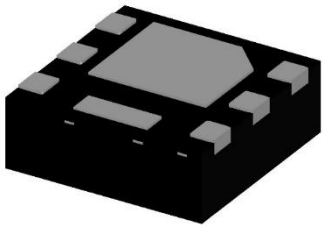
WNM3056

Single N-Channel, 30V, 11.6A, Power MOSFET

http://www.omnivision-group.com

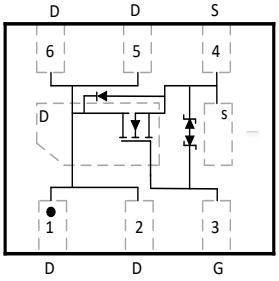
V_{DS} (V)	Max $R_{DS(on)}$ (mΩ)
30	14@V_{GS}=4.5V
	15@V_{GS}=3.7V
	20@V_{GS}=2.5V
	24@V_{GS}=1.8V
ESD Rating:2000V HBM	



DFN2X2-6L

Description

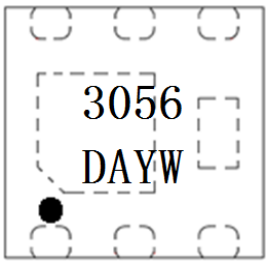
The WNM3056 is Single N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WNM3056 is Pb-free.



Pin configuration (Top view)

Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package DFN2X2-6L



3056 = Device Code
DA = Special Code
Y = Year
W = Week(A~Z)

Marking

Applications

- DC/DC converters
- Power supply converters circuit
- Load/Power Switching for portable device

Order information

Device	Package	Shipping
WNM3056-6/TR	DFN2x2-6L	3000/Tape&Reel

Absolute Maximum ratings

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±10	
Continuous Drain Current	T_A=25°C	I_D	11.6	A
	T_A=70°C		9.3	
Pulsed Drain Current [c]		I_{DM}	35	
Power Dissipation [b]	T_A=25°C	P_D	3.4	W
	T_A=70°C		2.2	
Operating Junction Temperature		T_J	-55 to 150	°C
Storage Temperature Range		T_{STG}	-55 to 150	°C

Thermal resistance ratings

Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance [a]	t ≤ 10 s	$R_{\theta JA}$	30	37	°C/W
	Steady State		56	67	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	5.5	6.5	

Note:

a. FR-4 board (38mm X 38mm X t1.6mm, 70um Copper) partially covered with copper (645mm^2 area)

b. The power dissipation P_D is based on Junction-to-Ambient thermal resistance $R_{\theta JA}$ t≤10s value and the $T_{J(MAX)}$=150°C.

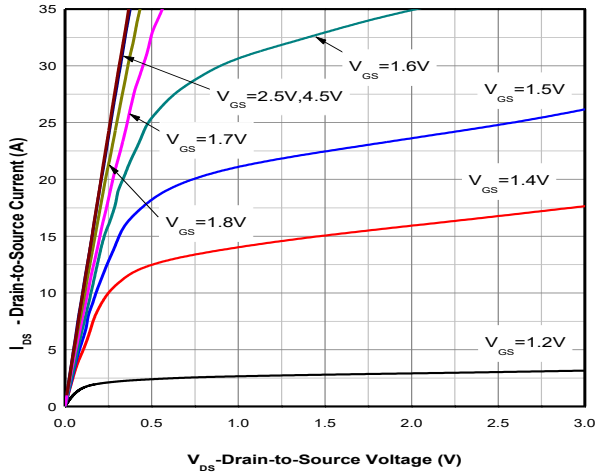
c. Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial T_J =25°C, the maximum allowed junction temperature of 150°C.

