● General Description

The CH100N02D combines advanced trench MOSFET technology with a low resistance package to provide extremely low $R_{DS(ON)}$. This device is ideal for load switch and battery protection applications.

● Features

■ Advance high cell density Trench technology

■Low $R_{DS(ON)}$ to minimize conductive loss

■Low Gate Charge for fast switching ■Low Thermal resistance

●Application

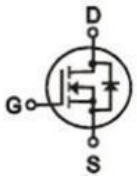
■MB/VGA Vcore

■SMPS 2nd Synchronous Rectifier

■POL application

■BLDC Motor driver

● Product Summary



V_{DS} =20V

$R_{DS(ON)}$ =3.9mΩ

I_D =100A

RoHS

TO-252

●Ordering Information:

Part NO.	CH100N02D
Marking	CH100N02D
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

●Absolute Maximum Ratings (T_C =25℃)

Parameter	**Symbol**	Rating	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	12	V
Continuous Drain Current	$I_{D@TC=25℃}$	100	A
	$I_{D@TC=75℃}$	65	A
	$I_{D@TC=100℃}$	59	A
Pulsed Drain Current ①	I_{DM}	340	A
Total Power Dissipation(TC=25℃)	$P_{D@TC=25℃}$	87	W
Total Power Dissipation(TC=100℃)	$P_{D@TA=100℃}$	43	W
Operating Junction Temperature	T_J	-55 to 175	℃
Storage Temperature	T_{STG}	-55 to 175	℃
Single Pulse Avalanche Energy@L=0.1mH	E_{AS}	340	mJ
Avalanche Current@L=0.1mH	I_{AS}	80	A

●Thermal resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R_{thJC}	-	-	1.72	°C/W
Thermal resistance, junction - ambient	R_{thJA}	-	-	98.5	°C/W
Soldering temperature, wavesoldering for 10s	T_{sold}	-	-	265	℃

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} =0V,I_D =250uA	20			V
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} =V_{DS}, I_D =250uA	0.5	0.7	1.1	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=20V, V_{GS} =0V			1.0	uA
Gate- Source Leakage Current	I_{GSS}	V_{GS}=±12V ,V_{DS} =0V			±100	nA
Static Drain-source On Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=20A		3.9	5.5	mΩ
		V_{GS}=2.5V, I_D=15A		6	9	mΩ
Forward Transconductance	g_{FS}	V_{DS} =15V, I_D=10A		16		s
Source-drain voltage	V_{SD}	Is=20A V_{GS}=20A			1.20	V

●Electronic Characteristics

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C_{iss}	f = 1MHz	-	2800	-	pF
Output capacitance	C_{oss}		-	353	-	
Reverse transfer capacitance	C_{rss}		-	265	-	

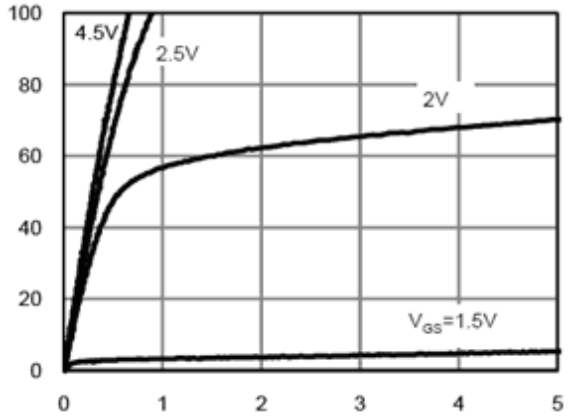
●Gate Charge characteristics(T_a = 25℃)

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q_g	V_{Ds} =10V	-	32	-	nC
Gate - Source charge	Q_{gs}	I_D = 12A	-	3	-	
Gate - Drain charge	Q_{gd}	V_{GS} = 4.5V	-	11	-	

Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

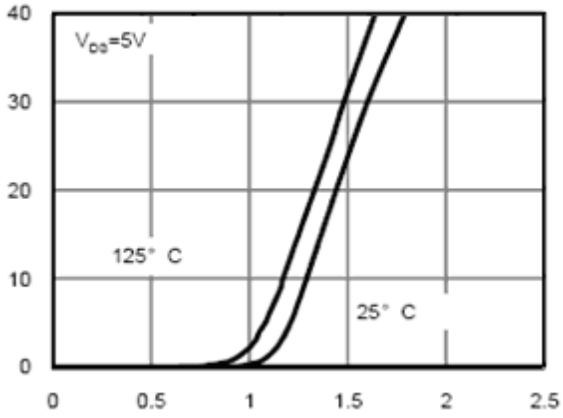
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure 1. Output Characteristics



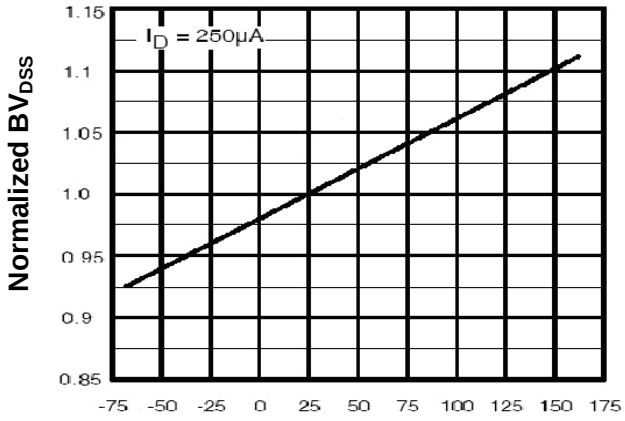
VDS Drain-to-Source Voltage(V)

Figure 2. Transfer Characteristics



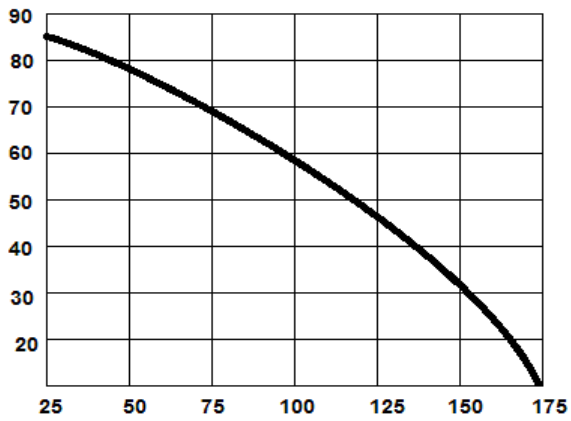
VGS Gate-to-Source Voltage(V)

Figure 3. Max BV_{DSS} vs Junction Temperature



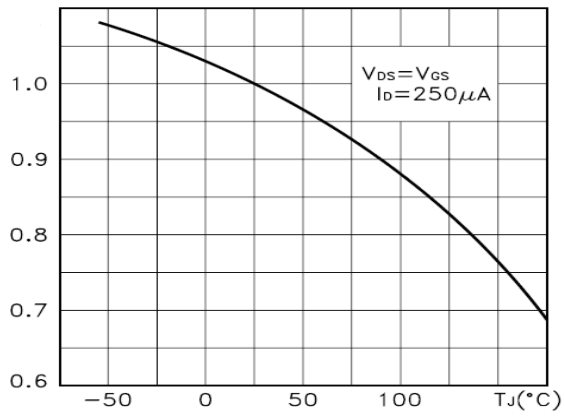
T_J-Junction Temperature(℃)

Figure 4. Drain Current



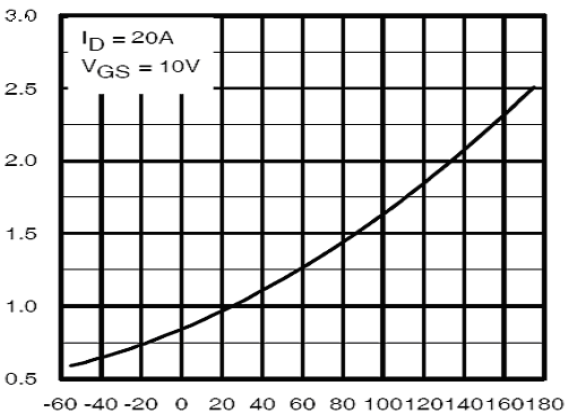
T_J-Junction Temperature(℃)

