

## N-Channel Enhancement Mode MOSFET

### 1. Product Information

#### 1.1 Features

- Advanced trench cell design
- Low thermal resistance
- Super trench

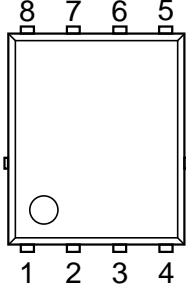
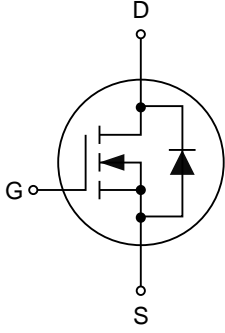
#### 1.2 Applications

- Motor drivers
- DC/DC converter

#### 1.3 Quick reference

- $BV \geq 30\text{ V}$
- $R_{DS(ON)} \leq 6\text{ m}\Omega @V_{GS} = 10\text{ V}$
- $P_{tot} \leq 35\text{ W}$
- $R_{DS(ON)} \leq 9\text{ m}\Omega @V_{GS} = 4.5\text{ V}$
- $I_D \leq 53\text{ A}$

### 2. Pin Description

Pin	Description	Simplified Outline	Symbol
1,2,3	Source	 <p style="text-align: center;">Top View PDFN5x6-8L</p>	
4	Gate		
5,6,7,8	Drain		

## 3. Limiting Values

Symbol	Parameter	Conditions	Min	Max	Unit
$V_{DS}$	Drain-Source Voltage	$T_C=25^{\circ}C$	-	30	V
$V_{GS}$	Gate-Source Voltage	$T_C=25^{\circ}C$	-	$\pm 20$	V
$I_D^*$	Drain Current	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	53	A
$I_{DM}^{*,**,***}$	Pulsed Drain Current	$T_C=25^{\circ}C, V_{GS}=10\text{ V}$	-	120	A
$P_{tot}^*$	Total Power Dissipation	$T_C=25^{\circ}C$	-	35	W
$I_S$	Diode Forward Current	$T_C=25^{\circ}C$	-	53	A
$E_{AS}^*$	Single Pulsed Avalanche Energy	$V_{DD}=30\text{ V}, L=1.0\text{ mH}$	-	78	mJ
$T_J, T_{stg}$	Operating Junction and Storage Temperature Range		-55	150	$^{\circ}C$
$R_{\theta JA}^*$	Thermal Resistance-Junction to Ambient		-	62.5	$^{\circ}C/W$
$R_{\theta JC}$	Thermal Resistance-Junction to Case		-	3.5	

Notes:

- \* Surface mounted on 1 in<sup>2</sup> pad area,  $t \leq 10$  sec.
- \*\* Pulse width  $\leq 300\ \mu s$ , duty cycle  $\leq 2\%$ .
- \*\*\* Limited by bonding wire.

## 4. Marking Information

Product Name	Marking
KJ0503G	<div style="display: flex; align-items: center;"> <div style="background-color: black; color: white; padding: 2px 5px; margin-right: 10px;">0503 YWWXXX</div> <div>YWWXXX: Date Code</div> </div>

## 5. Ordering Code

Product Name	Package	Reel size	Tape width	Quantity (pcs)
KJ0503G	PDFN 5x6-8L	13"	12 mm	5000

Note: KUAIJIEXIN defines "Green" as lead-free (RoHS compliant) and halogen free (Br or Cl does not exceed 900 ppm by weight in homogeneous material and total of Br and Cl does not exceed 1500 ppm by weight; Follow IEC 61249-2-21 and IPC/JEDEC J-STD-020C).

