PE2317T P-Channel Enhancement Mode Power MOSFET

PE2317T Description

The PE2317T uses advanced trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. It can be used in a wide variety of applications.

PE2317T General Features

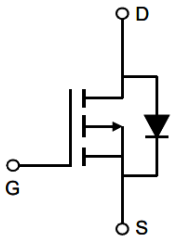
- V_{DS} = -20V, I_D = -7A

  $R_{DS(ON)}$ < 28mΩ @ V_{GS}=-4.5V
  $R_{DS(ON)}$ < 35mΩ @ V_{GS}=-3V
  $R_{DS(ON)}$ < 38mΩ @ V_{GS}=-2.5V

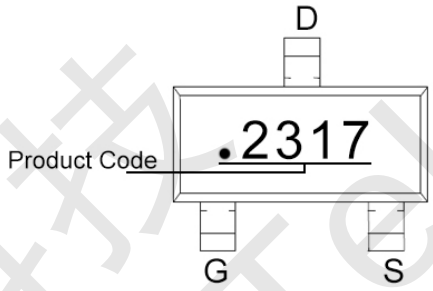
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

PE2317T Application

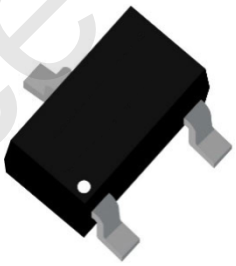
- PWM applications
- Load switch
- Power management



Schematic diagram



Marking and pin assignment



SOT-23-3L

PE2317T Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	±12	V
Drain Current-Continuous	I_D	-7	A
Pulsed Drain Current (Note 1)	I_{DM}	-24	A
Maximum Power Dissipation	P_D	1.5	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

PE2317T Thermal Characteristic

Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	83	℃/W

PE2317T Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{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	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.45	-0.7	-1	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V,I_D=-6A	-	22	28	mΩ
		V_{GS}=-3V,I_D=-5A	-	27	35	mΩ
		V_{GS}=-2.5V,I_D=-5A	-	29	38	mΩ
Dynamic Characteristics (Note 4)						
Input Capacitance	C_{iss}	V_{DS}=-10V, VGS=0V, F=1.0MHz	-	990	-	pF
Output Capacitance	C_{oss}		-	120	-	pF
Reverse Transfer Capacitance (Note 4)	C_{rss}		-	100	-	pF
Gate Resistance	R_g			10		Ω
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-10V, RL=1Ω, V_{GS}=-4.5V,R_G=3Ω	-	14.2	-	nS
Turn-on Rise Time	t_r		-	7.6	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	38	-	nS
Turn-Off Fall Time	t_f		-	13.8	-	nS
Total Gate Charge	Q_g	V_{DS}=-10V, I_D=-6A, V_{GS}=-4.5V	-	8.4	-	nC
Gate-Source Charge	Q_{gs}		-	2.6	-	nC
Gate-Drain Charge	Q_{gd}		-	1.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-7	A
Body Diode Reverse Recovery Time	t_{rr}	I_F=-6A, di/dt=100A/us	-	28.1	-	nS
Body Diode Reverse Recovery Charge	Q_{rr}		-	7.9	-	nC

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t ≤ 10 sec.
3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to product.

