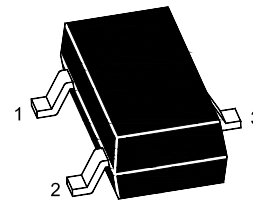
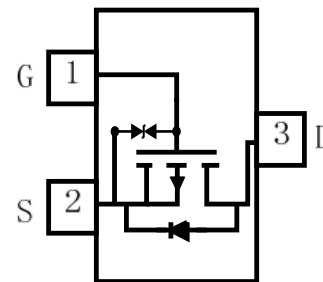


WPM5001
Single P-Channel, -50V, -0.2A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

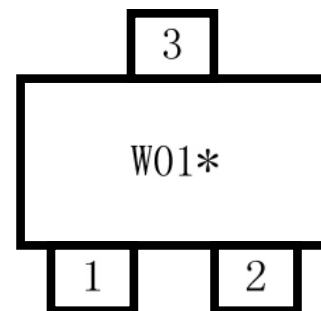
V_{DS} (V)	Typical $R_{DS(on)}$ ()
-50	3.0@ $V_{GS} = -10V$
	3.5@ $V_{GS} = -5V$
ESD Protected	


SOT-23
Descriptions

The WPM5001 is P-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 WPM5001 is Pb-free and Halogen-free.


Pin configuration (Top view)
Features

- Trench Technology
- Supper high density cell design
- Excellent ON resistance for higher DC current
- Extremely Low Threshold Voltage
- Small package SOT-23


W=Willsemi
01= Device Code
***= Month (A-Z)**
Marking
Applications

- Driver for Relay, Solenoid, Motor, LED etc.
- DC-DC converter circuit
- Power Switch
- Load Switch
- Charging

Order information

Device	Package	Shipping
WPM5001-3/TR	SOT-23	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 s	Steady State	Unit
Drain-Source Voltage		V_{DS}	-50		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current ^{a d}	$T_A=25^\circ\text{C}$	I_D	-0.2	-0.18	A
	$T_A=70^\circ\text{C}$		-0.16	-0.14	
Maximum Power Dissipation ^{a d}	$T_A=25^\circ\text{C}$	P_D	0.4	0.37	W
	$T_A=70^\circ\text{C}$		0.29	0.23	
Continuous Drain Current ^b	$T_A=25^\circ\text{C}$	I_D	-0.19	-0.17	A
	$T_A=70^\circ\text{C}$		-0.15	-0.14	
Maximum Power Dissipation ^b	$T_A=25^\circ\text{C}$	P_D	0.4	0.3	W
	$T_A=70^\circ\text{C}$		0.26	0.22	
Pulsed Drain Current ^c		I_{DM}	-0.8		A
Operating Junction Temperature		T_J	-55 to 150		$^\circ\text{C}$
Lead Temperature		T_L	260		$^\circ\text{C}$
Storage Temperature Range		T_{stg}	-55 to 150		$^\circ\text{C}$

Thermal resistance ratings

Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance ^a	$t \leq 10 \text{ s}$	$R_{\theta JA}$	240	270	$^\circ\text{C/W}$
	Steady State		280	335	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	270	300	
	Steady State		300	350	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	130	180	