d. The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

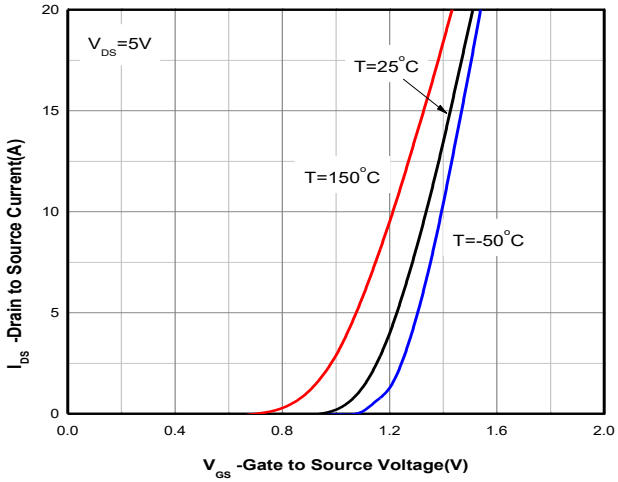
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250uA	30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} =30V, V_{GS} = 0V			1	uA
Gate-to-source Leakage Current	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±10V			±10	uA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	V_{GS} = V_{DS}, I_D = 250uA	0.45	0.75	1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	V_{GS} = 4.5V, I_D = 8.0A		10.8	14	mΩ
		V_{GS} = 3.7V, I_D = 8.0A		11	15	
		V_{GS} = 2.5V, I_D = 7.2A		12	20	
		V_{GS} = 1.8V, I_D = 3.7A		13.5	24	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	V_{GS}=0V,F=1MHz, V_{DS}=15V		1786		pF
Output Capacitance	C_{OSS}			151		
Reverse Transfer Capacitance	C_{RSS}			114		
Total Gate Charge	$Q_{G(TOT)}$	V_{GS}=4.5V,V_{DS}=15 V, I_D =8A		20		nC
Threshold Gate Charge	$Q_{G(TH)}$			1.5		
Gate-to-Source Charge	Q_{GS}			2.6		
Gate-to-Drain Charge	Q_{GD}			4.4		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	td(ON)	V_{GS} = 4.5V,V_{DS}= 15 V, I_D =8A, R_G=6Ω		14		ns
Rise Time	tr			54		
Turn-Off Delay Time	td(OFF)			80		
Fall Time	tf			65		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 1A		0.7	1.2	V

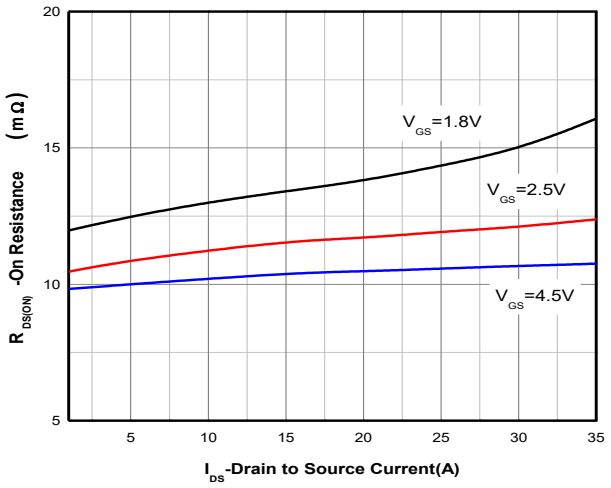
Typical Characteristics (Ta=25°C, unless otherwise noted)



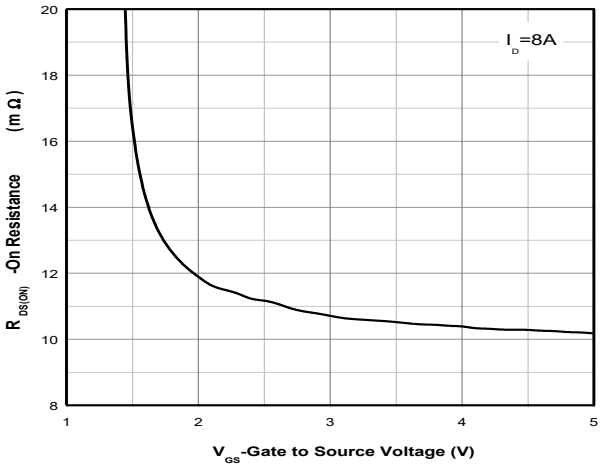
Output characteristics [d]