Figure 5. $V_{GS(th)}$ vs Junction Temperature



T_J-Junction Temperature(℃)

Figure 6. $R_{DS(ON)}$ vs Junction Temperature



T_J-Junction Temperature(℃)

Figure 7. Gate Charge Waveforms

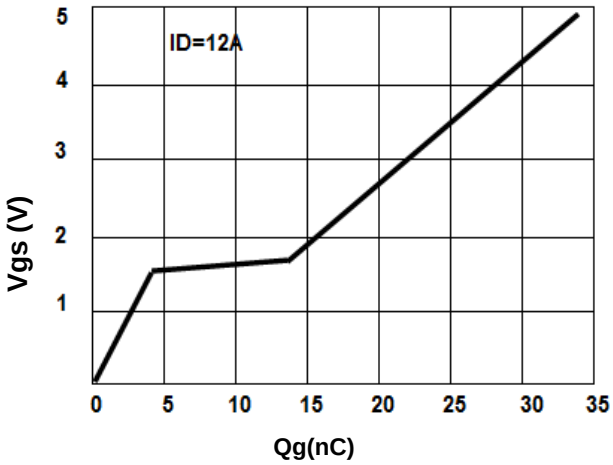


Figure 8. Capacitance

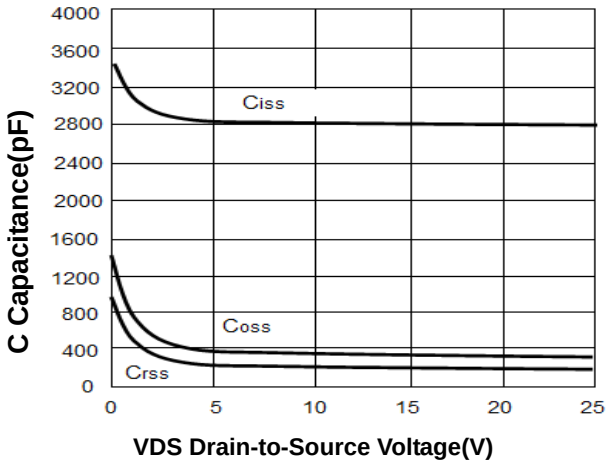


Figure 9. Body-Diode Characteristics

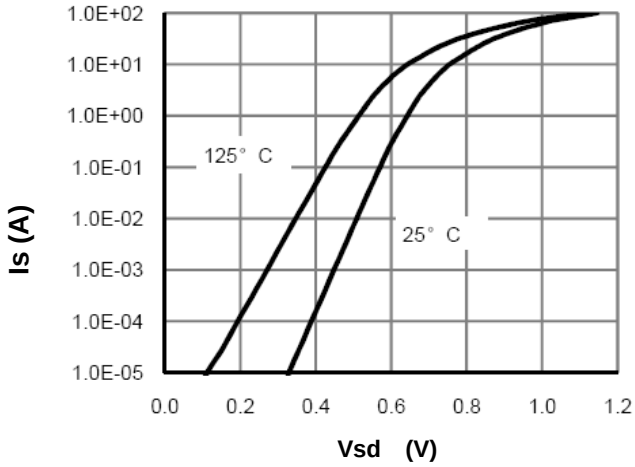


Figure 10. Maximum Safe Operating Area

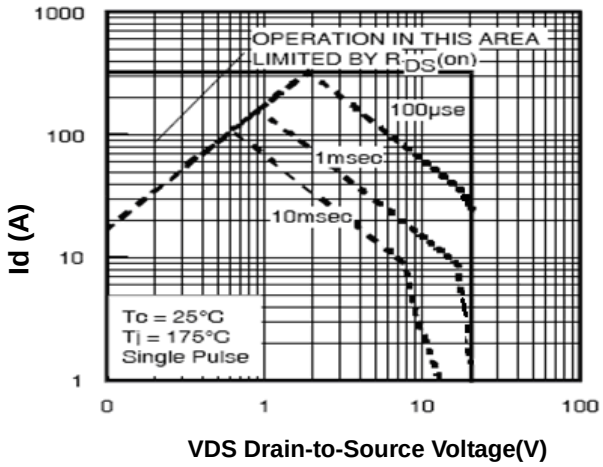
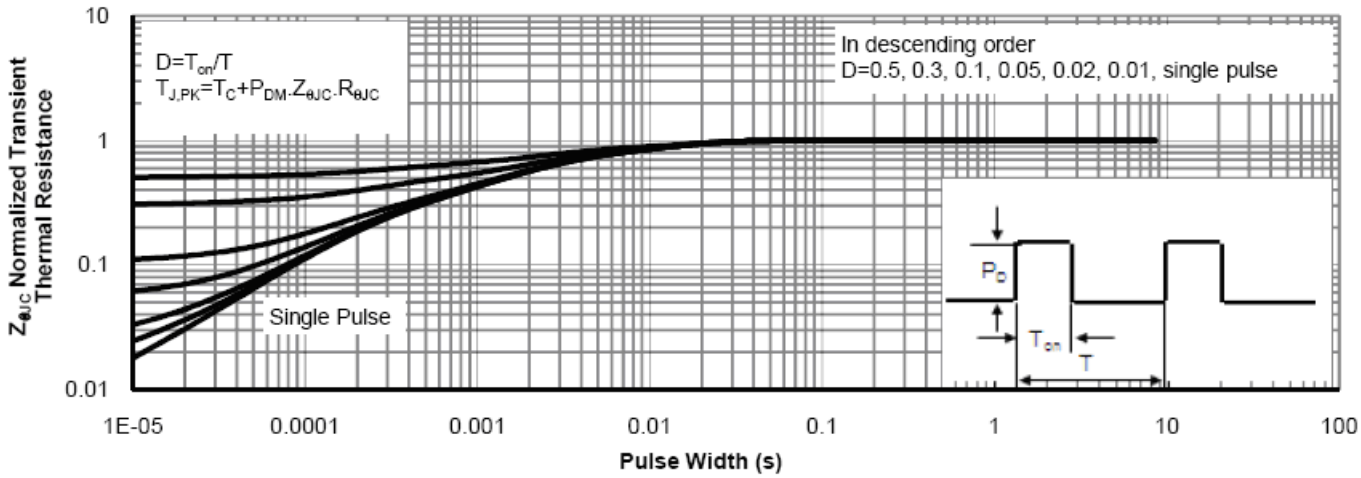
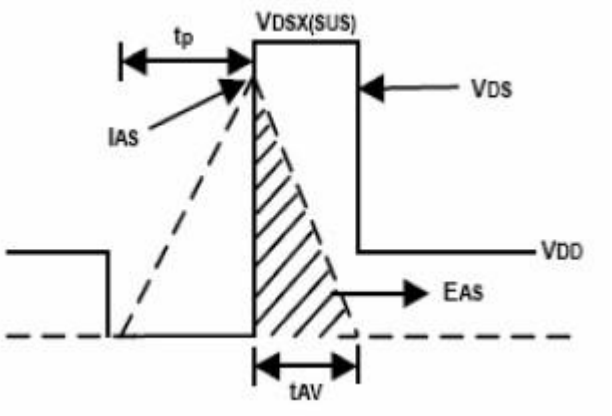