## 6. Electrical Characteristics (T<sub>A</sub>=25°C unless otherwise noted)

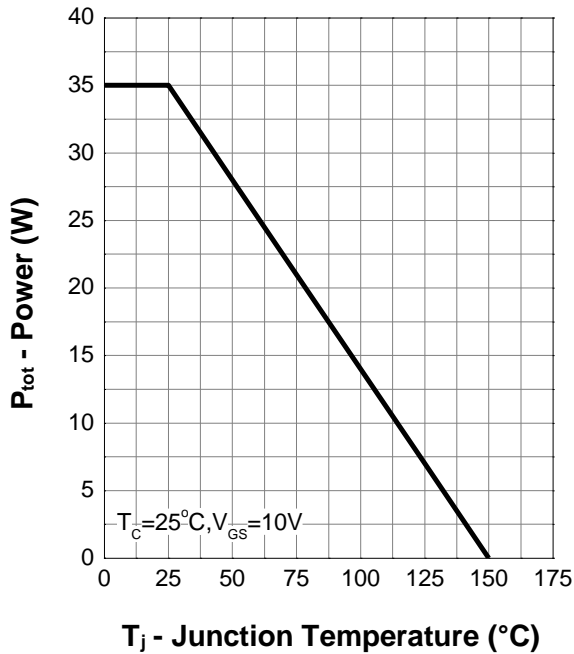
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
B <sub>V</sub> DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0 V, I <sub>D</sub> =250 μA	30	-	-	V
V <sub>GS(th)</sub>	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>DS</sub> =250 μA	1	-	2	V
I <sub>DSS</sub>	Zero Gate Voltage Drain Current	V <sub>DS</sub> =24 V, V <sub>GS</sub> =0 V T <sub>J</sub> =85°C	-	-	1	μA
			-	-	30	μA
I <sub>GSS</sub>	Gate Leakage Current	V <sub>GS</sub> =±20 V, V <sub>DS</sub> =0 V	-	-	±100	nA
R <sub>DS(ON)</sub> <sup>a</sup>	Drain-Source On-State Resistance	V <sub>GS</sub> =10 V, I <sub>D</sub> =20 A	-	5.2	6	mΩ
		V <sub>GS</sub> =4.5 V, I <sub>D</sub> =10 A	-	8.2	9	
<b>Diode Characteristics</b>						
V <sub>SD</sub> <sup>a</sup>	Diode Forward Voltage	I <sub>SD</sub> =20 A, V <sub>GS</sub> =0 V	-	-	1.3	V
t <sub>rr</sub>	Reverse Recovery Time	I <sub>SD</sub> =20 A, dI <sub>SD</sub> /dt=100 A/μs	-	23	-	ns
Q <sub>rr</sub>	Reverse Recovery Charge		-	10	-	nC
<b>Dynamic Characteristics<sup>b</sup></b>						
C <sub>iss</sub>	Input Capacitance	V <sub>GS</sub> =0 V, V <sub>DS</sub> =15 V, f=1MHz	-	765	-	pF
C <sub>oss</sub>	Output Capacitance		-	390	-	
C <sub>rss</sub>	Reverse Transfer Capacitance		-	40	-	
t <sub>d(on)</sub>	Turn-on Delay Time	V <sub>DS</sub> =15 V, V <sub>GEN</sub> =10 V, R <sub>G</sub> =4.5 Ω, R <sub>L</sub> =0.75 Ω, I <sub>DS</sub> =20 A	-	7.5	-	ns
t <sub>r</sub>	Turn-on Rise Time		-	57	-	
t <sub>d(off)</sub>	Turn-off Delay Time		-	13	-	
t <sub>f</sub>	Turn-off Fall Time		-	21	-	
<b>Gate Charge Characteristics<sup>b</sup></b>						
Q <sub>g</sub>	Total Gate Charge	V <sub>DS</sub> =15 V, V <sub>GS</sub> =10 V, I <sub>DS</sub> =20 A	-	14	-	nC
Q <sub>gs</sub>	Gate-Source Charge		-	3.3	-	
Q <sub>gd</sub>	Gate-Drain Charge		-	2.3	-	

Notes:

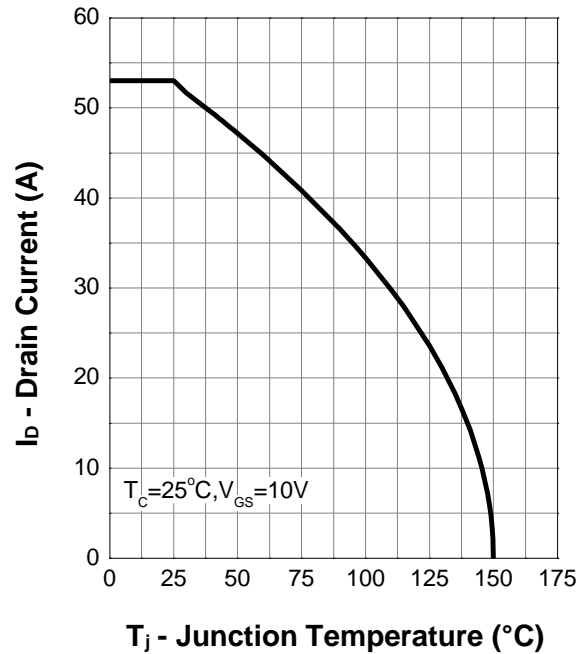
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.

