT23-5	Tape & Reel, 3000
DIO7527BST5	YW7B	Active Low	Yes	-40 to +85°C	SOT23-5	Tape & Reel, 3000
DIO7527CST5	YW7C	Active High	No	-40 to +85°C	SOT23-5	Tape & Reel, 3000
DIO7527DST5	YW7D	Active Low	No	-40 to +85°C	SOT23-5	Tape & Reel, 3000
DIO7527AST6	YW7A	Active High	Yes	-40 to +85°C	SOT23-6	Tape & Reel, 3000
DIO7527BST6	YW7B	Active Low	Yes	-40 to +85°C	SOT23-6	Tape & Reel, 3000
DIO7527CST6	YW7C	Active High	No	-40 to +85°C	SOT23-6	Tape & Reel, 3000
DIO7527DST6	YW7D	Active Low	No	-40 to +85°C	SOT23-6	Tape & Reel, 3000
DIO7527AMP8	D27A	Active High	Yes	-40 to +85°C	MSOP-8	Tape & Reel, 3000
DIO7527BMP8	D27B	Active Low	Yes	-40 to +85°C	MSOP-8	Tape & Reel, 3000
DIO7527CMP8	D27C	Active High	No	-40 to +85°C	MSOP-8	Tape & Reel, 3000
DIO7527DMP8	D27D	Active Low	No	-40 to +85°C	MSOP-8	Tape & Reel, 3000
DIO7527AXM8	D27A	Active High	Yes	-40 to +85°C	EP-MSOP-8	Tape & Reel, 3000
DIO7527BXM8	D27B	Active Low	Yes	-40 to +85°C	EP-MSOP-8	Tape & Reel, 3000
DIO7527CXM8	D27C	Active High	No	-40 to +85°C	EP-MSOP-8	Tape & Reel, 3000
DIO7527DXM8	D27D	Active Low	No	-40 to +85°C	EP-MSOP-8	Tape & Reel, 3000