a Surface mounted on FR-4 Board using 1 square inch pad size, 1oz copper

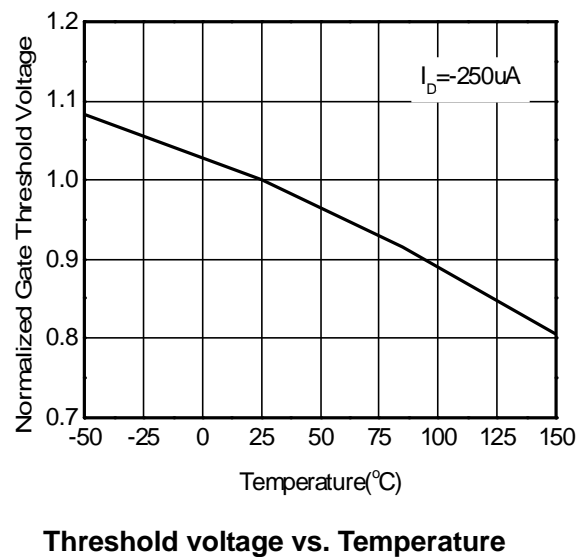
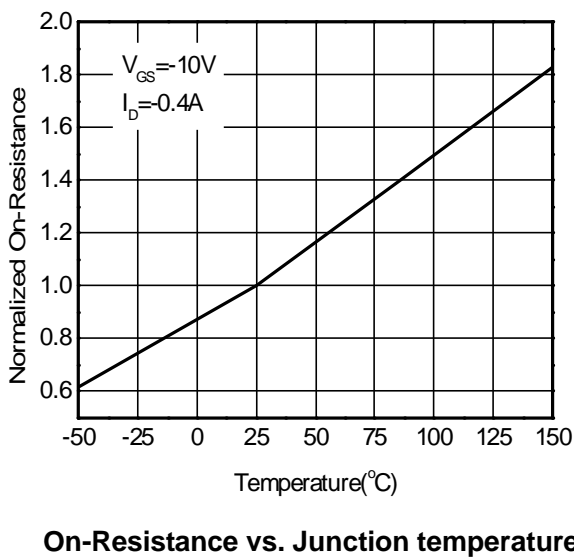
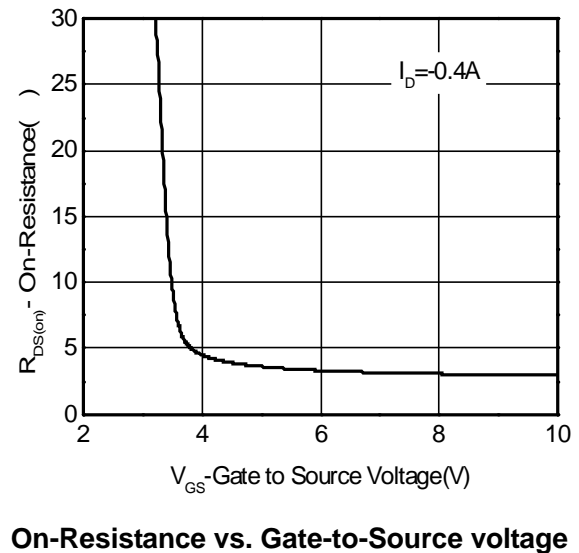
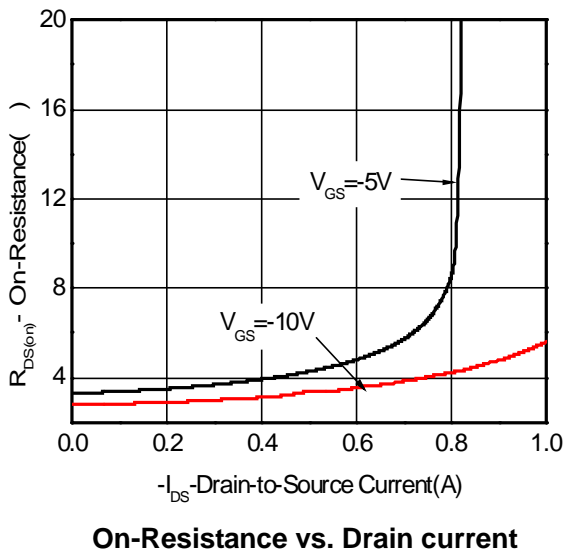
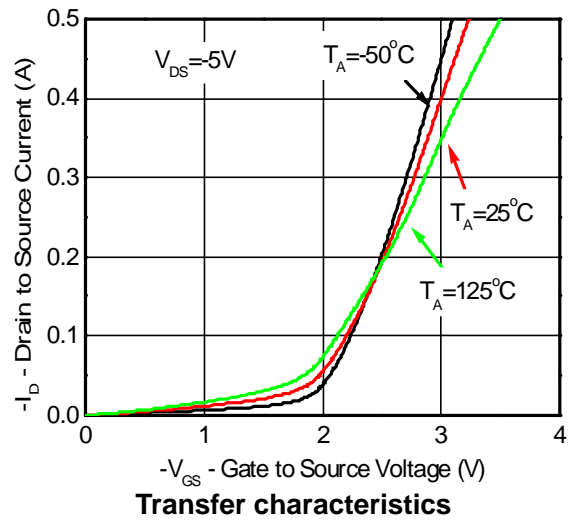
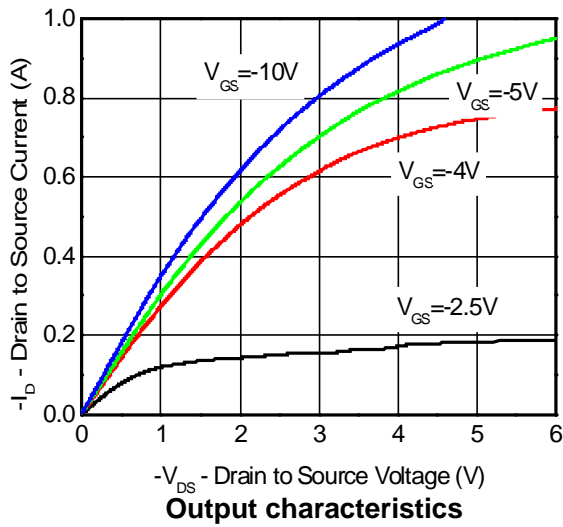
b Surface mounted on FR-4 board using minimum pad size, 1oz copper

