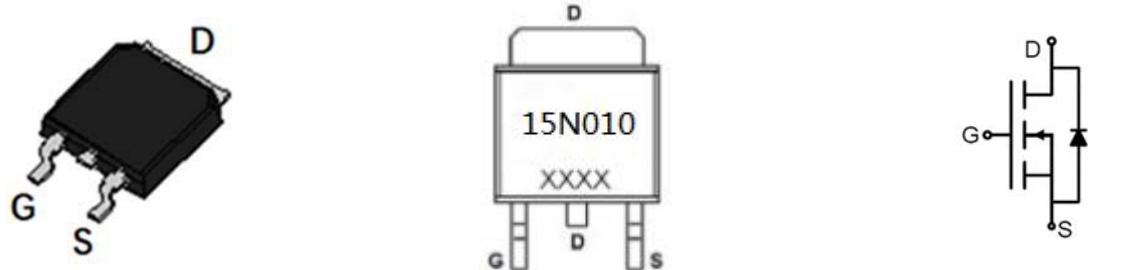




## Description

<p><b>Features</b></p> <ul style="list-style-type: none"> <li>• 100V,15A  <math>R_{DS(ON)} &lt; 150m\Omega @ V_{GS}=10V</math>  <math>R_{DS(ON)} &lt; 300m\Omega @ V_{GS}=4.5V</math></li> <li>• Advanced Split Gate Trench Technology</li> <li>• Excellent <math>R_{DS(ON)}</math> and Low Gate Charge</li> <li>• Lead free product is acquired</li> </ul>	<p><b>Application</b></p> <ul style="list-style-type: none"> <li>• Load Switch</li> <li>• PWM Application</li> <li>• Power management</li> </ul> <p style="text-align: center;"><i>100% UIS TESTED!</i> <i>100% <math>\Delta V_{ds}</math> TESTED!</i></p>
 <p>TO-252(DPAK) top view      Marking and pin Assignment      Schematic Diagram</p>	

## Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	Reel Size	Reel (PCS)	Per Carton (PCS)
15N010	15N010	TAPING	TO-252	13inch	2500	25000

## Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise specified)

Symbol	Parameter	Max.	Units
$V_{DSS}$	Drain-Source Voltage	100	V
$V_{GSS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current	$T_C = 25^\circ C$	15 A
		$T_C = 100^\circ C$	5.5 A
$I_{DM}$	Pulsed Drain Current <sup>note1</sup>	35	A
$E_{AS}$	Single Pulsed Avalanche Energy <sup>note2</sup>	1.25	mJ
$P_D$	Power Dissipation	$T_C = 25^\circ C$	25.4 W
$R_{\theta JC}$	Thermal Resistance, Junction to Case	4.25	$^\circ C/W$
$T_J, T_{STG}$	Operating and Storage Temperature Range	-55 to +150	$^\circ C$