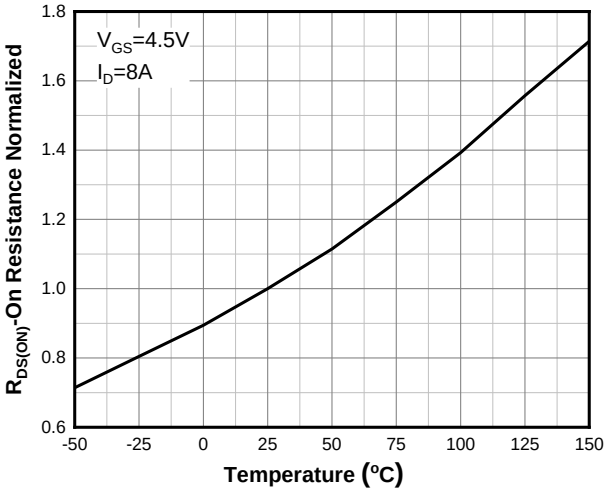
Transfer Characteristics [d]



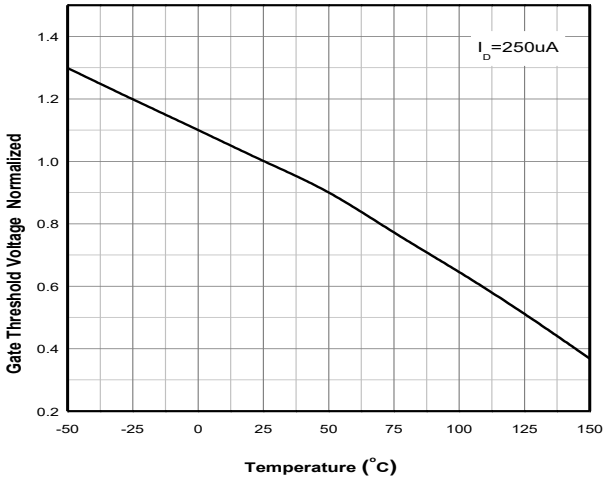
On-Resistance vs. Drain current [d]



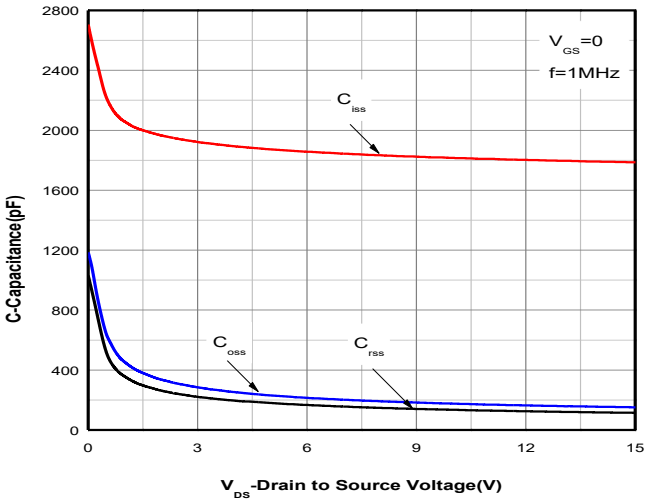
On-Resistance vs. Gate-to-Source Voltage [d]



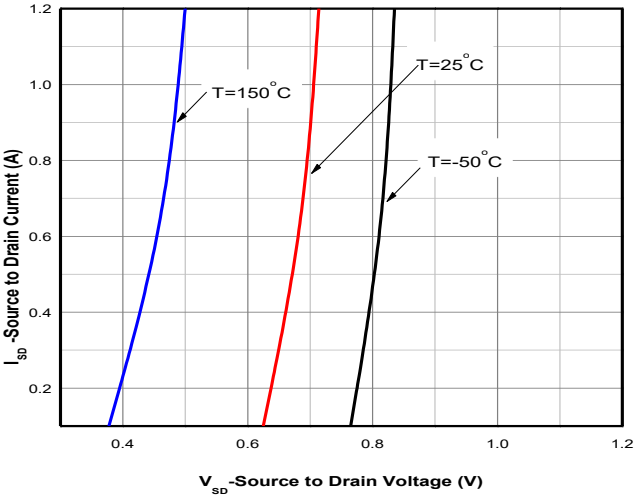
On-Resistance vs. Junction Temperature [d]