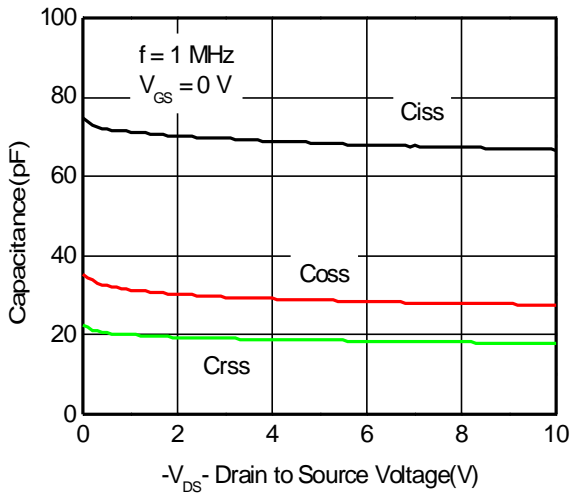
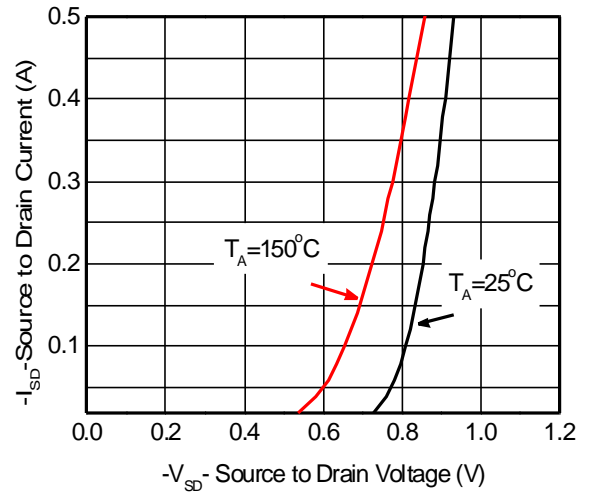
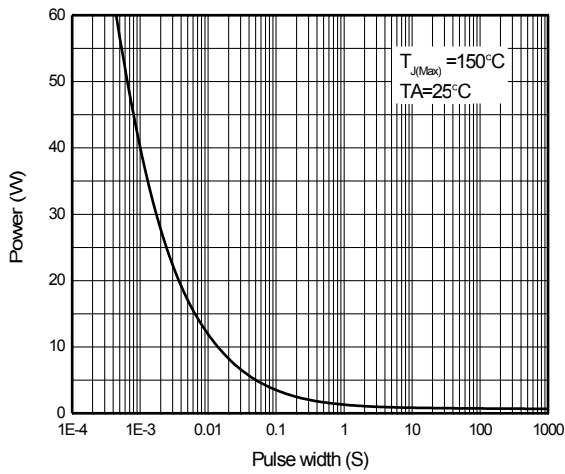
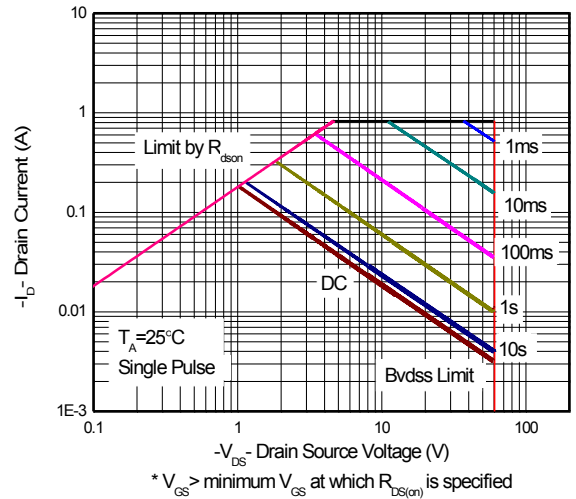
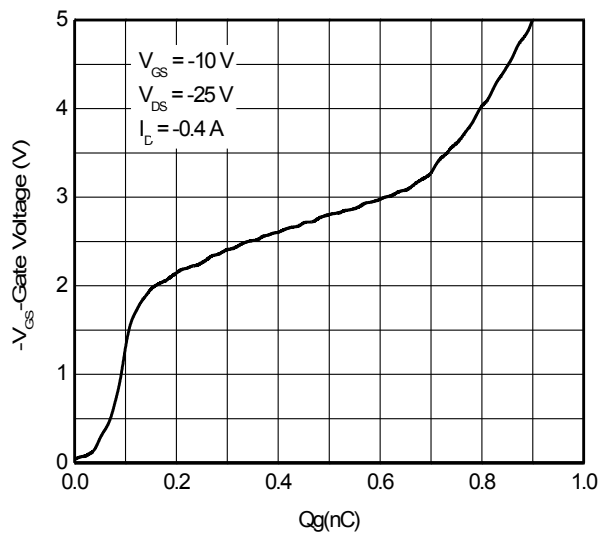
c Pulse width < 380 μs , Duty Cycle < 2%