## 7. Typical Characteristics

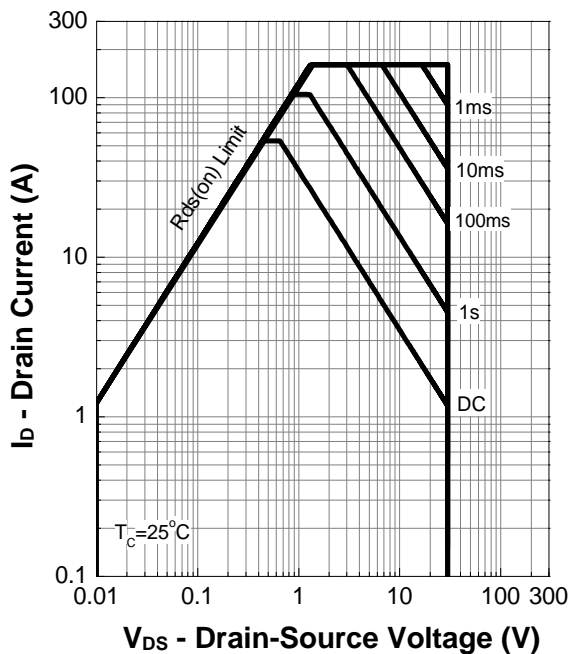
**Power Capability**



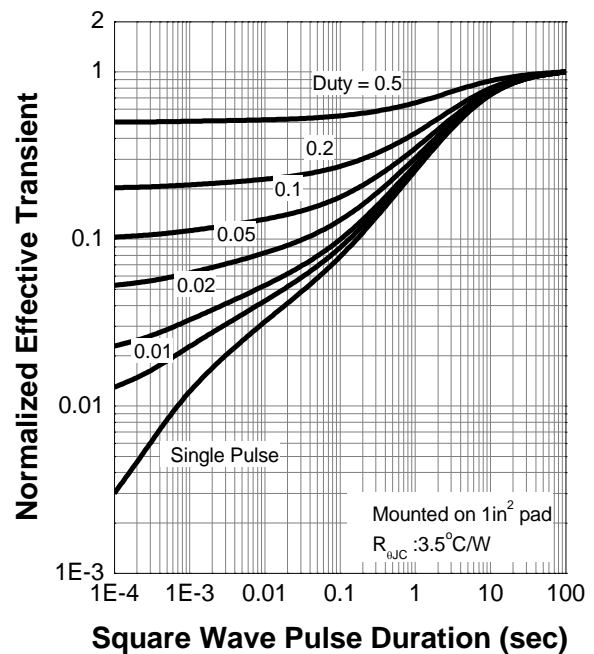
**Current Capability**



**Safe Operation Area**

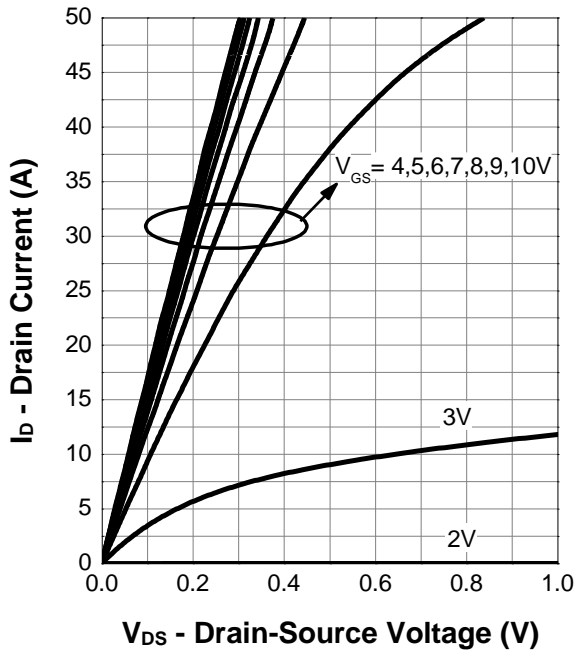