PE2317T Typical Electrical and Thermal Characteristics

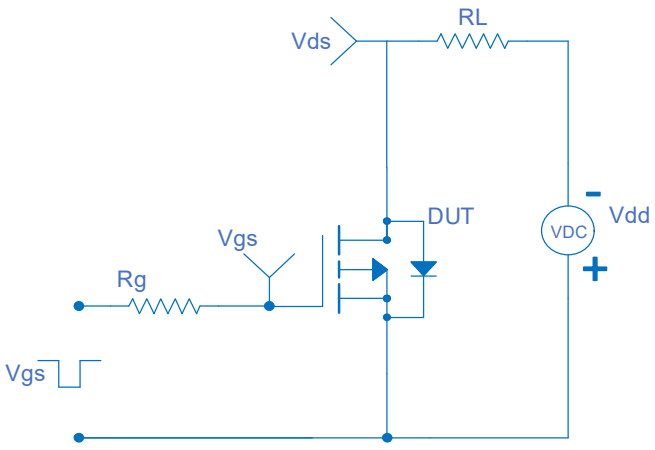


Figure 1 Switching Test Circuit

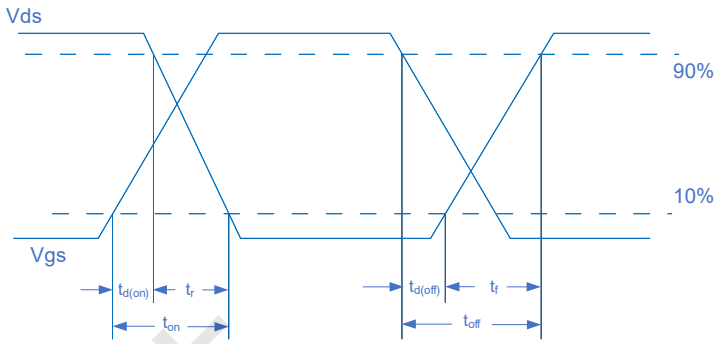


Figure 2 Switching Waveform

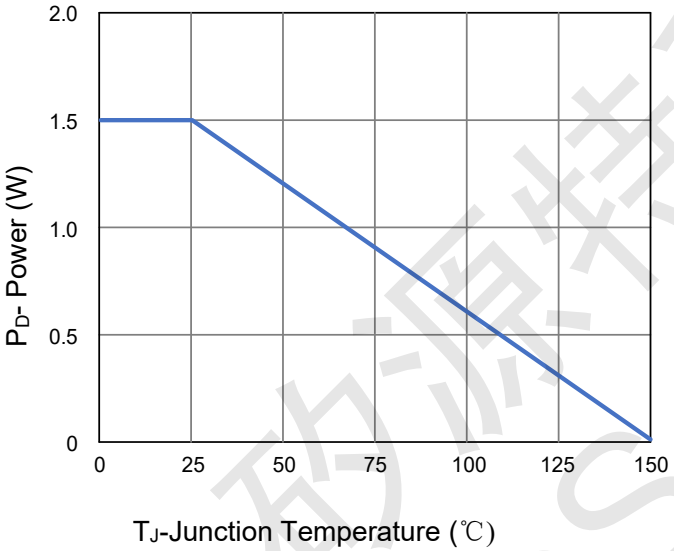


Figure 3 Power De-rating