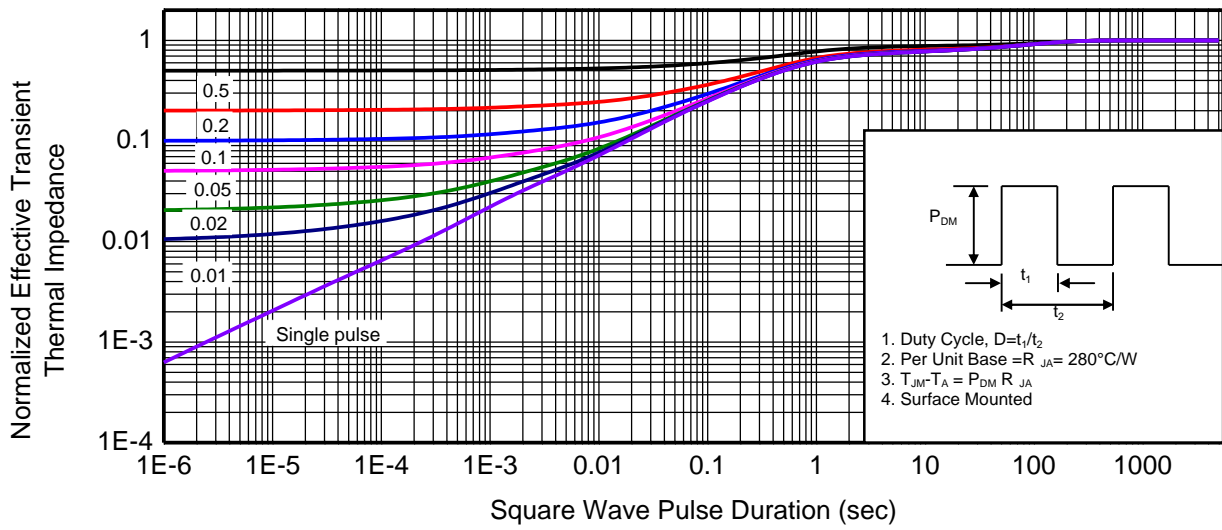
d Maximum junction temperature $T_J=150^\circ\text{C}$.