Pin Assignment

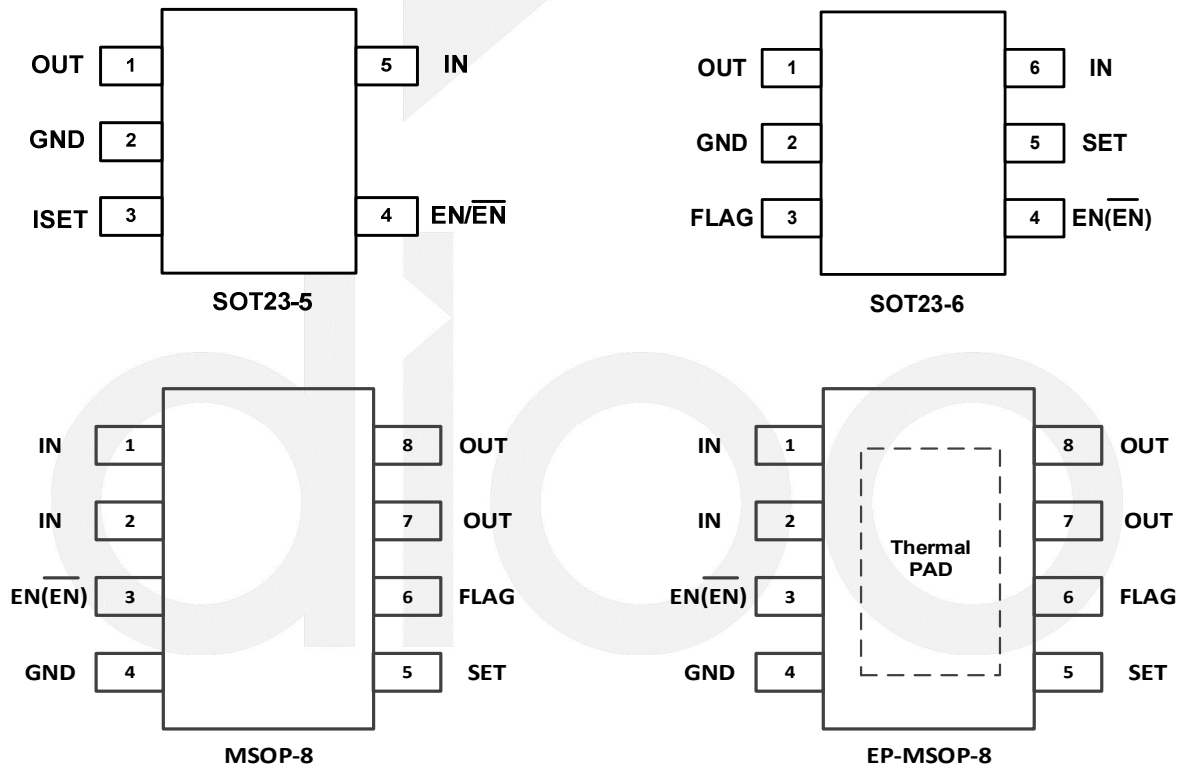


Figure 1 Pin Assignment

Pin Description

Name	Function
OUT	Output pin, decoupled with a capacitor to GND
GND	Ground pin
SET	Current limit programming pin. Connect a resistor R_{SET} from this pin to ground to program the current limit.
EN($\overline{EN}$)	ON/OFF control. Pull high to enable IC. Do not leave it floating
FLAG	Open-drain Fault Flag Pin.
IN	Input pin, decoupled with a capacitor to GND.

Absolute Maximum Ratings

Stresses beyond those listed under "Absolute Maximum Rating" may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

Parameter		Rating	Unit
Terminal Voltage(With respect to GND)	V _{IN}	-0.3 to 6.0	V
	Other Inputs	-0.3 to 6.0	
Fault Flag Voltage	V _{FLG}	-0.3 to 6.0	V
Fault Flag Current	I _{FLG}	50	mA
Package Thermal Resistance	SOT23-6	190	°C/W
	EP-MSOP-8	100	°C/W
Maximum Junction Temperature		150	°C
Operating Temperature/T _A		-40 to 85	°C
Storage Temperature/T _{STO}		-65 to 150	°C
Lead Temperature Rating		300	°C
ESD Susceptibility	HBM (Human Body Mode)	6	KV
	MM (Machine Mode)	200	V

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended Operating conditions are specified to ensure optimal performance to the datasheet specifications. DIOO does not Recommend exceeding them or designing to Absolute Maximum Ratings.

Parameter	Rating	Unit
IN	2.7-5.5	V
All other pins	0-5.5	V
Junction Temperature Range	-40 to 125	°C
Ambient Temperature Range	-40 to 85	°C



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Electrical Characteristics

Typical value: $T_A = 25^{\circ}\text{C}$, $V_{IN}=5\text{V}$, unless otherwise specified.

Symbol	Parameters	Conditions	Min	Typ.	Max	Unit
V_{IN}	Operation Voltage		2.7		5.5	V
$R_{DS(ON)}$	On Resistance	$V_{IN}=5\text{V}$		70		m Ω
I_{OS}	Over Current Limit	$R_{SET}= 39\text{k}\Omega$	0.9	1	1.1	A
I_Q	Quiescent Supply Current	Open load, IC Enabled.		70		μA
T_r	Turn On Time	$R_L=10\Omega$, 90% Setting		0.4		ms
$V_{EN(H)}$	EN Input Threshold-High V_{IH}		1.4			V
$V_{EN(L)}$	EN Input Threshold-Low V_{IL}				0.4	V
	FLAG Deglitch Time	FLAG assertion or desertion	4	8	15	ms
	Output Reverse Voltage Deglitch Time		2.5	4	7	ms
I_{SHDN}	Shutdown Input Current	Open load, IC Disabled.			1	μA
	Shutdown Pull low Resistance			330		Ω
T_{SD}	Thermal Shutdown			140		$^{\circ}\text{C}$
	Thermal Limit Hysteresis			20		$^{\circ}\text{C}$

Specifications subject to change without notice.