**Transient Thermal Impedance**

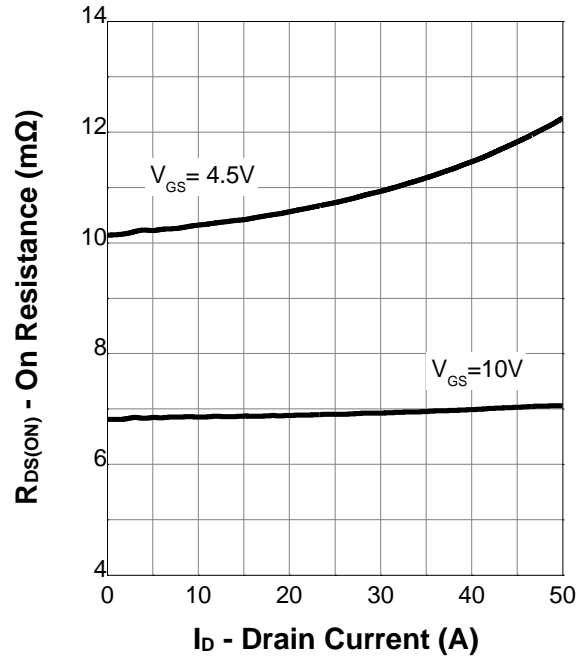


## 7. Typical Characteristics (cont.)

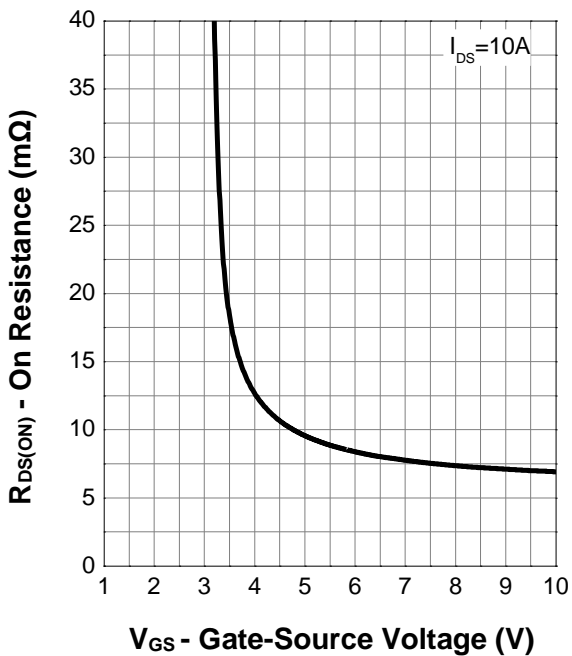
Output Characteristics



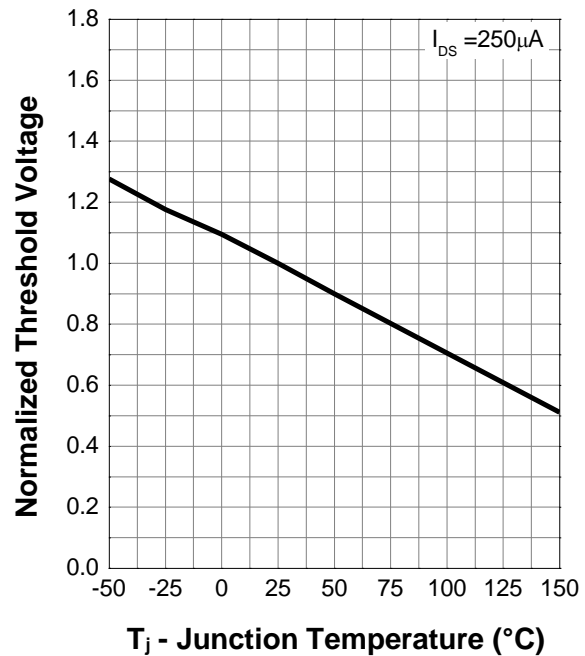