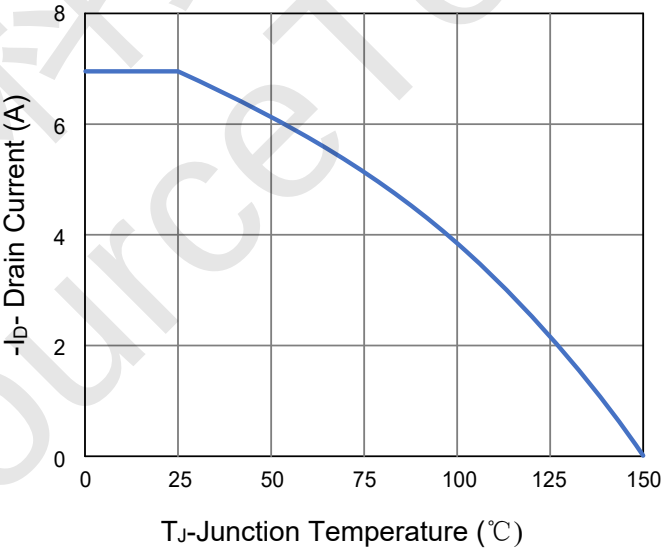


Figure 4 Drain Current

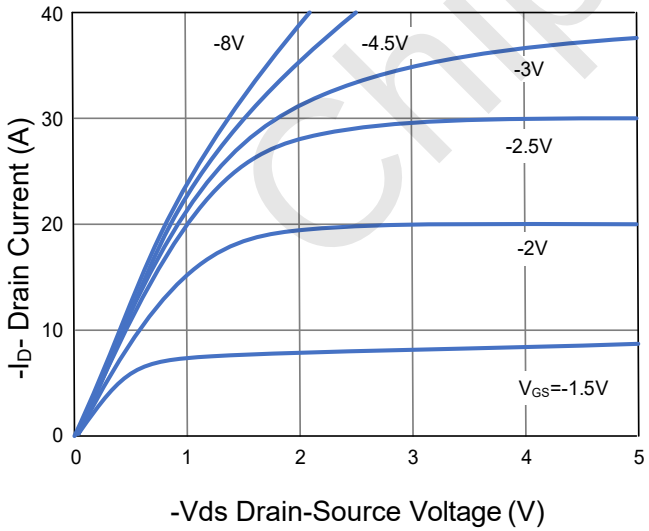


Figure 5 Output Characteristics

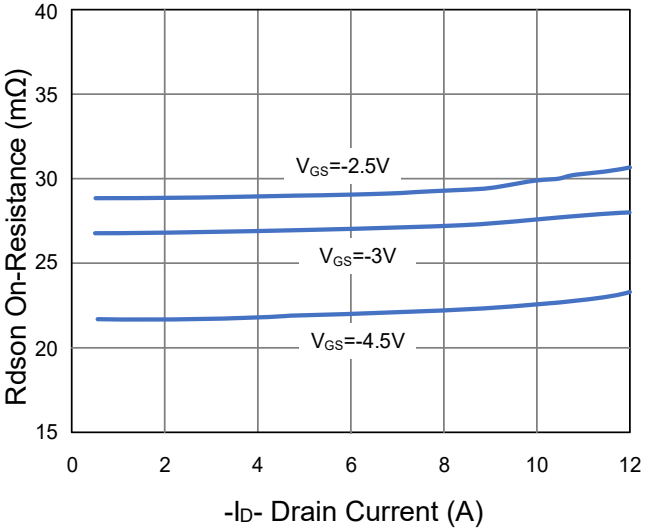


Figure 6 Rdson vs Drain Current

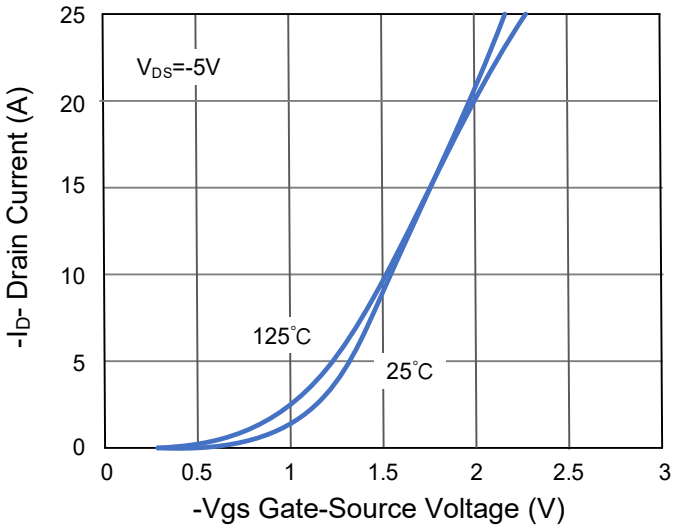


Figure 7 Transfer Characteristics