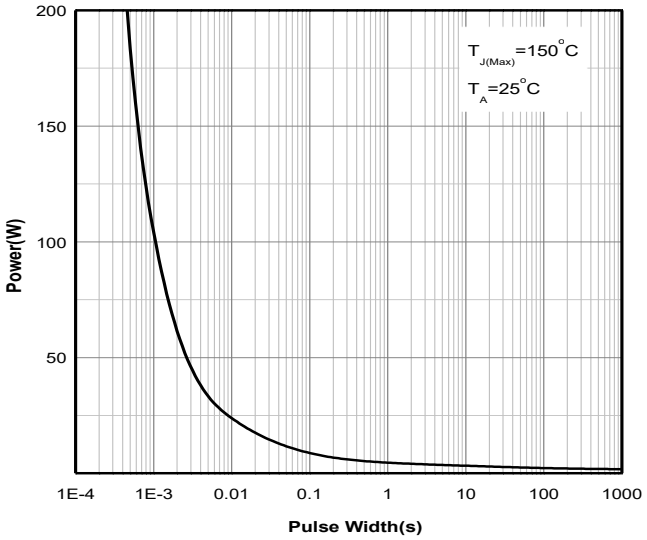
Threshold Voltage vs. Temperature



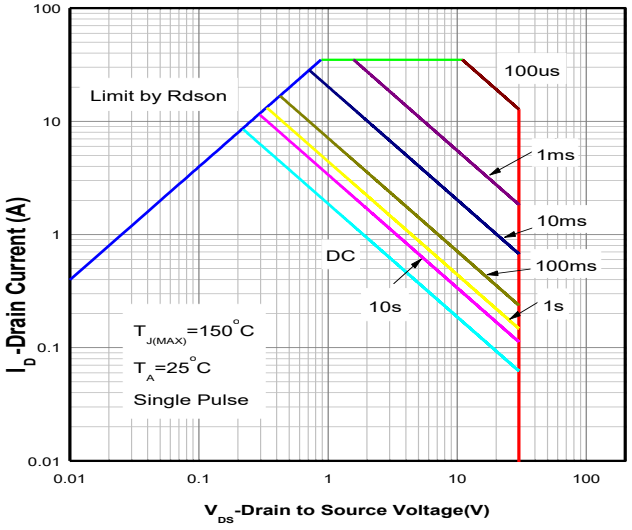
Capacitance



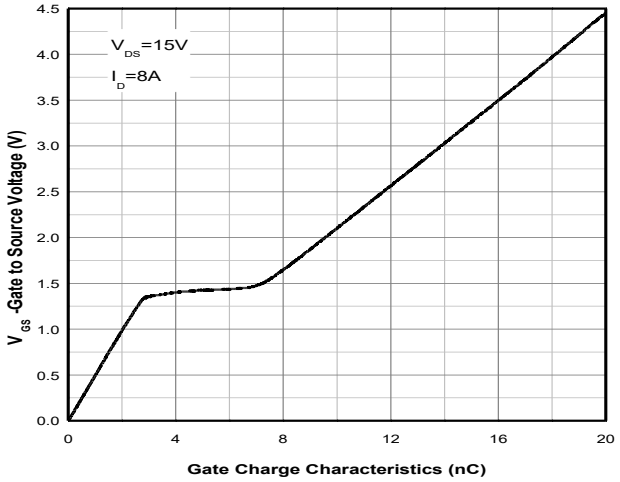
Body Diode Forward Voltage [d]



