

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
20V	22mΩ@4.5V	6A
	30mΩ@2.5V	
-20V	50mΩ@4.5V	-5A
	70mΩ@2.5V	

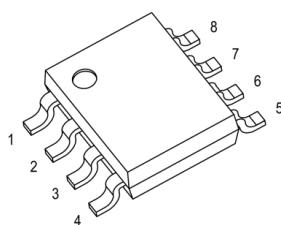
Feature

- Low On-Resistance
- Low Input Capacitance
- Fast Switching Speed
- Low Input/Output Leakage
- Fast Switching Speed

Application

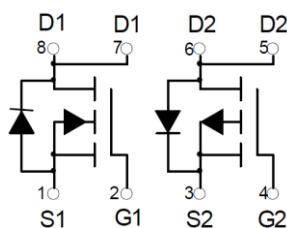
- Motor Control
- Power Management Functions
- DC-DC Converters
- Back lighting

Package

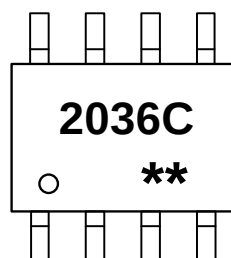


SOP-8L

Circuit diagram



Marking



2036C: Product code
 **: Week code.

**Maximum Ratings-Total Device(Ta=25°C unless otherwise noted)**

Parameter	Symbol	Value	Unit
Storage Temperature	T _{STG}	-55~ +150	°C

Maximum Ratings - N-Channel Q1(Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current	I _D	6	A

Maximum Ratings - P-Channel Q1(Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	-20	V
Gate-Source Voltage	V _{GS}	±12	V
Continuous Drain Current	I _D	-5	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance from Junction to Ambient	R _{θJA}	277	°C/W

Electrical characteristics - N-Channel Q1 (T_A=25 °C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =250μA	20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =20V, V _{GS} = 0V			1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±12V, V _{DS} = 0V			±0.1	μA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	0.5	0.7	1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =4.5V, I _D =4A		22	30	mΩ
		V _{GS} =2.5V, I _D =3A		30	40	
Dynamic characteristics						
Total gate charge	Q _g	V _{DS} =10V, V _{GS} =4.5V, I _D =4A		11		nC
Gate-source charge	Q _{gs}			2.3		
Gate-drain charge	Q _{gd}			2.5		
Input Capacitance	C _{iss}	V _{DS} =8V, V _{GS} =0V, f=1MHz		800		pF
Output Capacitance	C _{oss}			155		
Reverse Transfer Capacitance	C _{rss}			125		
Switching Characteristics						
Turn-on delay time	t _{d(on)}	V _{DD} =10V , V _{GS} =4V , I _D =1A R _G =10Ω		18		ns
Turn-on rise time	t _r			5		
Turn-off delay time	t _{d(off)}			43		
Turn-off fall time	t _f			20		