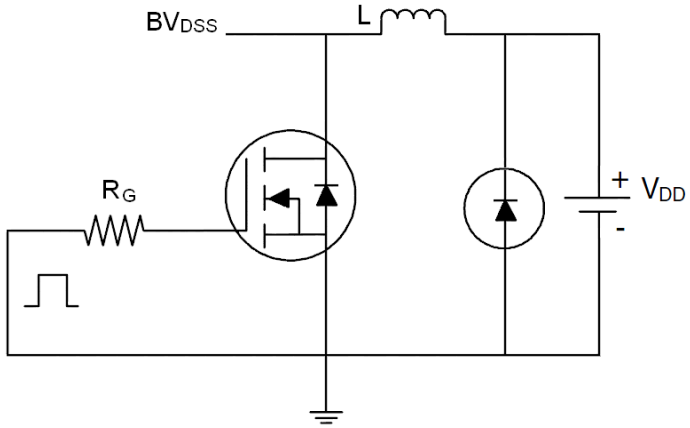
Figure 11. Normalized Maximum Transient Thermal Impedance



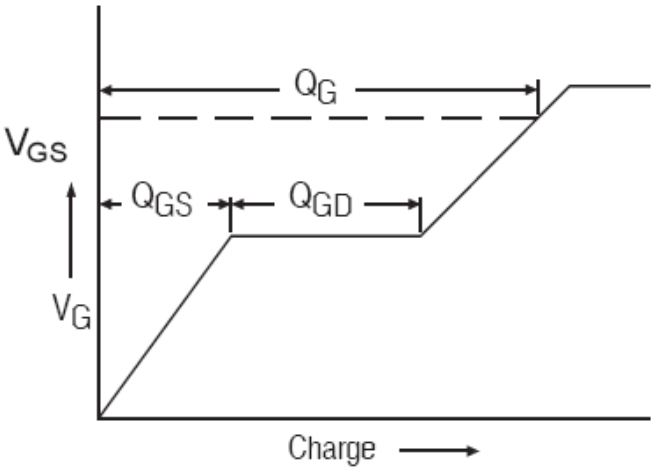
Test Circuit

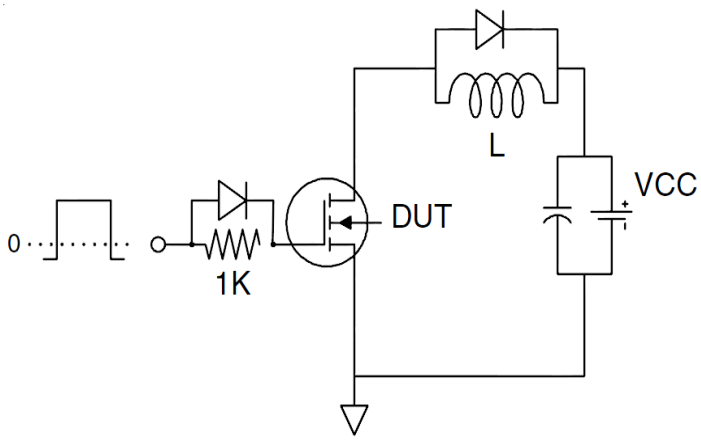