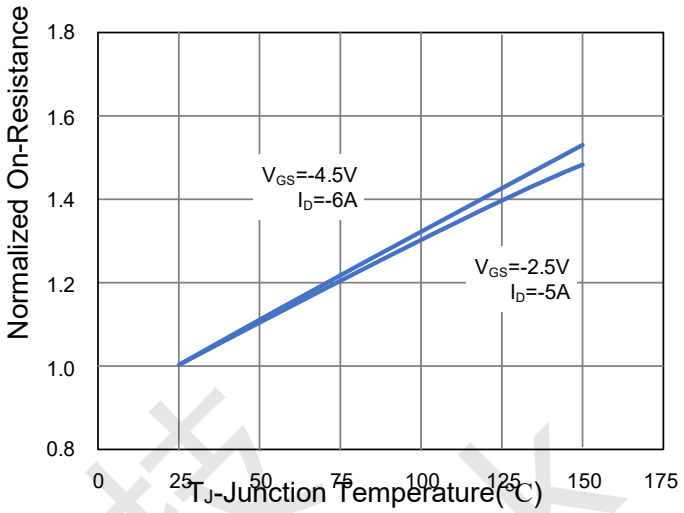


Figure 8 Rdson vs Junction Temperature

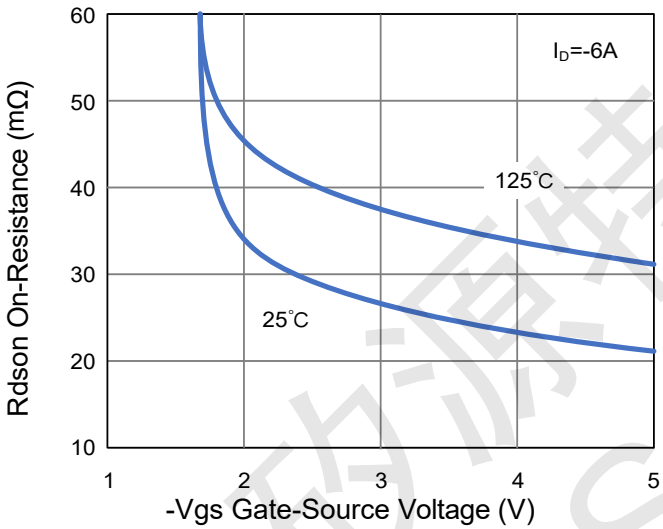


Figure 9 Rdson vs Vgs

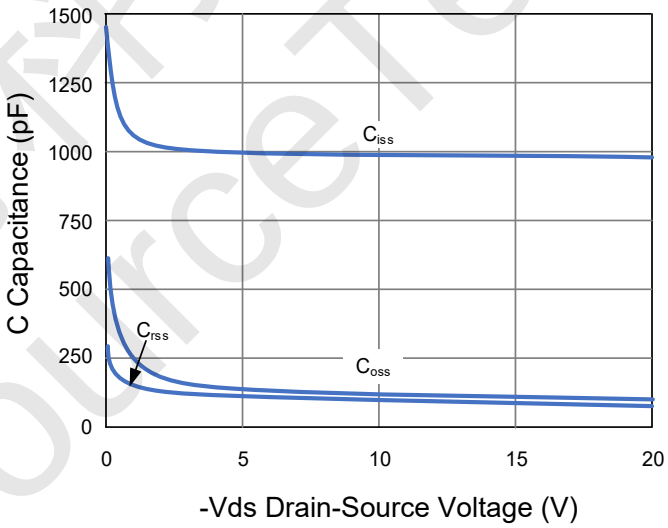


Figure 10 Capacitance vs Vds

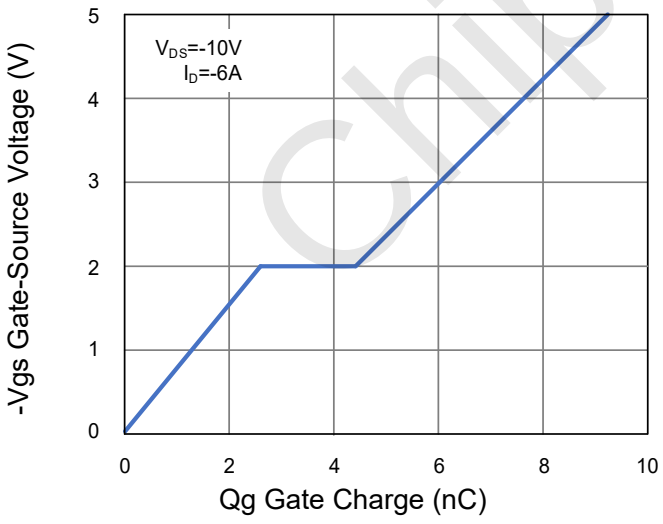


Figure 11 Gate Charge