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}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-50			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -50\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 5	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-0.8	-1.5	-2.0	V
Drain-to-source On-resistance ^{b, c}	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -0.4\text{ A}$		3.0	8	
		$V_{GS} = -5\text{ V}, I_D = -0.3\text{ A}$		3.5	10	
Forward Trans conductance	g_{fs}	$V_{DS} = -25\text{ V}, I_D = -0.4\text{ A}$		0.4		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz},$ $V_{DS} = -10\text{ V}$		66.7		pF
Output Capacitance	C_{OSS}			27.4		
Reverse Transfer Capacitance	C_{RSS}			17.8		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -10\text{ V},$ $V_{DD} = -25\text{ V},$ $I_D = -0.4\text{ A}$		0.89		nC
Gate-to-Source Charge	Q_{GS}			0.16		
Gate-to-Drain Charge	Q_{GD}			0.57		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -10\text{ V},$ $V_{DD} = -10\text{ V},$ $I_D = 0.4\text{ A},$ $R_G = 6$		7.4		ns
Rise Time	t_r			4.2		
Turn-Off Delay Time	$t_d(OFF)$			11.6		
Fall Time	t_f			9.0		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -0.25\text{ A}$		-0.9	-1.5	V

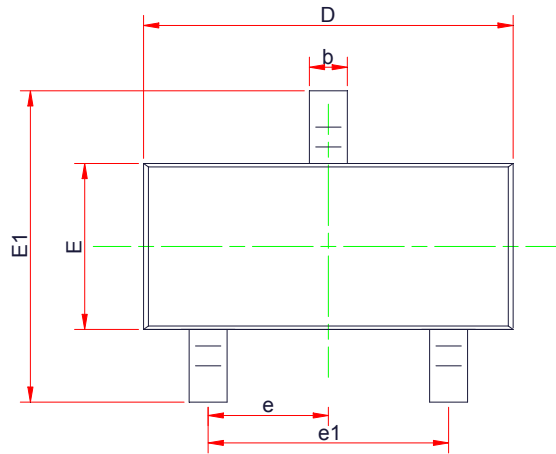
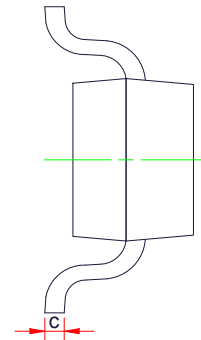
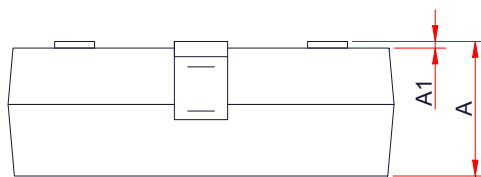
Typical Characteristics (Ta=25°C, unless otherwise noted)