### Electrical Characteristics (T<sub>J</sub>=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
<b>Off Characteristic</b>						
V <sub>(BR)DSS</sub>	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	100	-	-	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =100V, V <sub>GS</sub> =0V,	-	-	1.0	μA
I <sub>GSS</sub>	Gate to Body Leakage Current	V <sub>DS</sub> =0V, V <sub>GS</sub> =±20V	-	-	±100	nA
<b>On Characteristics</b>						
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	1.5	-	2.5	V
R <sub>DS(on)</sub>	Static Drain-Source on-Resistance <small>note3</small>	V <sub>GS</sub> =10V, I <sub>D</sub> =5A	-	124	150	mΩ
		V <sub>GS</sub> =4.5V, I <sub>D</sub> =3A	-	160	300	
<b>Dynamic Characteristics</b>						
C <sub>iss</sub>	Input Capacitance	V <sub>DS</sub> =50V, V <sub>GS</sub> =0V, f=100KHz	-	206	-	pF
C <sub>oss</sub>	Output Capacitance		-	29	-	pF
C <sub>rss</sub>	Reverse Transfer Capacitance		-	1.4	-	pF
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =50V, I <sub>D</sub> =5A, V <sub>GS</sub> =10V	-	4.3	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	1.5	-	nC
Q <sub>gd</sub>	Gate-Drain("Miller") Charge		-	1.1	-	nC
<b>Switching Characteristics</b>						
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =50V, I <sub>D</sub> =5A, R <sub>GEN</sub> =2Ω, V <sub>GS</sub> =10V	-	14.7	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	3.5	-	ns
t <sub>d(off)</sub>	Turn-off Delay Time		-	20.9	-	ns
t <sub>f</sub>	Turn-off Fall Time		-	2.7	-	ns
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Maximum Continuous Drain to Source Diode Forward Current		-	-	10	A
I <sub>SM</sub>	Maximum Pulsed Drain to Source Diode Forward Current		-	-	35	A
V <sub>SD</sub>	Drain to Source Diode Forward Voltage	V <sub>GS</sub> =0V, I <sub>S</sub> =10A	-	-	1.2	V
t <sub>rr</sub>	Body Diode Reverse Recovery Time	I <sub>F</sub> =5A, di/dt=100A/μs	-	32	-	ns
Q <sub>rr</sub>	Body Diode Reverse Recovery Charge		-	39	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T<sub>J</sub>=25°C, V<sub>DD</sub>=50V, V<sub>G</sub>=10V, R<sub>G</sub>=50Ω, L=0.5mH, I<sub>AS</sub>=3A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%