Applicaion Information

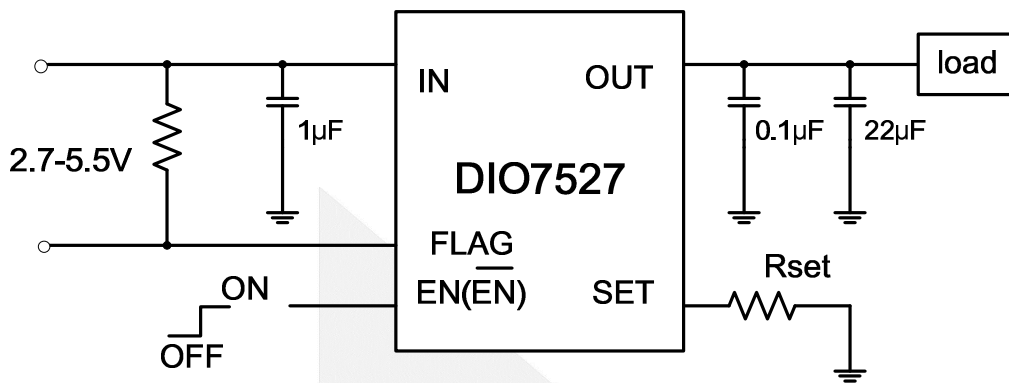


Figure 2 Typical Characteristics Reference Schematic

Operation Information

DIO7527 is a current limited P-channel MOSFET power switch with over current, thermal shutdown, input UVLO and output reverse-voltage condition.

Over-current Protection

When the over-current condition is detected, the switch is regulated to achieve constant output current. If the over current condition lasts for a long time, and results in a junction temperature over 140°C, the switch will be shutdown. Once the junction temperature drops to 120°C, the part will restart.

Supply Filter Capacitor

In order to prevent the input voltage from dropping during hot-plug condition, a 10μF ceramic capacitor from V_{IN} to GND is strongly recommended. However, higher capacitance could help reduce the voltage drop. Further more an output short will cause ringing on the input without the input capacitor. It could destroy the internal circuitry when the input transient voltage exceeds the absolute maximum supply voltage even for a short duration.

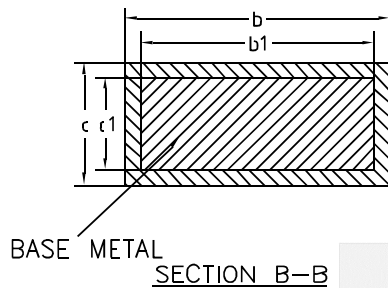
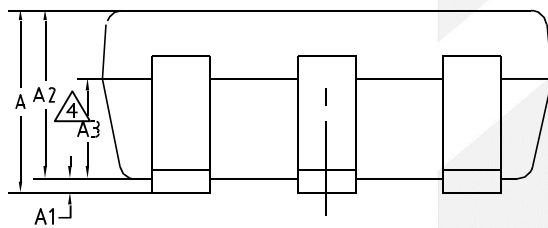
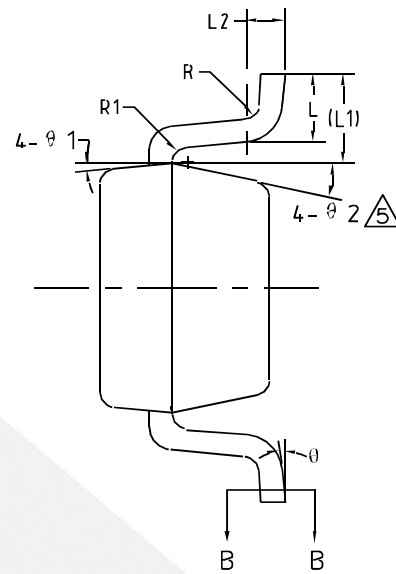
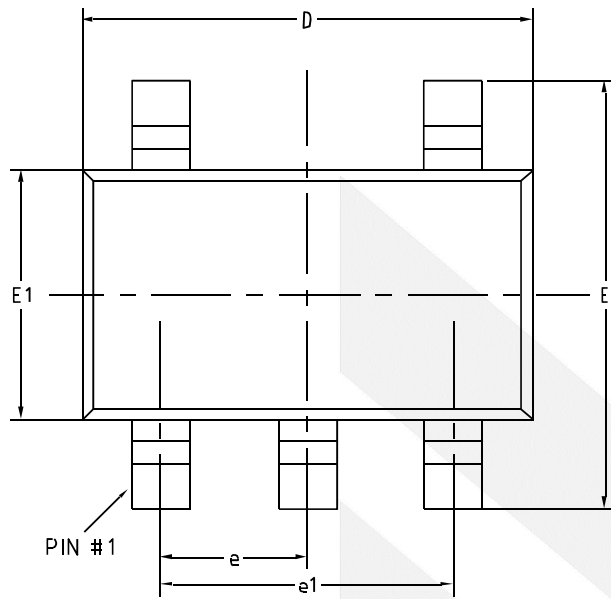
Current Limiting Setting