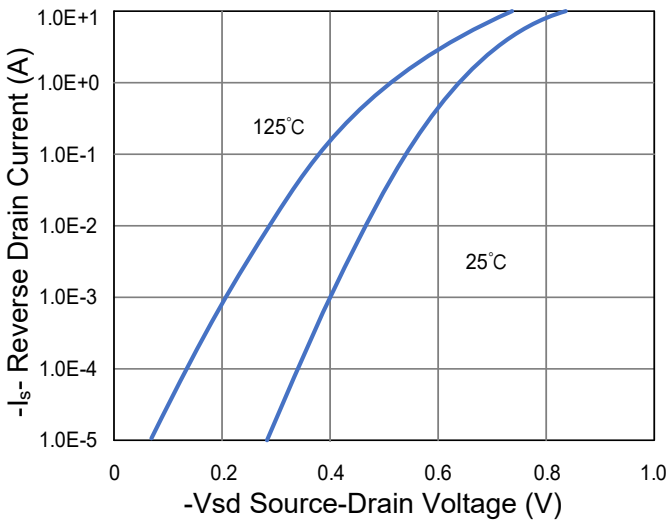


Figure 12 Source- Drain Diode Forward

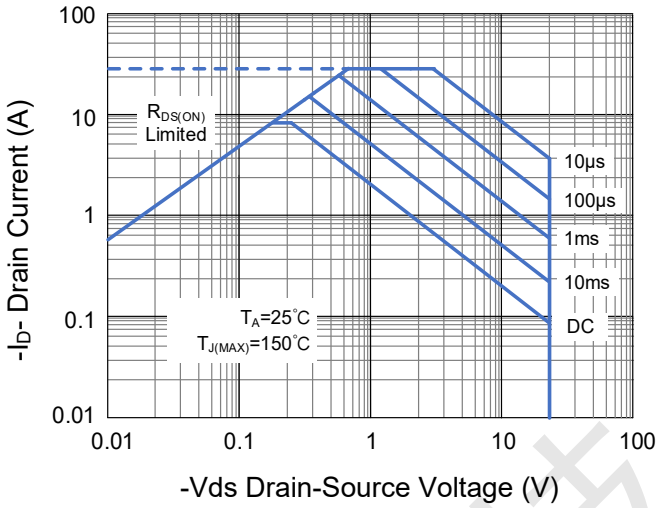


Figure 13 Safe Operation Area

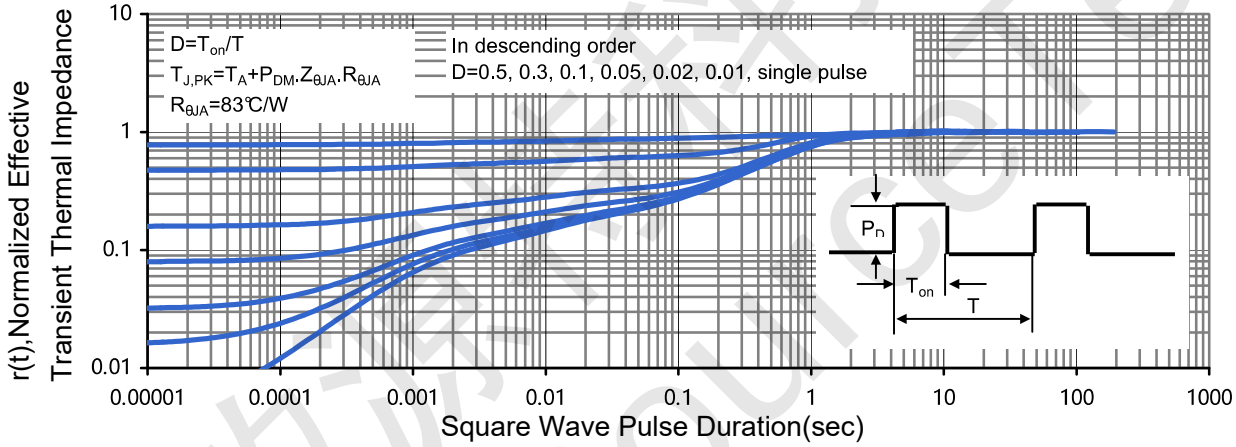
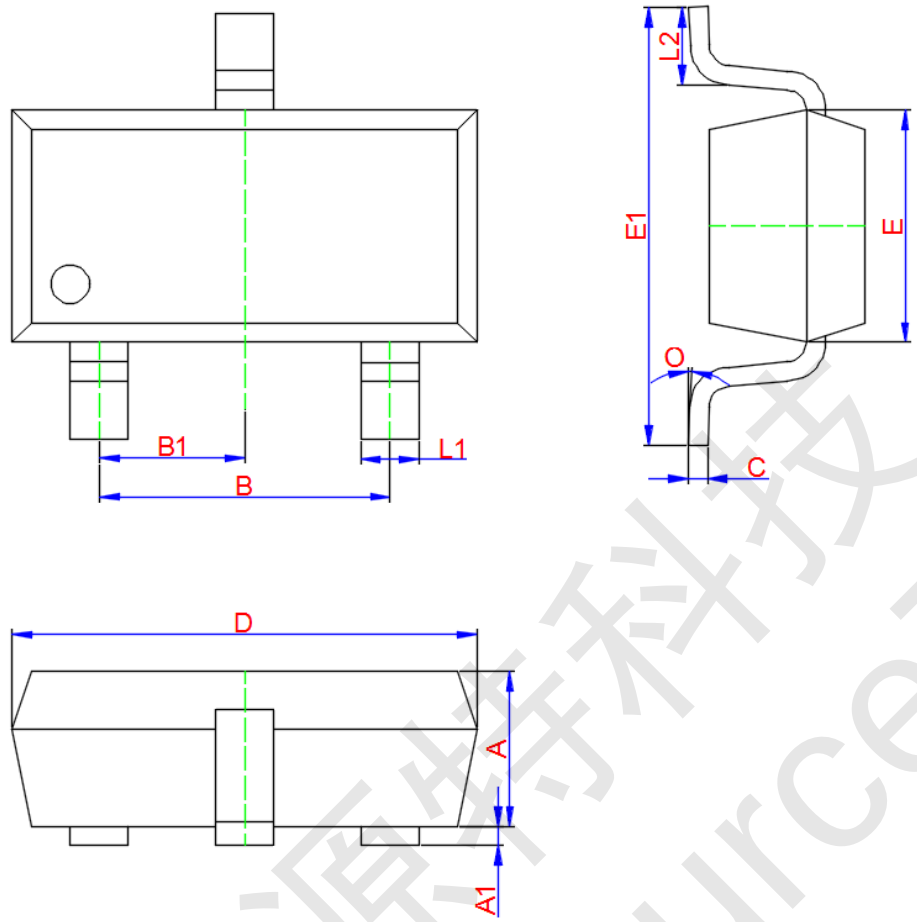


Figure 14 Normalized Maximum Transient Thermal Impedance

PE2317T SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	1.050	1.100	1.150
A1	0.000	0.050	0.100
L1	0.300	0.400	0.500
C	0.100	0.150	0.200
D	2.820	2.920	3.020
E	1.500	1.600	1.700
E1	2.650	2.800	2.950
B	1.800	1.900	2.000
B1	0.950 TYP.		
L2	0.300	0.450	0.600
O	0°	4°	8°