On Resistance



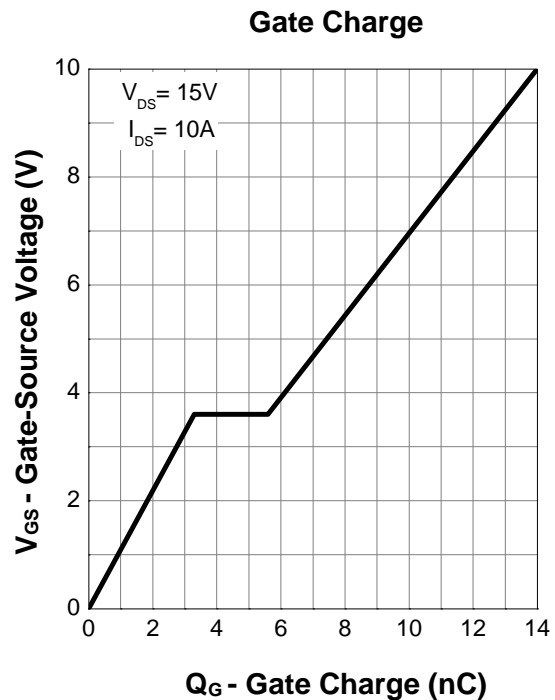
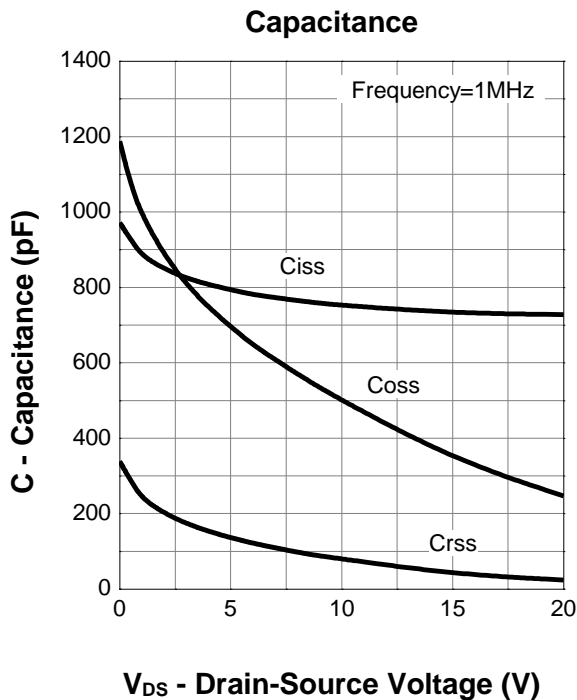
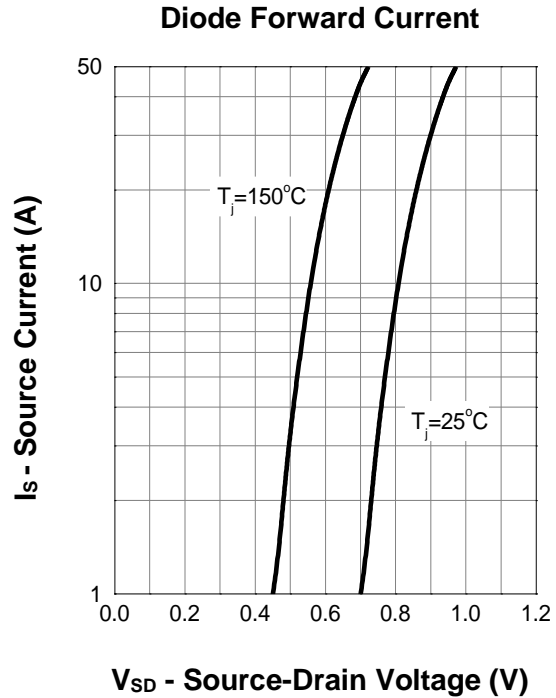
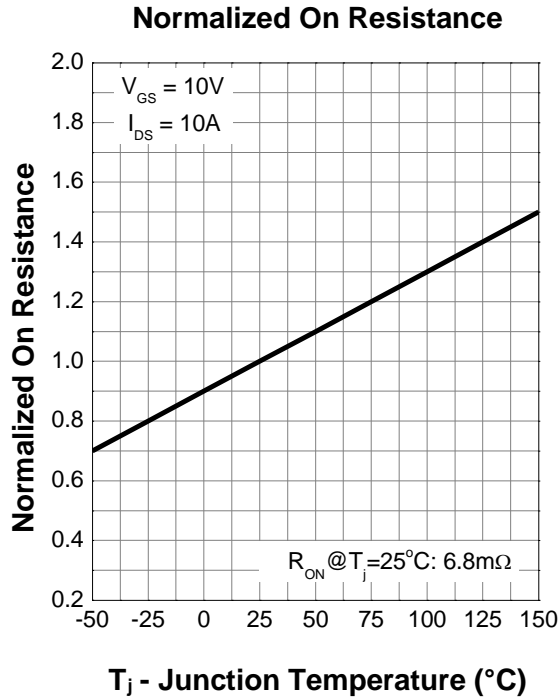
Transfer Characteristics