1) E_{AS} Test Circuits



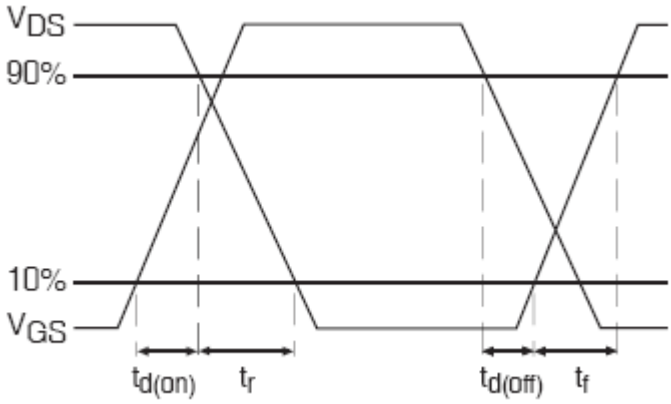


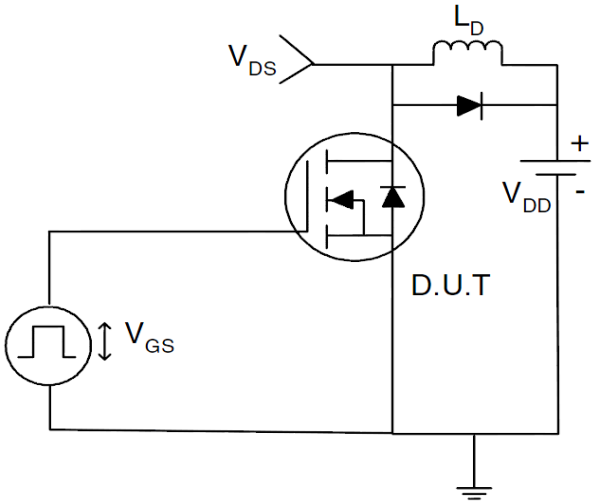
2) Gate Charge Test Circuit:



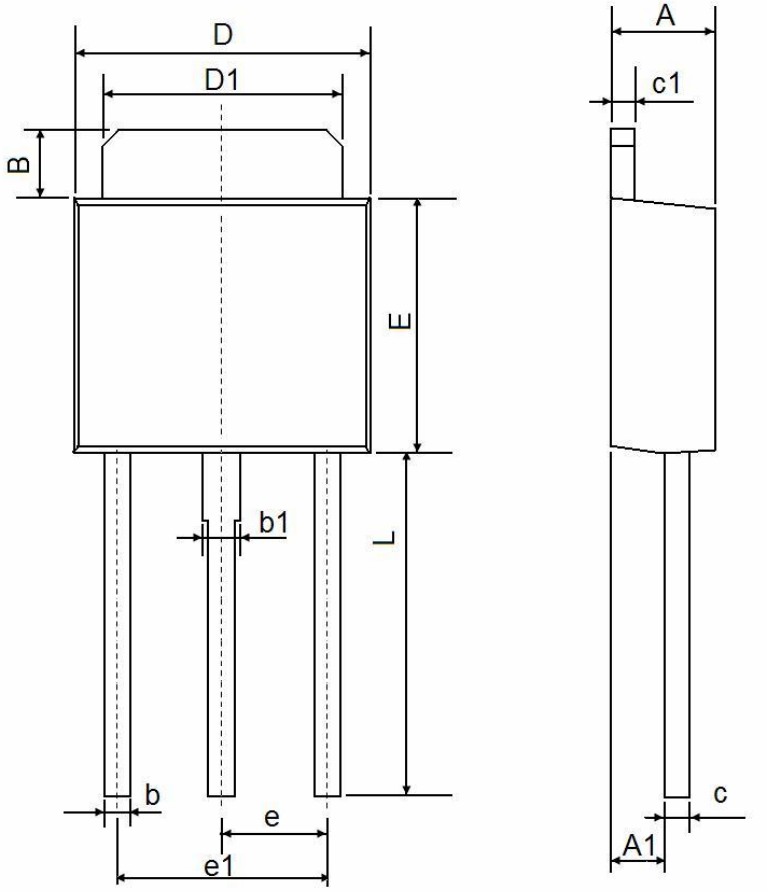


3) Switch Time Test Circuit:



