

### • General Description

The CH15N100D 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.

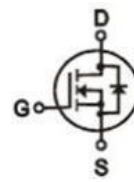
### • Features

- 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 2<sup>nd</sup> Synchronous Rectifier
- POL application
- BLDC Motor driver

### • Product Summary



$$V_{DS} = 100V$$

$$R_{DS(ON)} = 86m\Omega$$

$$I_D = 15A$$



TO-252

### • Ordering Information:

Part NO.	CH15N100D
Marking	CH15N100D
Packing Information	REEL TAPE
Basic ordering unit (pcs)	2500

### • Absolute Maximum Ratings ( $T_c = 25^\circ C$ )

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	100	V
Gate-Source Voltage	$V_{GS}$	20	V
Continuous Drain Current	$I_D @ TC=25^\circ C$	15	A
	$I_D @ TC=75^\circ C$	10	A
	$I_D @ TC=100^\circ C$	6.5	A
Pulsed Drain Current	$I_{DM}$	40	A
Total Power Dissipation( $TC=25^\circ C$ )	$P_D @ TC=25^\circ C$	40	W
Total Power Dissipation( $TA=100^\circ C$ )	$P_D @ TC=100^\circ C$	30	W
Operating Junction Temperature	$T_J$	-55 to 175	$^\circ C$
Storage Temperature	$T_{STG}$	-55 to 175	$^\circ C$
Single Pulse Avalanche Energy@L=0.1mH	$E_{AS}$	100	mJ
Avalanche Current@L=0.1mH	$I_{AS}$	55	A

**•Thermal resistance**

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal resistance, junction - case	R <sub>thJC</sub>	-	2.7		°C/W
Thermal resistance, junction - ambient	R <sub>thJA</sub>	-	-	100	°C/W
Soldering temperature, wavesoldering for 10s	T <sub>sold</sub>	-	-	125	°C

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250uA	100			V
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = 250uA	1	1.5	2.5	V
Drain-Source Leakage Current	I <sub>DSS</sub>	V <sub>DS</sub> = 100V, V <sub>GS</sub> = 0V			1.0	uA
Gate- Source Leakage Current	I <sub>GSS</sub>	V <sub>GS</sub> = ±20V, V <sub>DS</sub> = 0V			±100	nA
Static Drain-source On Resistance	R <sub>Ds(ON)</sub>	V <sub>GS</sub> = 10V, I <sub>D</sub> = 15A		86	110	mΩ
		V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 8A		96	140	mΩ
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = 15V, I <sub>D</sub> = 10A		18		s
Source-drain voltage	V <sub>SD</sub>	I <sub>S</sub> = 20A			1.20	V

**•Electronic Characteristics**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Input capacitance	C <sub>iSS</sub>	f = 1MHz	-	610	-	pF
Output capacitance	C <sub>oss</sub>		-	40	-	
Reverse transfer capacitance	C <sub>rSS</sub>		-	25	-	

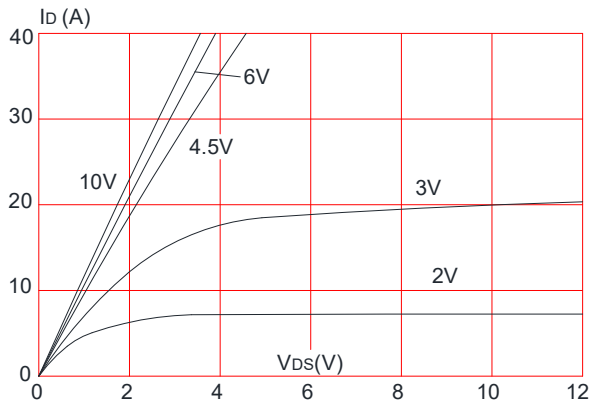
**•Gate Charge characteristics(T<sub>a</sub> = 25°C)**

Parameter	Symbol	Condition	Min.	Typ	Max.	Unit
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = 30V	-	12	-	nC
Gate - Source charge	Q <sub>gs</sub>	I <sub>D</sub> = 15A	-	2.2	-	
Gate - Drain charge	Q <sub>gd</sub>	V <sub>GS</sub> = 10V	-	2.5	-	