Normalized Threshold Voltage

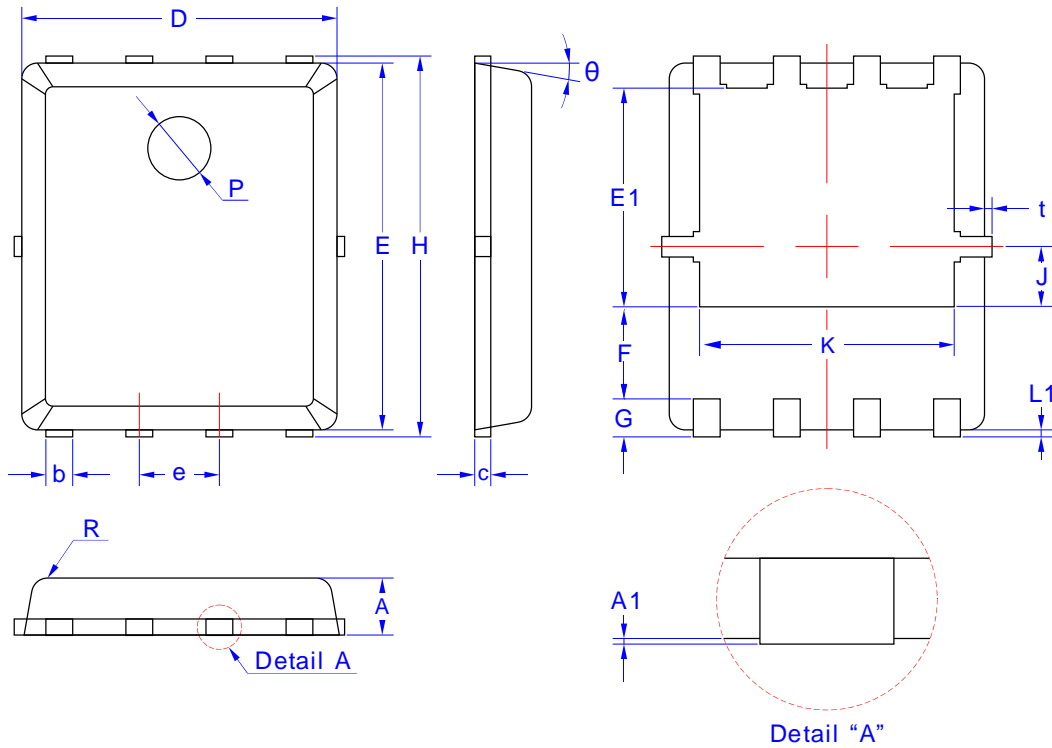


## 7. Typical Characteristics (cont.)



## 8. Package Dimensions

PDFN 5x6-8L Package



Symbol	Dimensions in Millimeters	
	MIN	MAX
A	0.80	1.00
A1	0.00	0.05
b	0.35	0.49
c	0.254 REF	
D	4.90	5.10
E	5.70	5.90
E1	3.40 REF	
e	1.27 BSC	
F	1.40 REF	
G	0.60 REF	
H	5.95	6.20
J	0.95 BSC	
K	4.00 REF	
L1	0.10	0.18
L	-	0.15
P	1.00 REF	
R	0.25 REF	
θ	6°	14°