## Typical Performance Characteristics

Figure 1: Output Characteristics

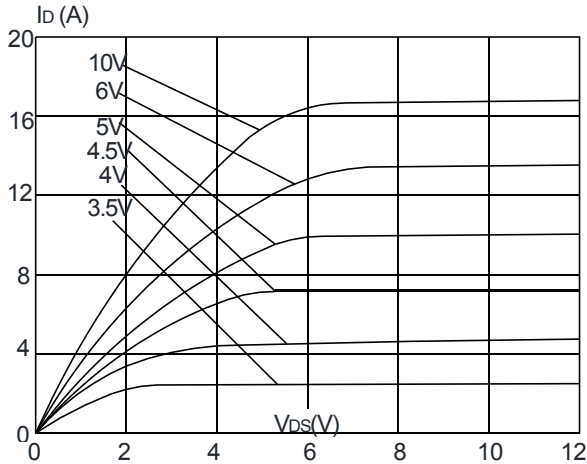


Figure 2: Typical Transfer Characteristics

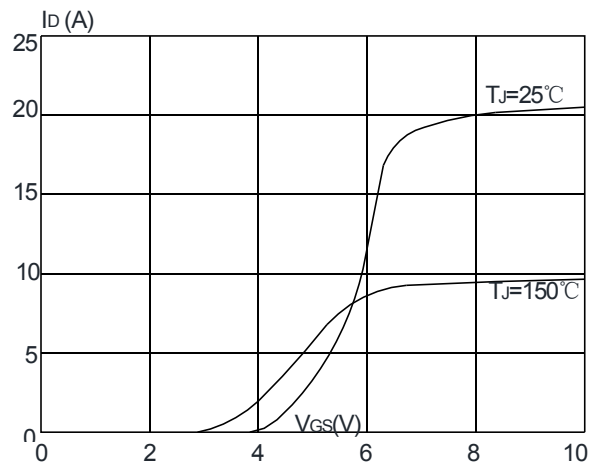


Figure 3: On-resistance vs. Drain Current

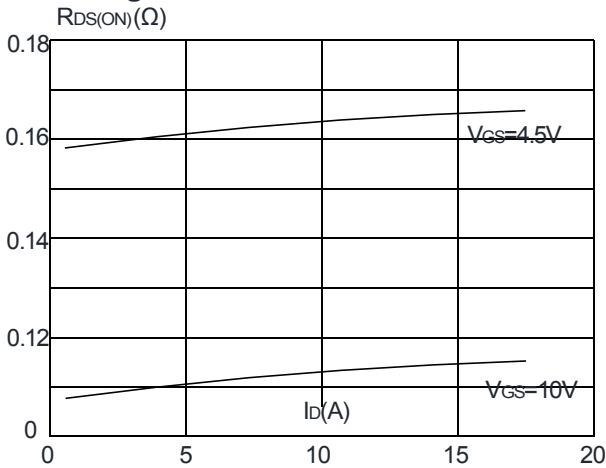


Figure 4: Body Diode Characteristics

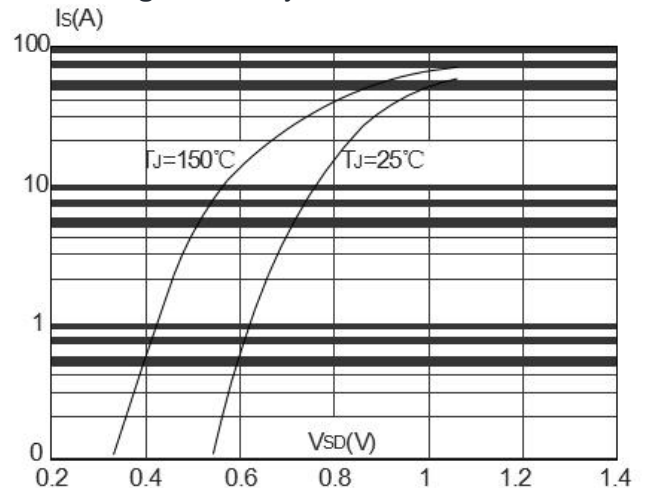


Figure 5: Gate Charge Characteristics

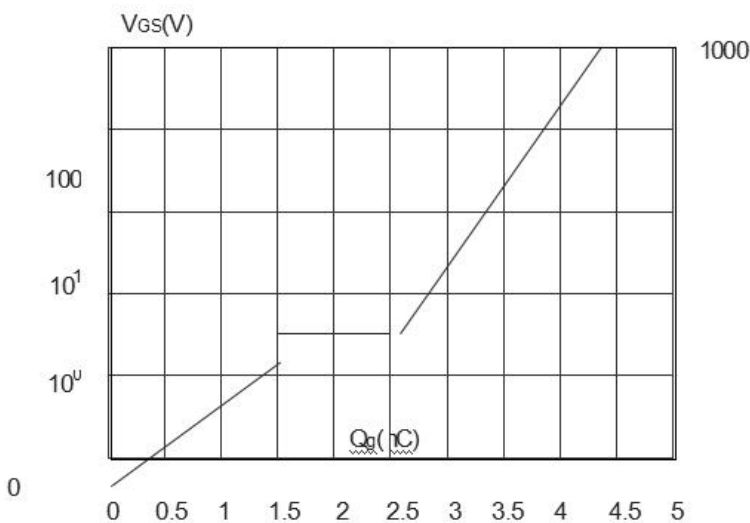
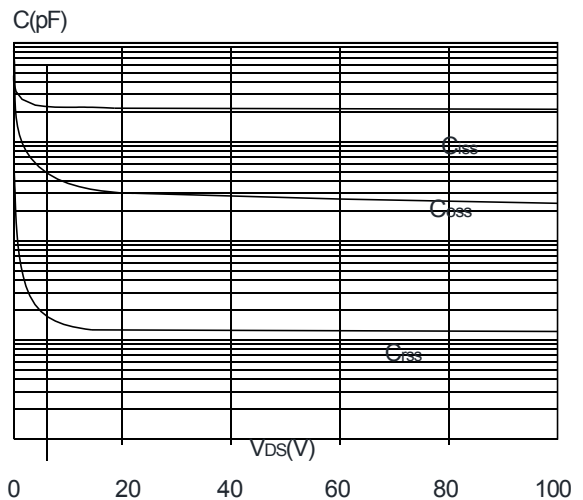
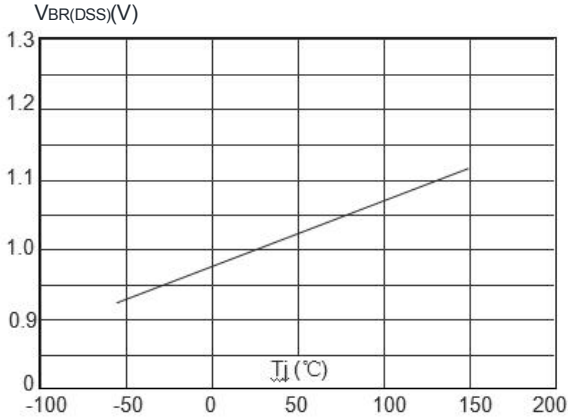