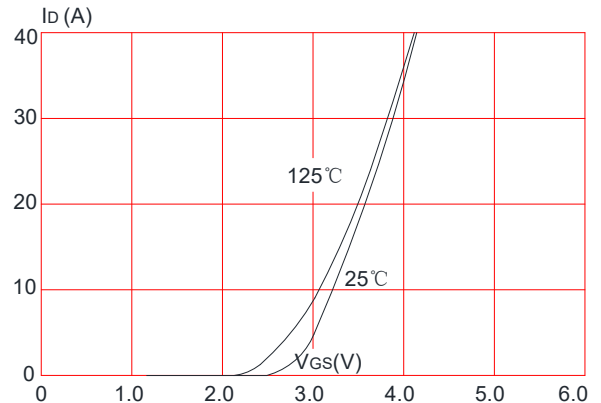
Note: ① Pulse Test : Pulse width ≤ 300μs, Duty cycle ≤ 2% ;

## Typical Performance Characteristics

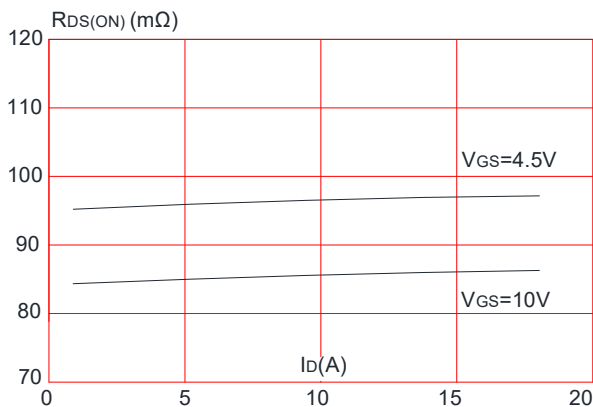
**Figure 1: Output Characteristics**



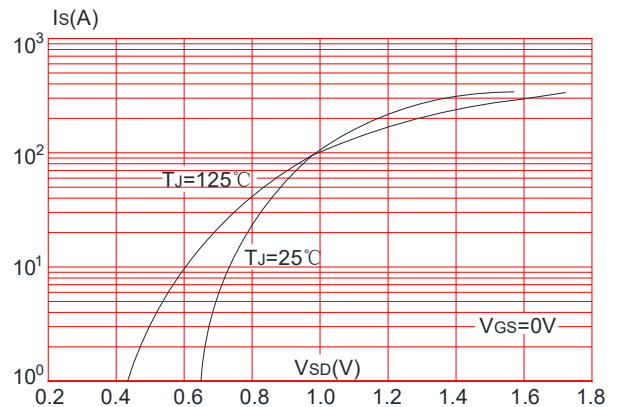
**Figure 2: Typical Transfer Characteristics**



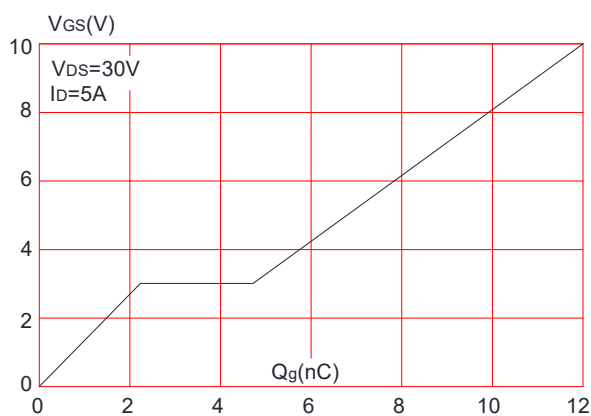
**Figure 3: On-resistance vs. Drain Current**