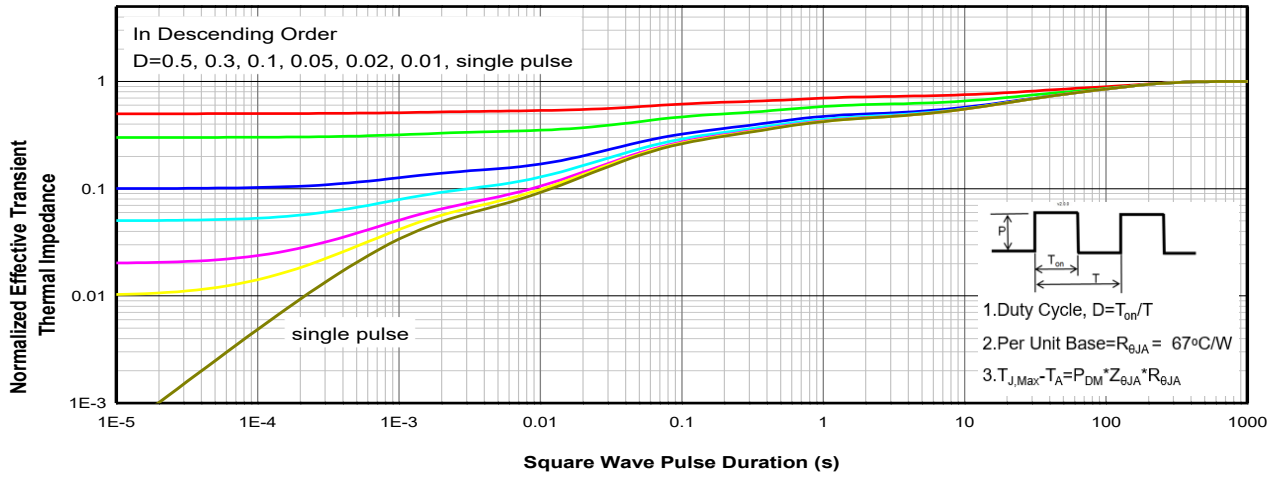
Single pulse power



Safe operating power



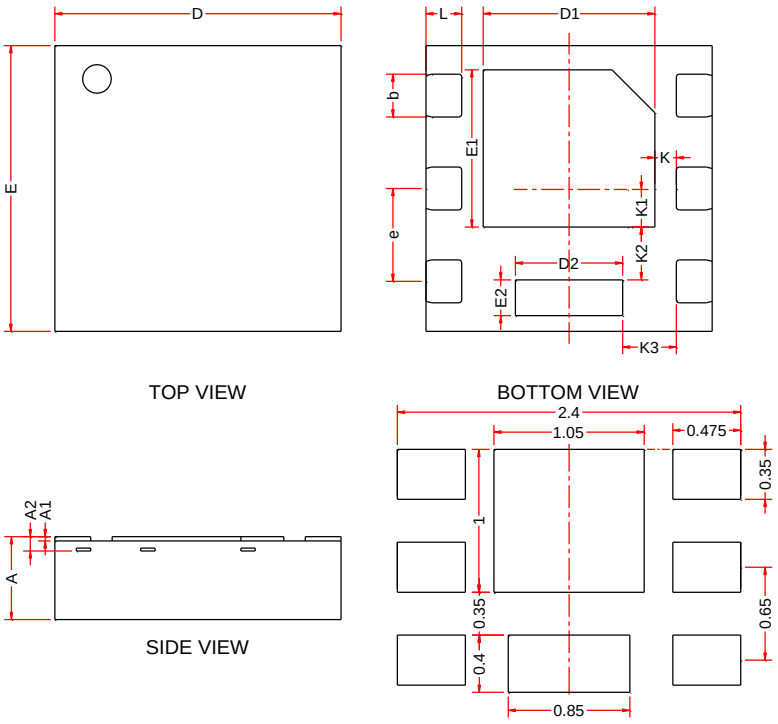
Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