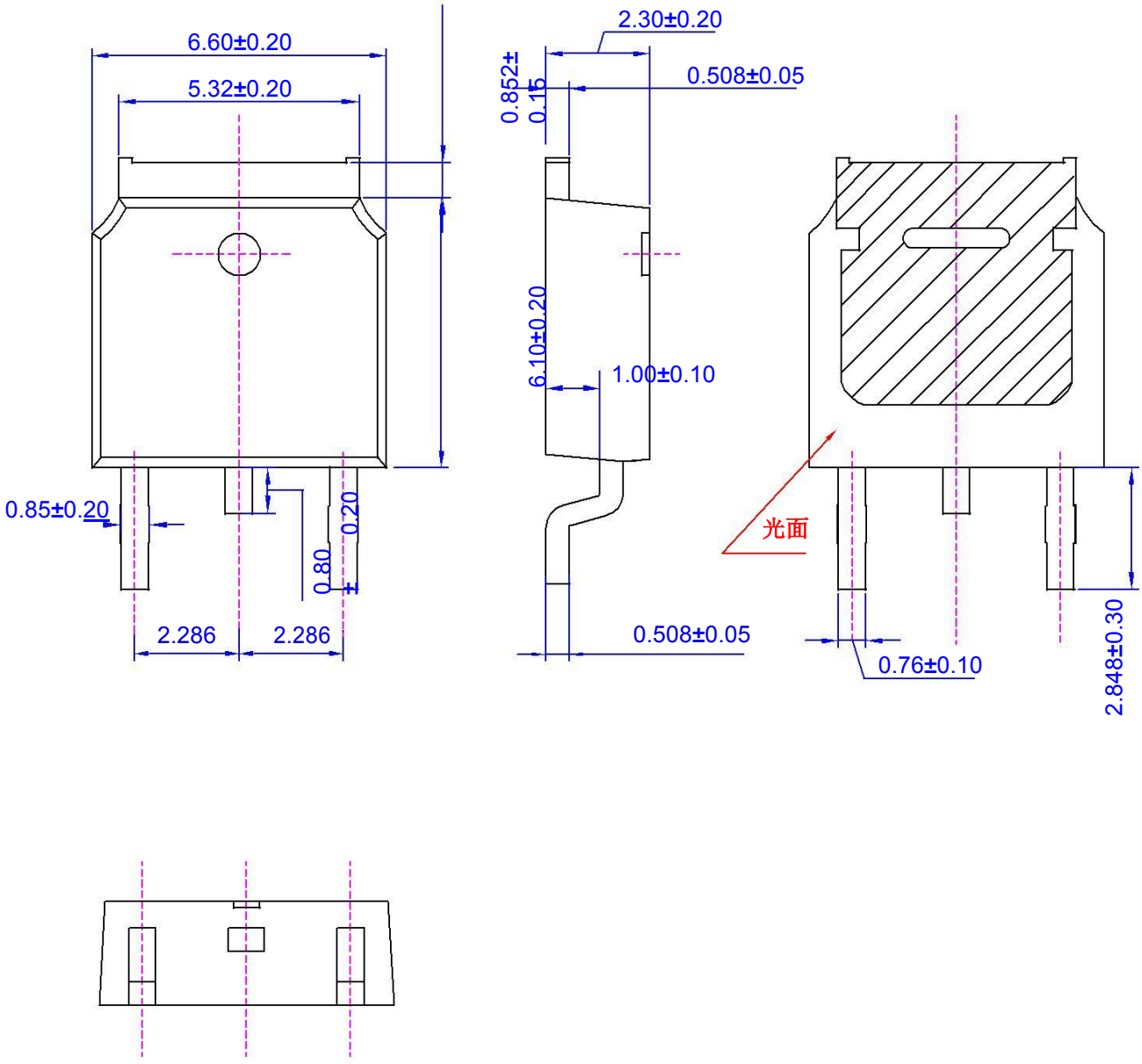


TO-251 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	1.050	1.350	0.042	0.054
B	1.350	1.650	0.053	0.065
b	0.500	0.700	0.020	0.028
b1	0.700	0.900	0.028	0.035
c	0.430	0.580	0.017	0.023
c1	0.430	0.580	0.017	0.023
D	6.350	6.650	0.250	0.262
D1	5.200	5.400	0.205	0.213
E	5.400	5.700	0.213	0.224
e	2.300 TYP.		0.091 TYP.	
e1	4.500	4.700	0.177	0.185
L	7.500	7.900	0.295	0.311

●Dimensions(TO-252)



注：

1.塑封体未标注为光面 Ra=0.1;亚光面 Ra=0.8

2.未注公差±0.15,未标注圆角 Rmax=0.25

3.塑封体无缺损、缩孔、裂纹、气泡等不良缺陷

4.标注单位 mm