Figure 6: Capacitance Characteristics

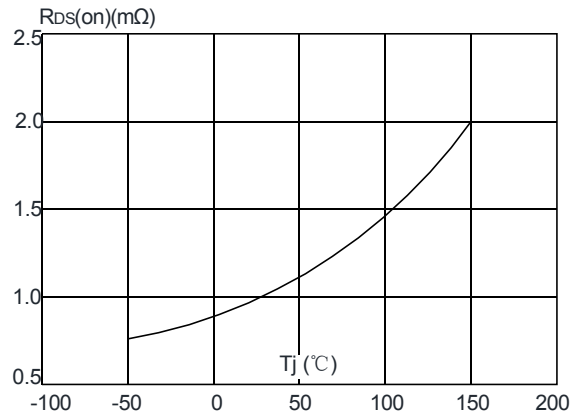




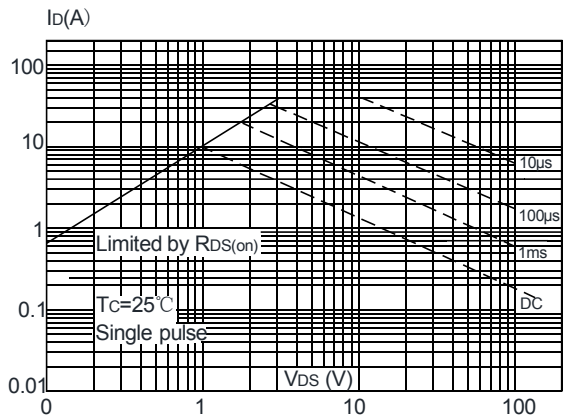
**Figure 7:** Normalized Breakdown Voltage vs. Junction Temperature



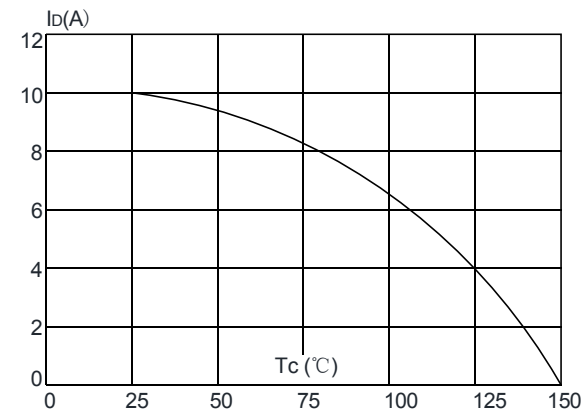
**Figure 8:** Normalized on Resistance vs. Junction Temperature



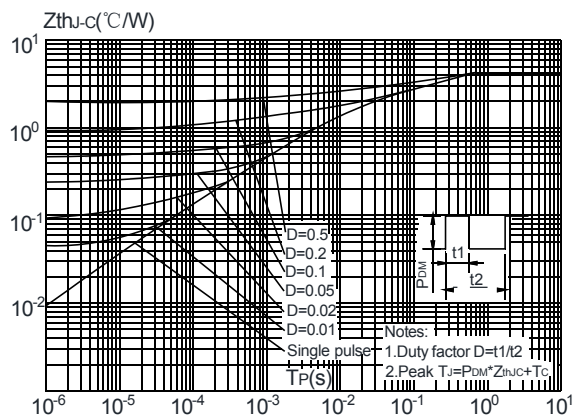
**Figure 9:** Maximum Safe Operating Area