**Source-Drain Diode characteristics**

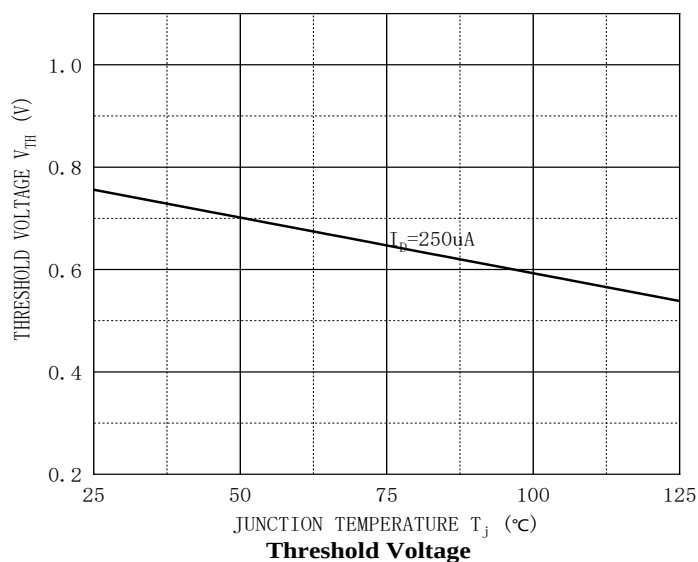
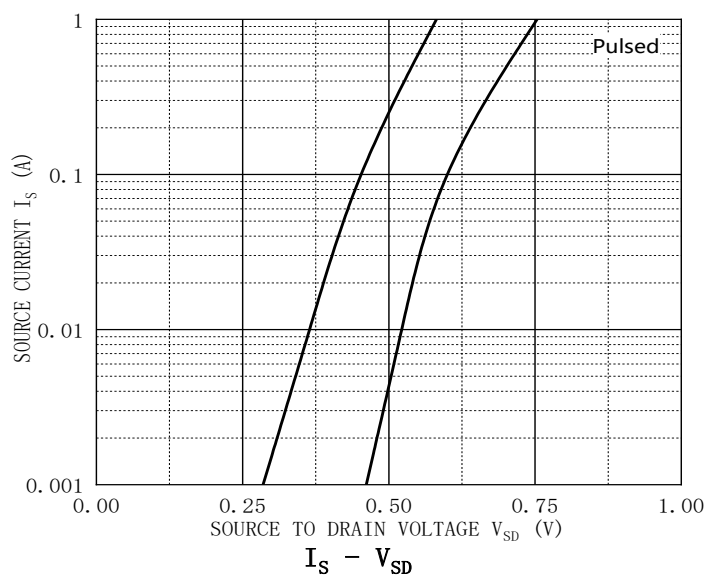
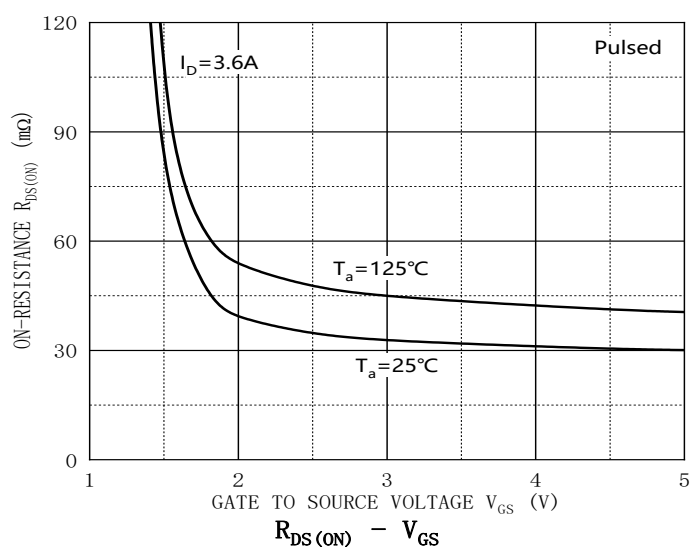
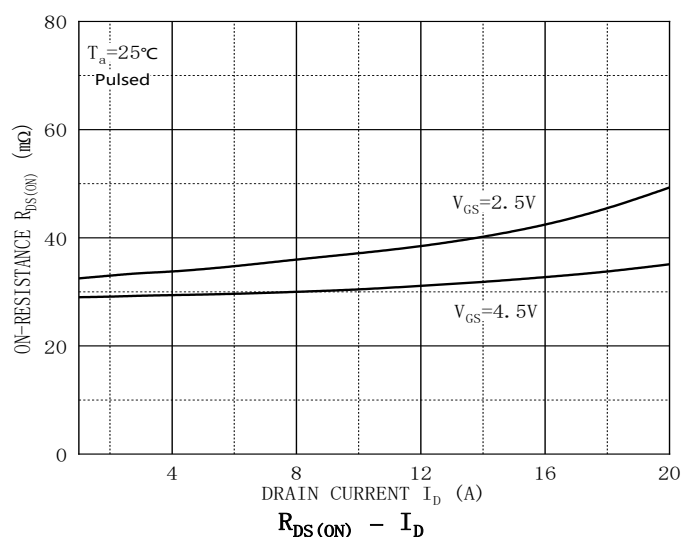
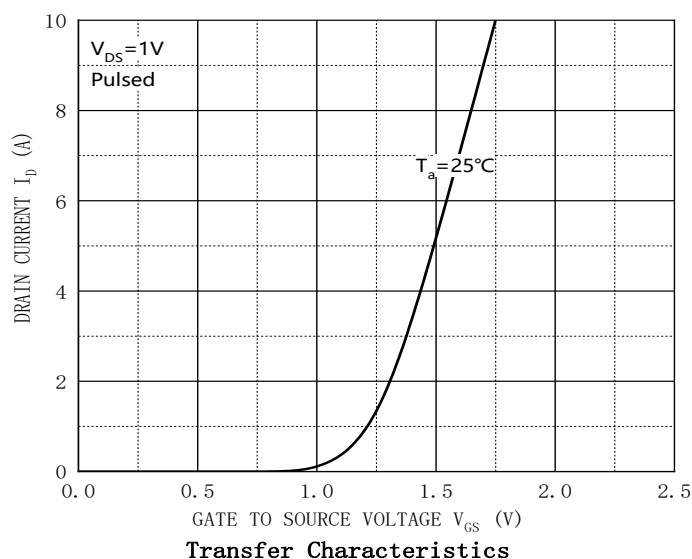
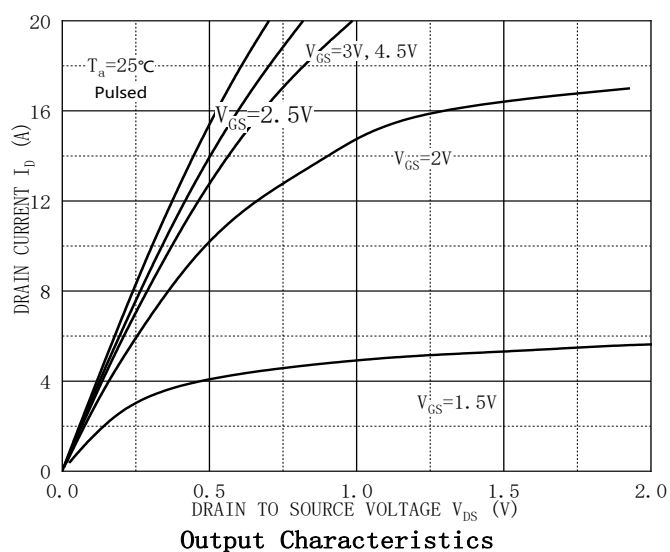
Diode forward voltage	V_{SD}	$I_S=1A, V_{GS}=0V$			1.3	V
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Electrical characteristics - P-Channel Q2 ($T_A=25^\circ C$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D =-250μA	-20			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =-16V,V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} =±12V, V _{DS} = 0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D = -250μA	-0.5	-0.7	-1	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} = -4.5V, I _D = -3A		50	60	mΩ
		V _{GS} = -2.5V, I _D = -1A		70	90	
Dynamic characteristics						
Input Capacitance	C _{iss}	V _{DS} =-10V,V _{GS} =0V,f=1MHz		405		pF
Output Capacitance	C _{oss}			75		
Reverse Transfer Capacitance	C _{rss}			55		
Gate resistance	R _g	f =1MHz		6		Ω
Total Gate Charge	Q _g	V _{DS} =-10V,V _{GS} =-2.5V,ID=-3A		3.3	12	nC
Gate-Source Charge	Q _{gs}			0.7		
Gate-Drain Charge	Q _{gd}			1.3		
Turn-on delay time	t _{d(on)}	V _{DD} =-10V,V _{GEN} =-4.5V,I _D =-1A R _L =10Ω,R _{GEN} =1Ω		11		ns
Turn-on rise time	t _r			35		
Turn-off delay time	t _{d(off)}			30		
Turn-off fall time	t _f			10		
Source-Drain Diode characteristics						
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =-1A			-1.3	V