Current limit is programmable to protect the power source from over current and short circuit conditions. Connect a resistor R_{SET} from I_{SET} pin to GND to program the current limit:

$$I_{OS}(A) = 39K / R_{set} (\Omega).$$

The minimum current limit is 0.4A. Current limit beyond 2A is not recommended.

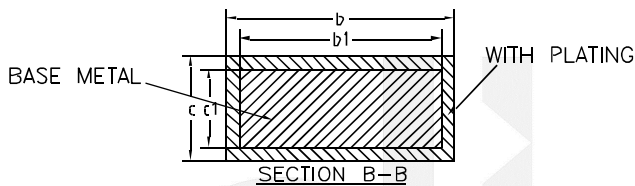
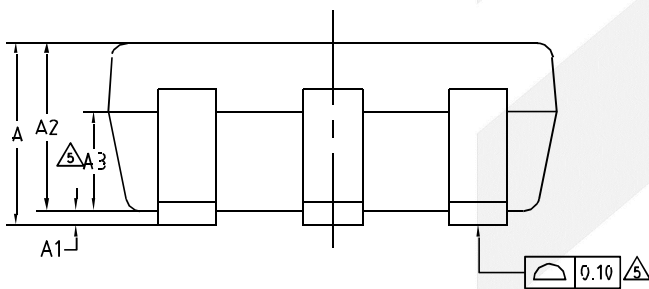
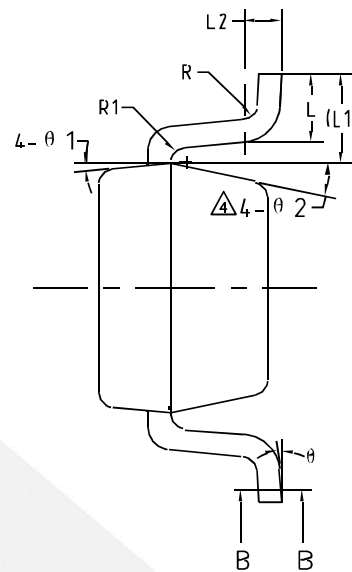
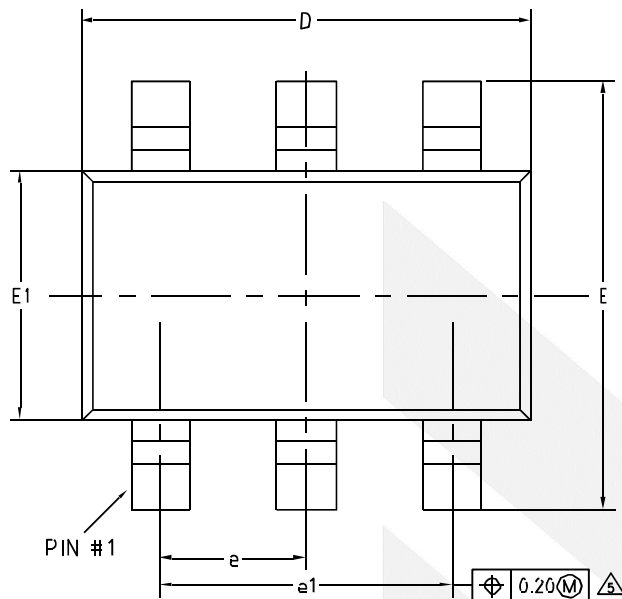
Physical Dimensions: SOT23-5