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



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



### Test Circuit

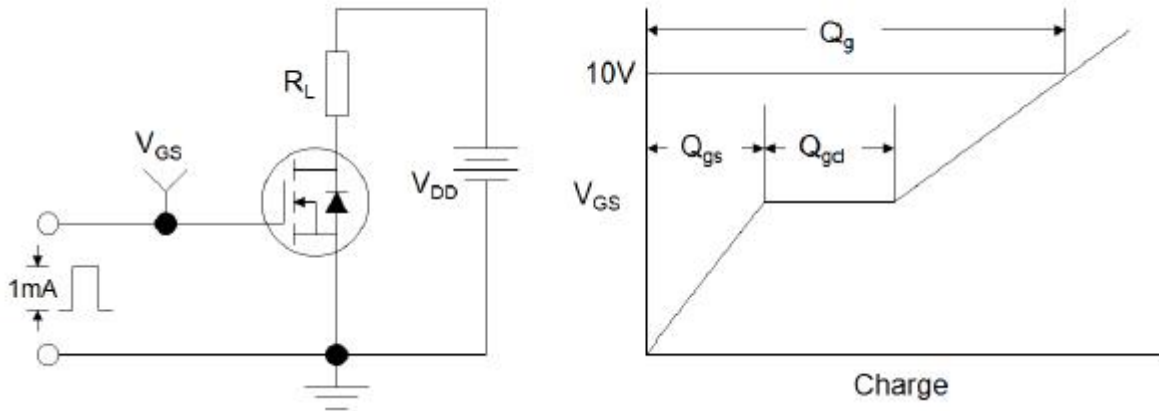


Figure1:Gate Charge Test Circuit & Waveform

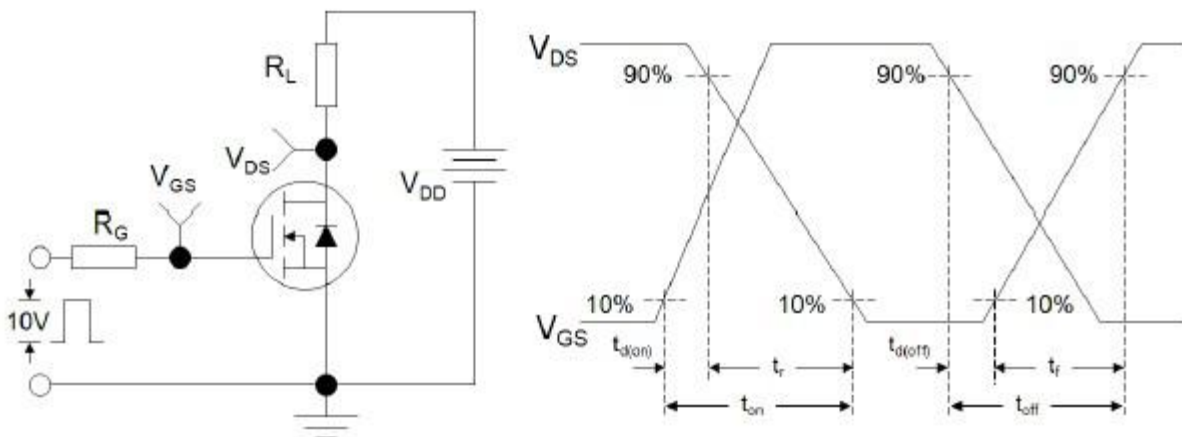


Figure 2: Resistive Switching Test Circuit & Waveforms

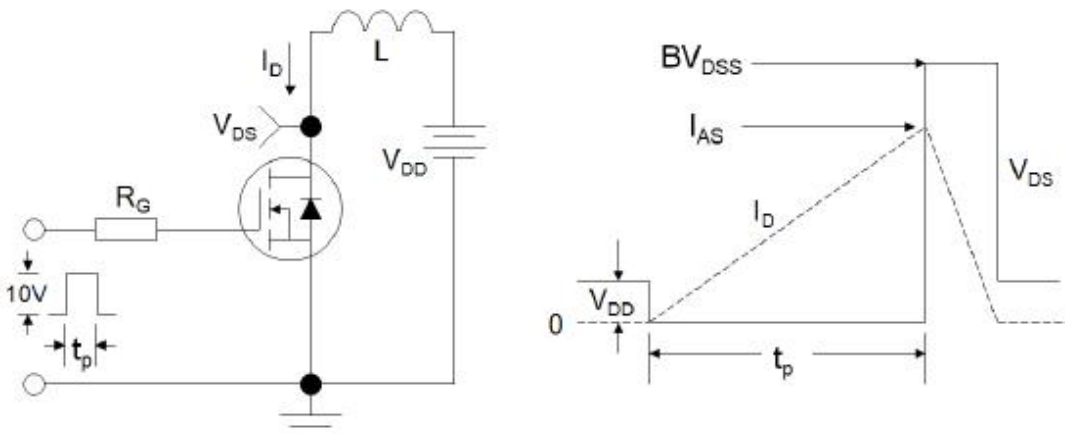
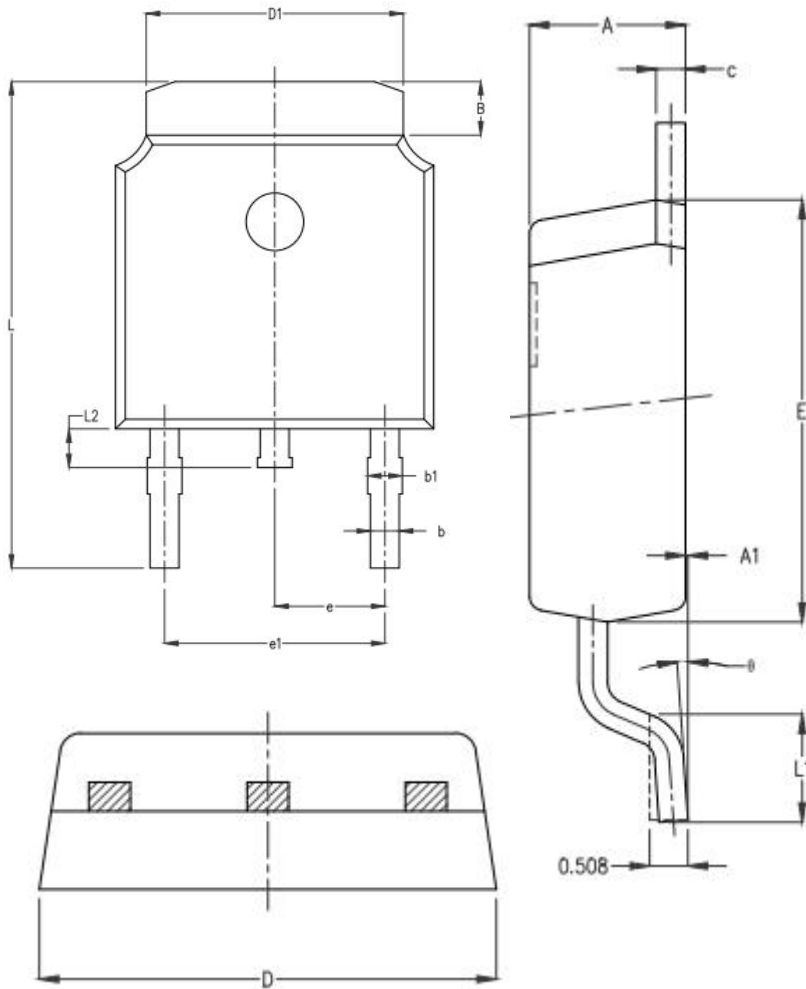


Figure 3:Unclamped Inductive Switching Test Circuit & Waveforms



### TO-252 Package Information



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	2.15	2.25	2.35
A1	0.00	0.06	0.12
B	0.96	1.11	1.26
b	0.59	0.69	0.79
b1	0.69	0.81	0.93
c	0.34	0.42	0.50
D	6.45	6.60	6.75
D1	5.23	5.33	5.43
E	5.95	6.10	6.25
e	2.286TYP.		
e1	4.47	4.57	4.67
L	9.90	10.10	10.30
L1	1.40	1.55	1.70
L2	0.60	0.80	1.00
θ	0°	4°	8°