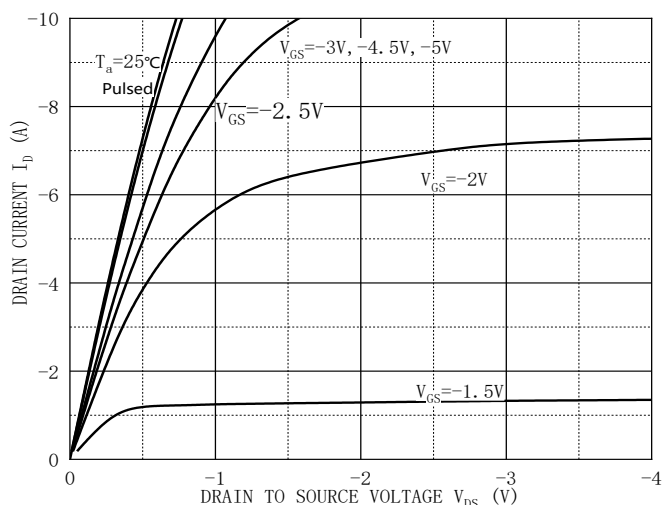


Typical Characteristics - N-Channel Q1

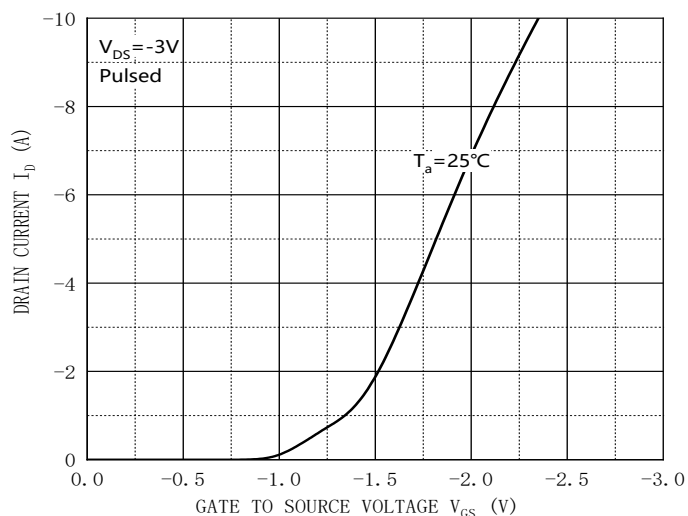




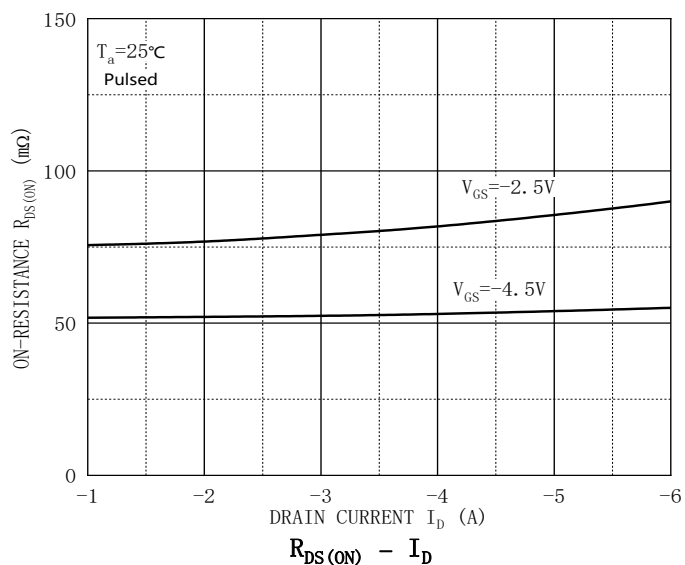
Typical Characteristics - P-Channel Q2



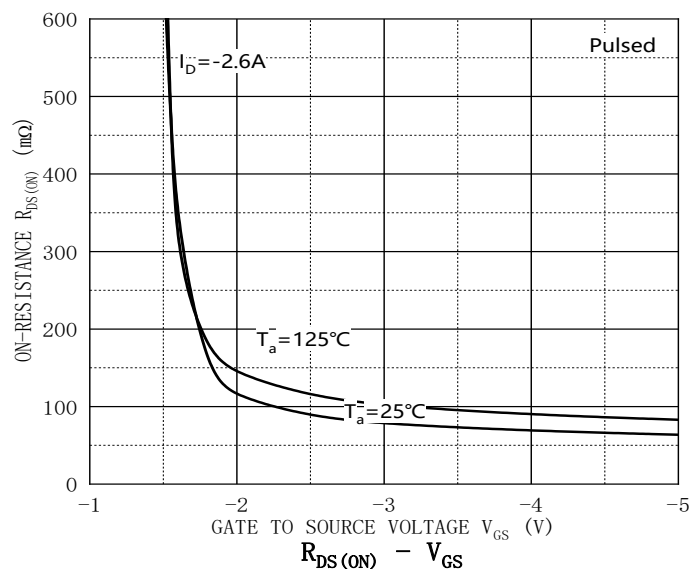