PACKAGE OUTLINE DIMENSIONS

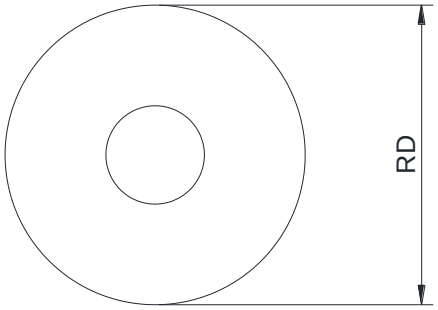
DFN2x2-6L



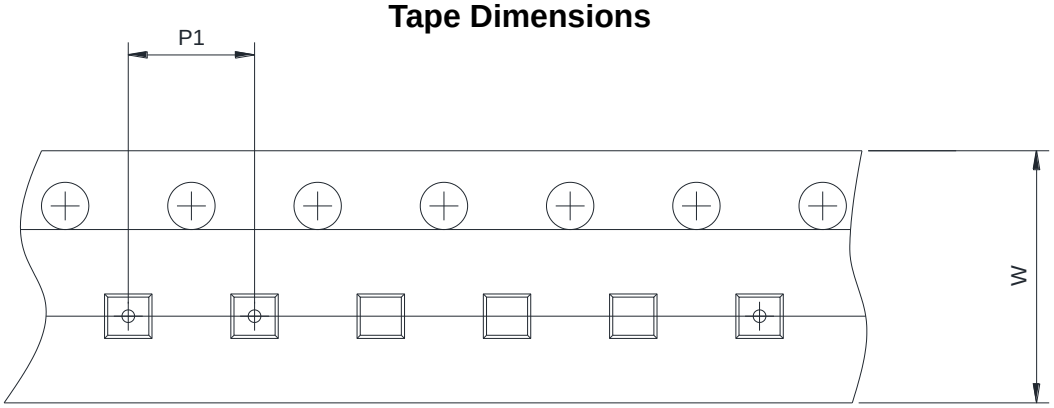
Symbol	Dimensions in Millimeters		
	Min.	Nom	Max.
A	0.50	---	0.65
A1	0.00	0.02	0.05
A2		0.10REF	
b	0.25	0.30	0.35
D	1.90	2.00	2.10
D1	1.10	1.20	1.30
D2	0.65	0.75	0.85
E	1.90	2.00	2.10
E1	1.00	1.10	1.20
E2	0.15	0.25	0.35
e		0.65BSC	
L	0.20	0.25	0.30
K	0.05	0.15	0.25
K1	0.17	0.27	0.37
K2	0.27	0.37	0.47
K3	0.28	0.38	0.48

TAPE AND REEL INFORMATION

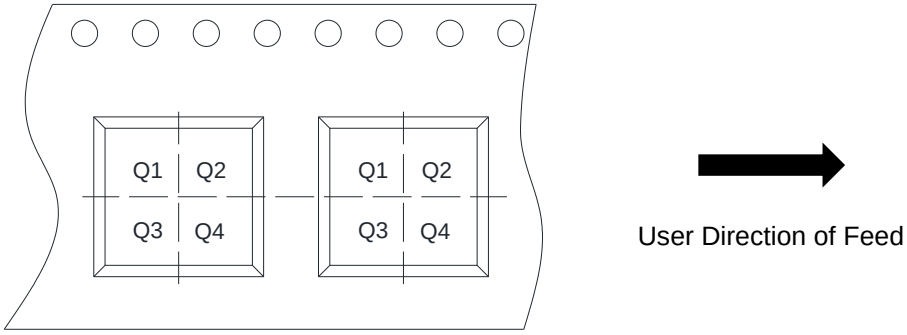
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



RD	Reel Dimension	☑ 7inch ☐ 13inch
W	Overall width of the carrier tape	☑ 8mm ☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☐ 2mm ☑ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☐ Q1 ☑ Q2 ☐ Q3 ☐ Q4