BASE METAL
SECTION B-B

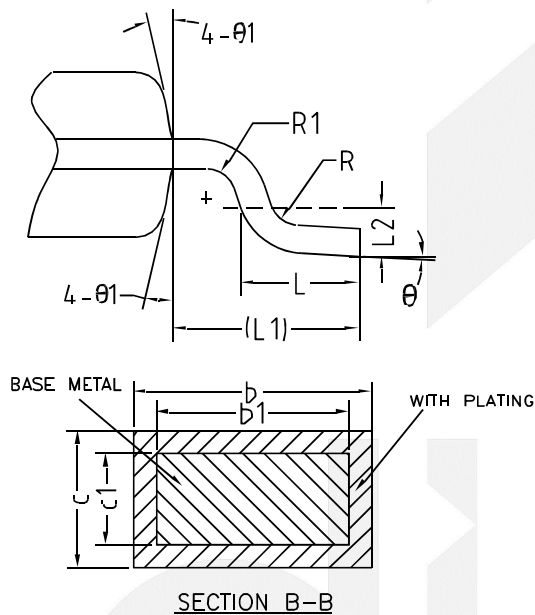
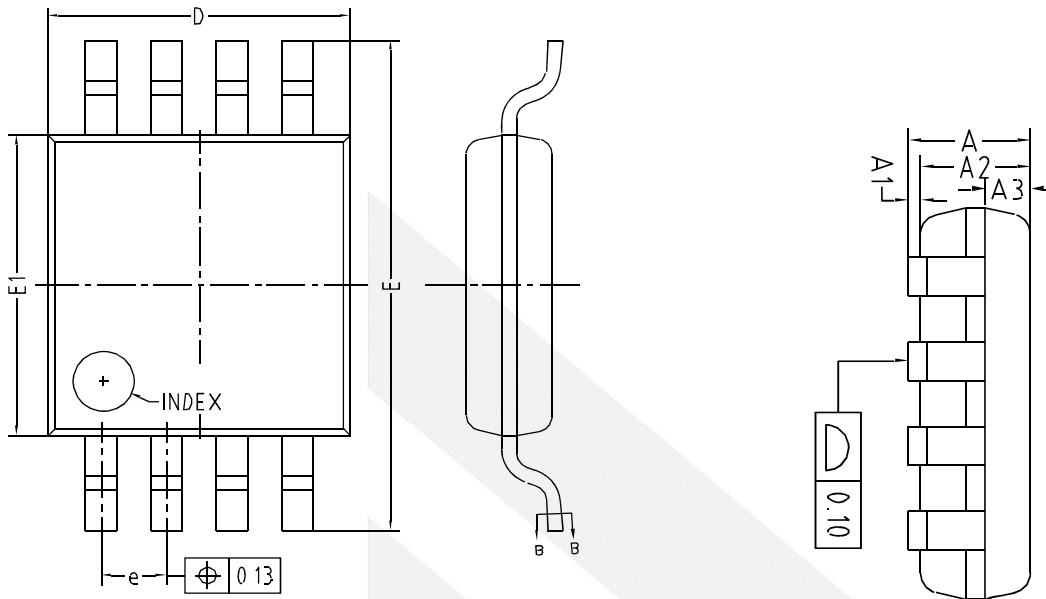
COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.25
A1	0	-	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	-	0.50
b1	0.36	0.38	0.45
c	0.14	-	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	-	-
R1	0.10	-	0.20
θ	0°	-	8°
θ1	3°	5°	7°
θ2	6°	-	14°

Physical Dimensions: SOT-23-6



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.25
A1	0	-	0.15
A2	1.00	1.10	1.20
A3	0.60	0.65	0.70
b	0.36	-	0.50
b1	0.36	0.38	0.45
c	0.14	-	0.20
c1	0.14	0.15	0.16
D	2.826	2.926	3.026
E	2.60	2.80	3.00
E1	1.526	1.626	1.726
e	0.90	0.95	1.00
e1	1.80	1.90	2.00
L	0.35	0.45	0.60
L1	0.59REF		
L2	0.25BSC		
R	0.10	-	-
R1	0.10	-	0.20
θ	0°	-	8°
θ1	3°	5°	7°
θ2	6°	-	14°