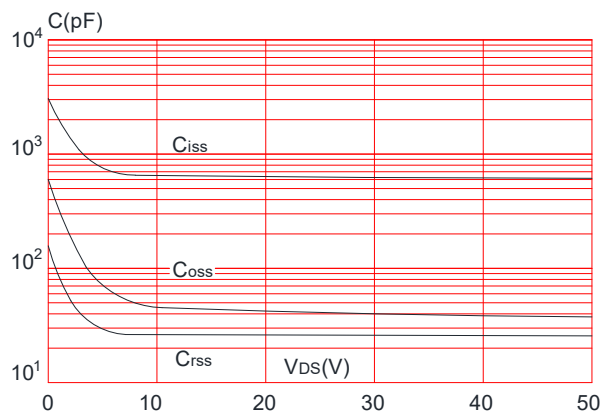
**Figure 4: Body Diode Characteristics**



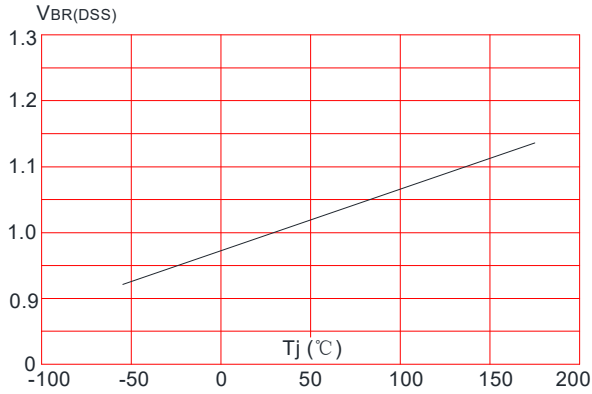
**Figure 5: Gate Charge Characteristics**



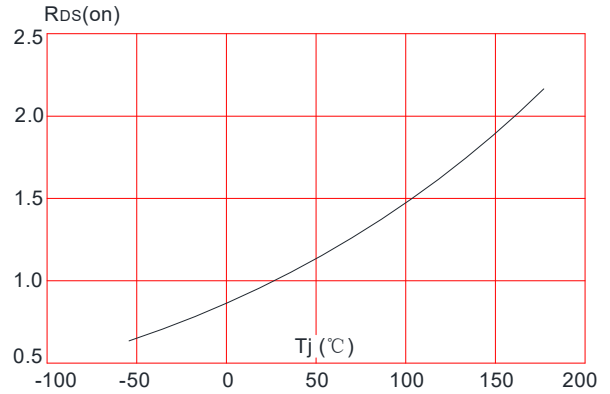
**Figure 6: Capacitance Characteristics**



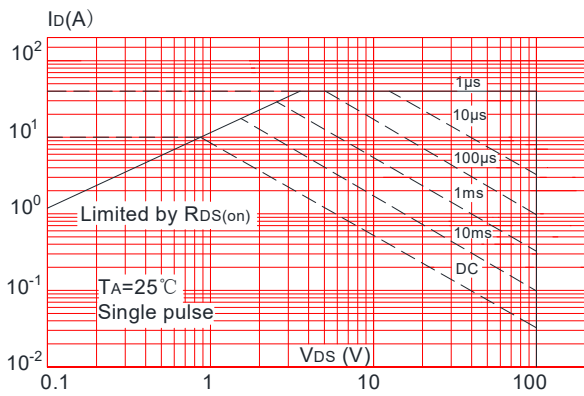
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



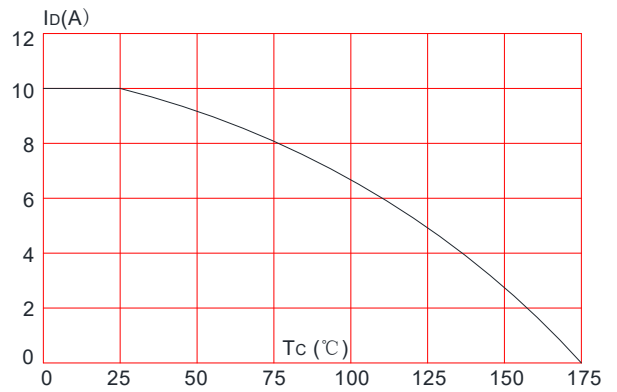
**Figure 8:** Normalized on Resistance vs. Junction Temperature