Output Characteristics



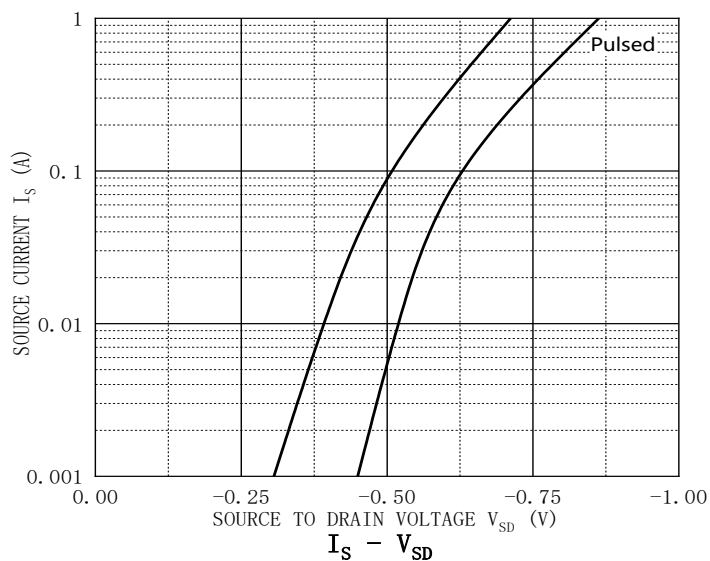
Transfer Characteristics



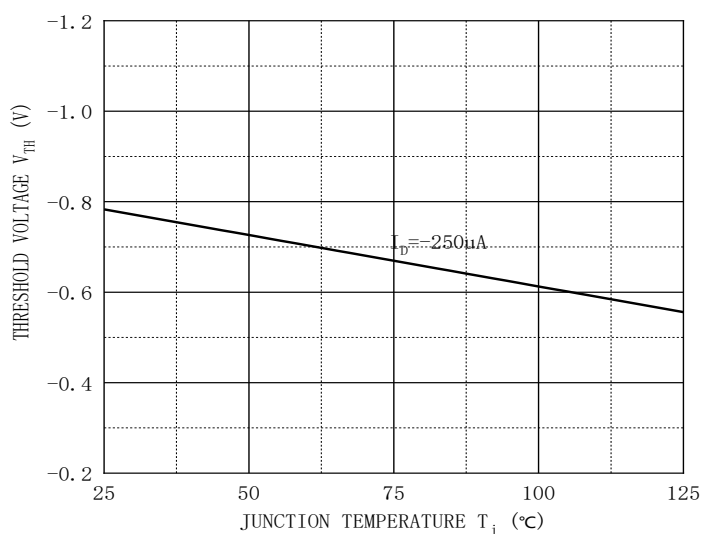
$R_{DS(on)} - I_D$



$R_{DS(on)} - V_{GS}$



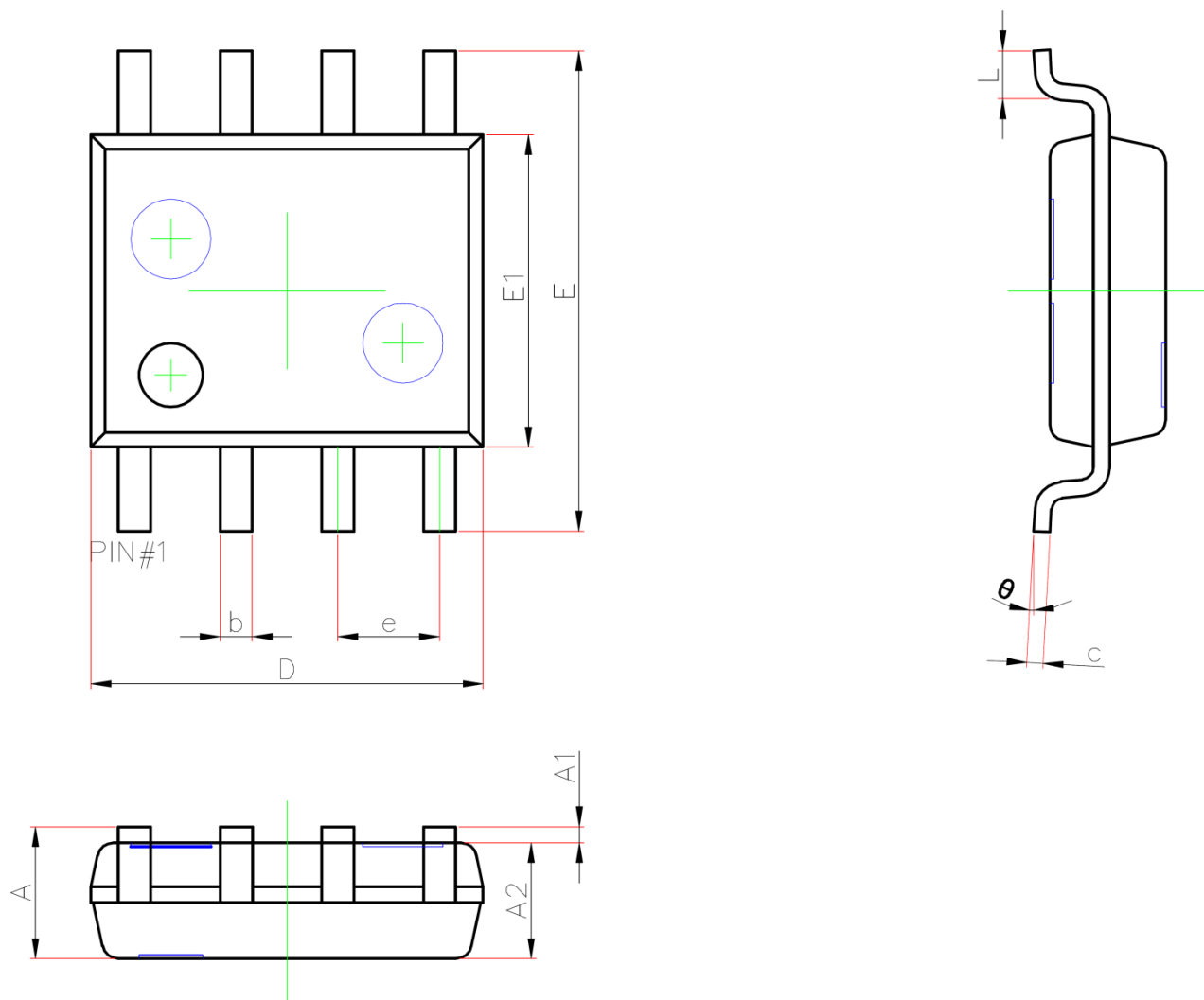
$I_S - V_{SD}$



Threshold Voltage



SOP-8L Package Information



Symbol	Dimensions In Millimeters	
	Min.	Max.
A	1.35	1.75
A1	0.10	0.25
A2	1.35	1.55
b	0.33	0.51
c	0.17	0.25
D	4.80	5.00
e	1.27 REF.	
E	5.80	6.20
E1	3.80	4.00
L	0.40	1.27
θ	0°	8°