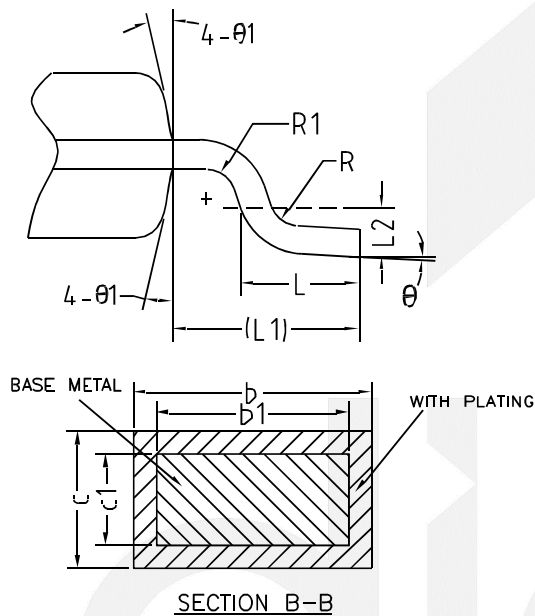
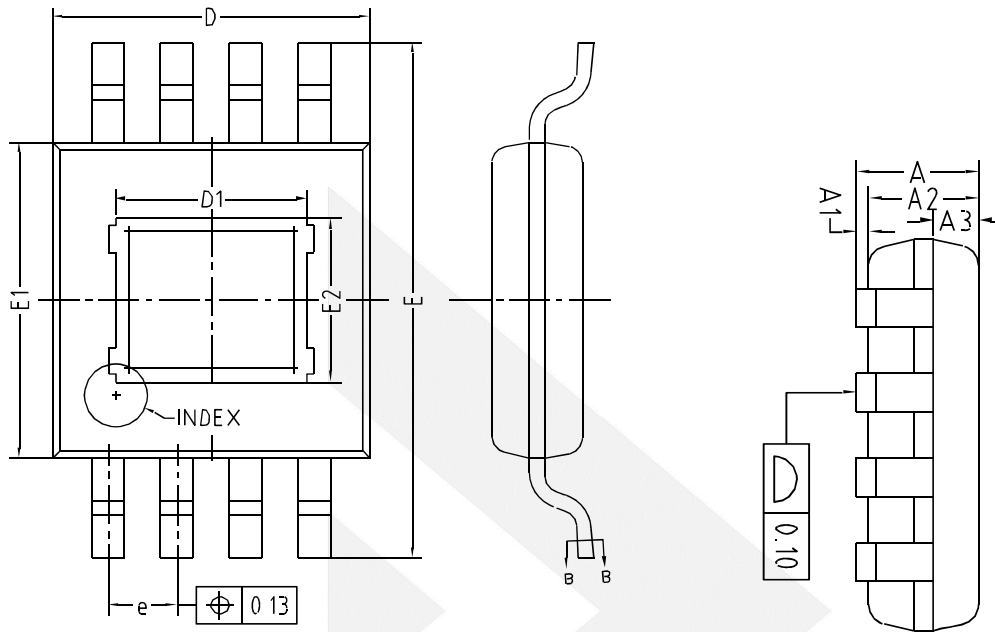
Physical Dimensions: MSOP-8



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.10
A1	0	-	0.15
A2	0.75	0.85	0.95
A3	0.25	0.35	0.39
b	0.28	-	0.37
b1	0.27	0.30	0.33
c	0.15	-	0.20
c1	0.14	0.15	0.16
D	2.90	3.00	3.10
E	4.70	4.90	5.10
E1	2.90	3.00	3.10
e	0.55	0.65	0.75
L	0.40	0.60	0.80
L1	0.95REF		
L2	0.25BSC		
R	0.07	-	-
R1	0.07	-	-
θ	0°	-	8°
θ1	9°	12°	15°

Physical Dimensions: EP-MSOP-8

5.5V Current Limited Load Switch



COMMON DIMENSIONS (UNITS OF MEASURE=MILLIMETER)			
Symbol	MIN	NOM	MAX
A	-	-	1.10
A1	0	-	0.15
A2	0.75	0.85	0.95
A3	0.25	0.35	0.39
b	0.28	-	0.37
b1	0.27	0.30	0.33
c	0.15	-	0.20
c1	0.14	0.15	0.16
D	2.90	3.00	3.10
D1	0.75	-	2.50
E	4.70	4.90	5.10
E1	2.90	3.00	3.10
E2	0.75	-	2.50
e	0.55	0.65	0.75
L	0.40	0.60	0.80
L1	0.95REF		
L2	0.25BSC		
R	0.07	-	-
R1	0.07	-	-
Θ	0°	-	8°
Θ1	9°	12°	15°

CONTACT US

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