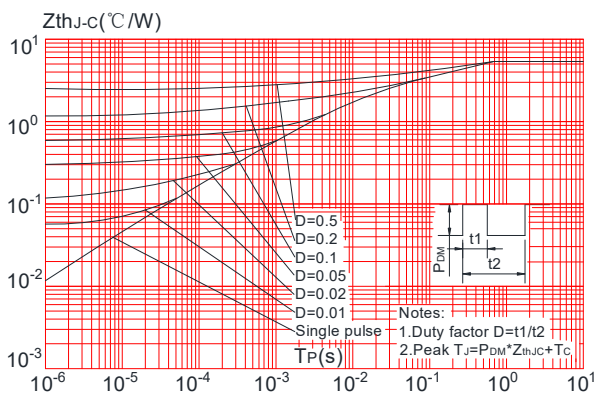
**Figure 9:** Maximum Safe Operating Area



**Figure 10:** Maximum Continuous Drain Current vs. Case Temperature



**Figure.11:** Maximum Effective Transient Thermal Impedance, Junction-to-Case



## Test Circuit

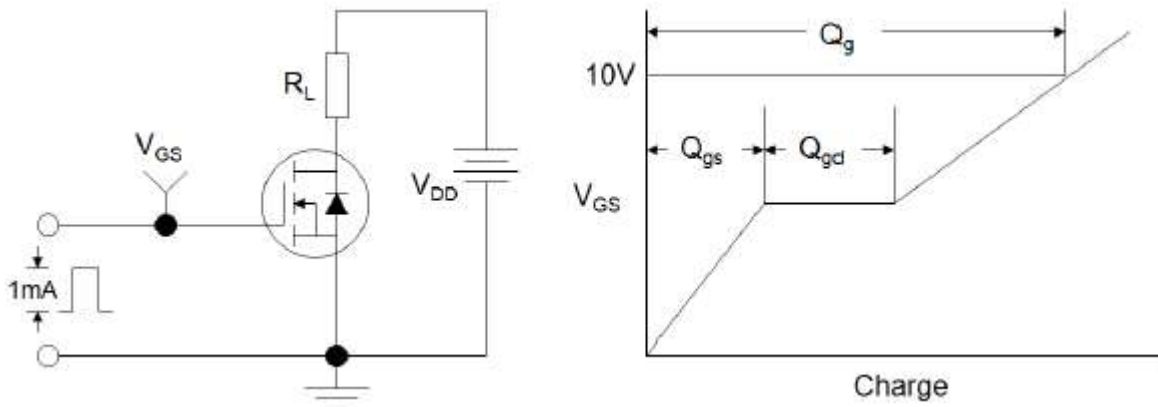


Figure 1: Gate Charge Test Circuit & Waveform

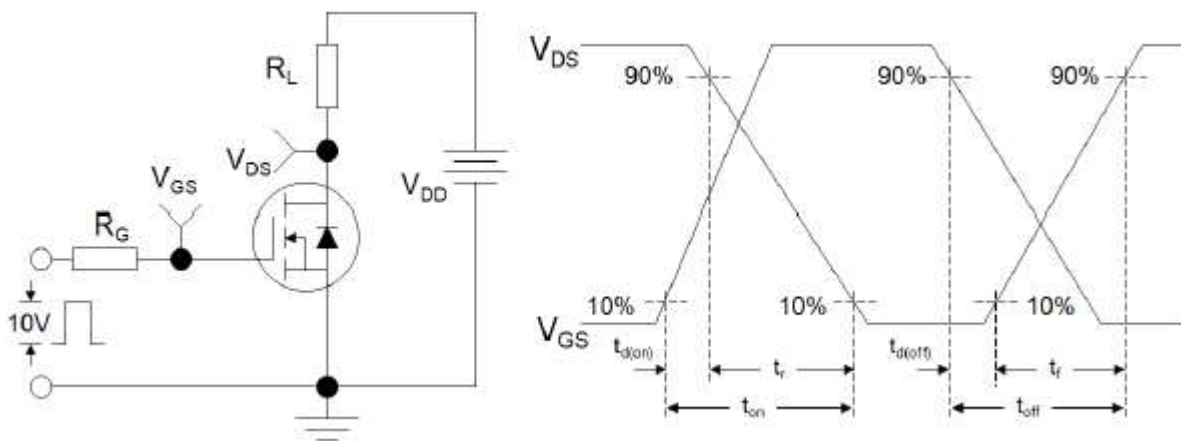


Figure 2: Resistive Switching Test Circuit & Waveforms

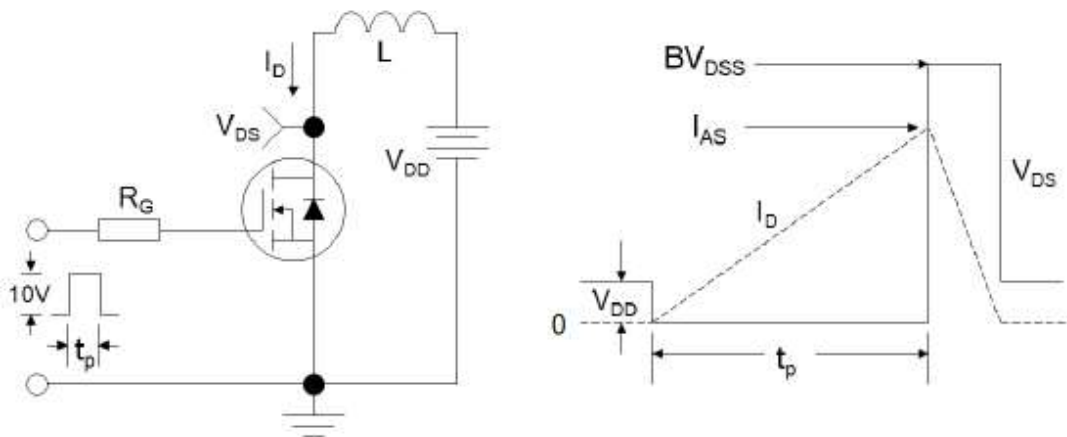
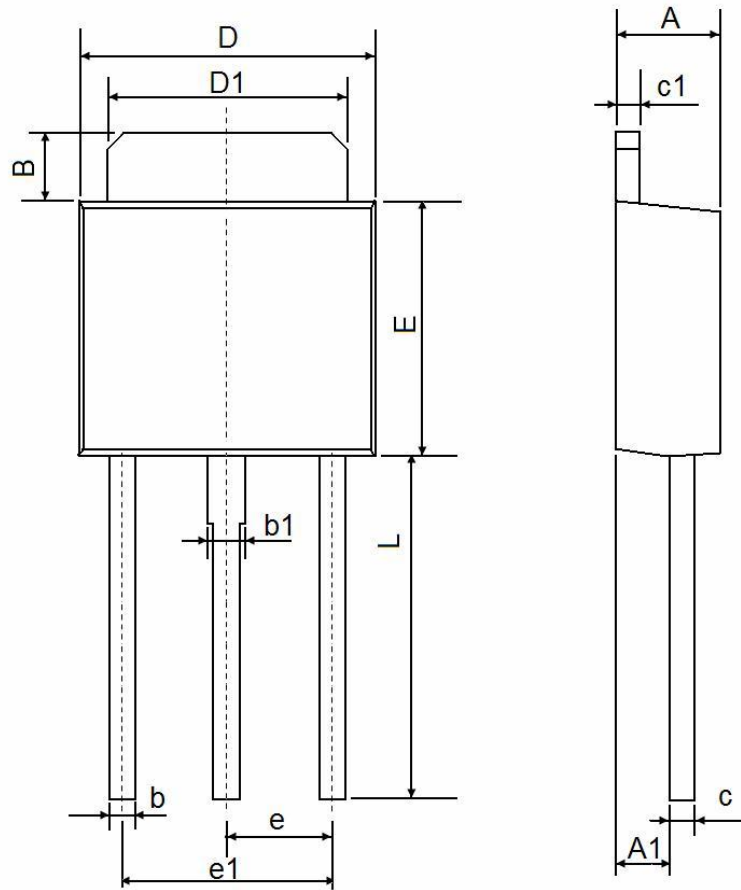