Capacitance

Body diode forward voltage

Single pulse power

Safe operating power

Gate charge Characteristics

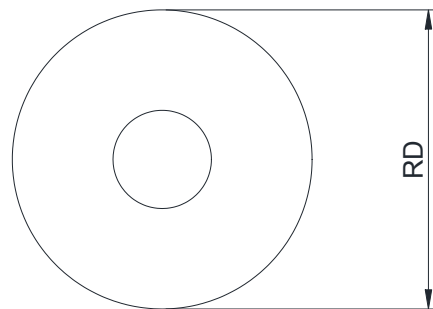
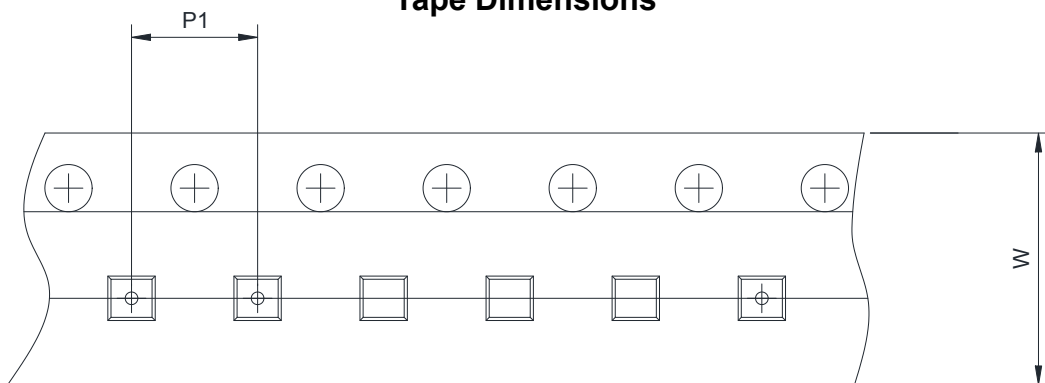
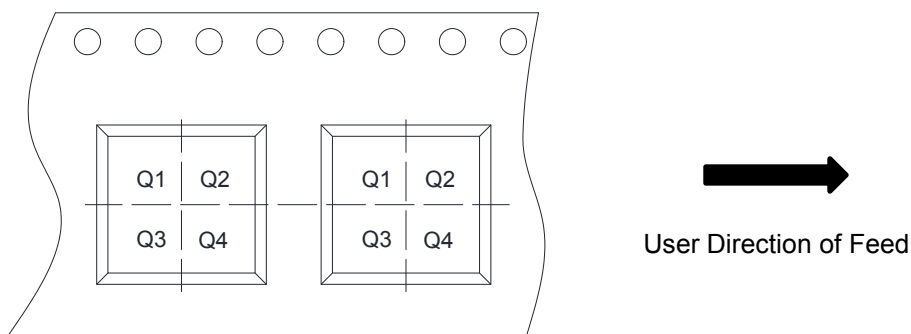


1. Duty Cycle, $D=t_1/t_2$
2. Per Unit Base $=R_{JA}=280^{\circ}\text{C}/\text{W}$
3. $T_{JM}-T_A = P_{DM} R_{JA}$
4. Surface Mounted

Transient thermal response (Junction-to-Ambient)

Package outline dimensions
SOT-23

TOP VIEW

SIDE VIEW

SIDE VIEW

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.89	1.10	1.30
A1	0.00	-	0.10
b	0.30	0.43	0.55
c	0.05	-	0.20
D	2.70	2.90	3.10
E	1.15	1.33	1.50
E1	2.10	2.40	2.70
e	0.95 Typ.		
e1	1.70	1.90	2.10

TAPE AND REEL INFORMATION
Reel Dimensions

Tape Dimensions

Quadrant Assignments For PIN1 Orientation In Tape


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input type="checkbox"/> 2mm	<input checked="" type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input type="checkbox"/> Q1	<input type="checkbox"/> Q2 <input checked="" type="checkbox"/> Q3 <input type="checkbox"/> Q4