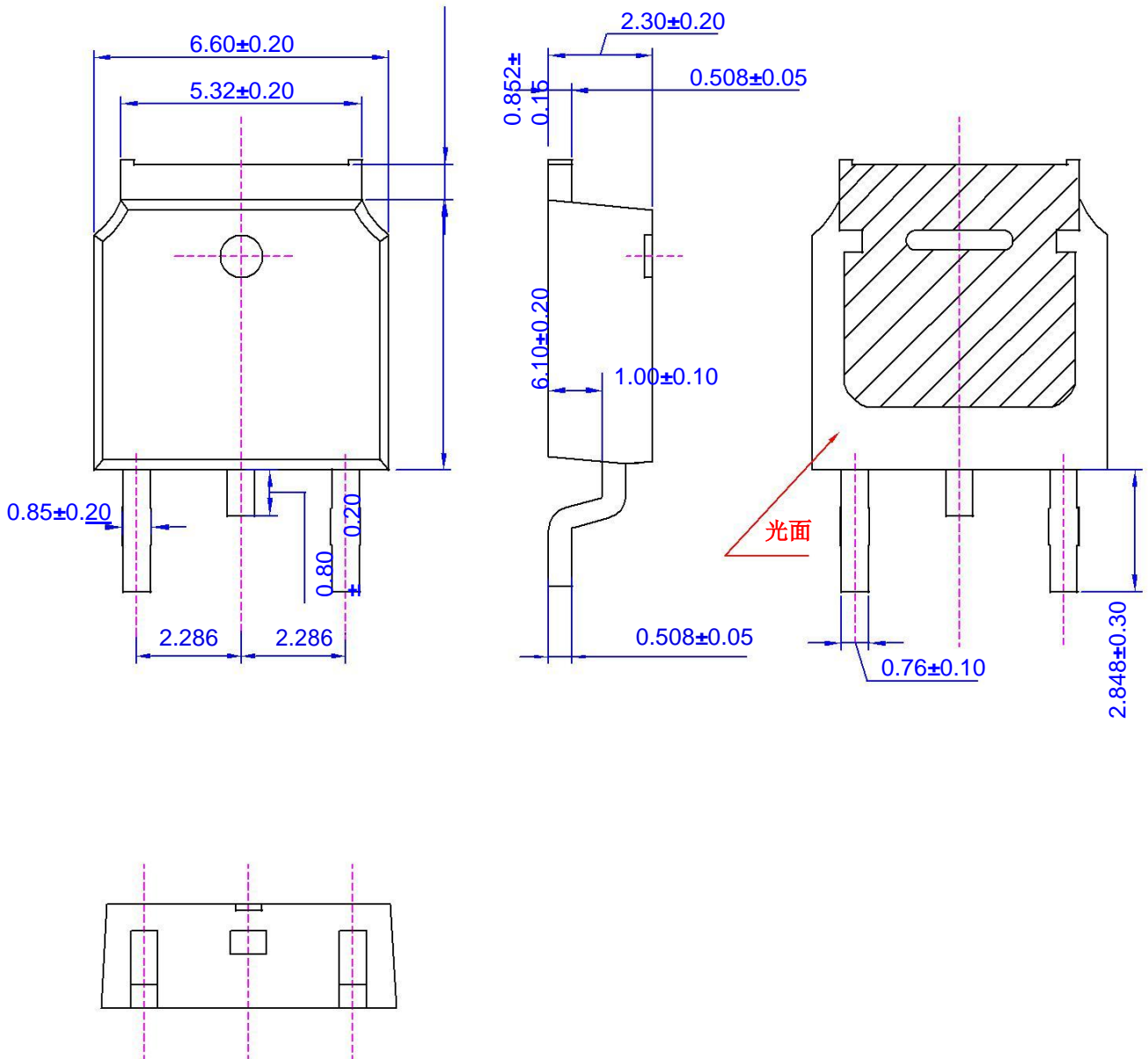


Figure 3: Unclamped Inductive Switching Test Circuit & Waveforms

**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  $\pm 0.15$ , 未标注圆角  $R_{max}=0.25$
3. 塑封体无缺损、缩孔、裂纹、气泡等不良缺陷
4. 标注单位 mm