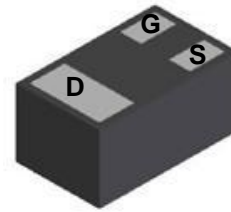


**WPM3027**

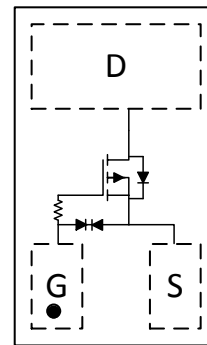
Single P-Channel, -30V, -0.57A, Power MOSFET

[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

V <sub>DS</sub> (V)	Typical R <sub>DS(on)</sub> (mΩ)
-30	415 @ V <sub>GS</sub> =-4.5V
	500 @ V <sub>GS</sub> =-2.5V
	600 @ V <sub>GS</sub> =-1.8V
ESD Protected	


**DFN1006-3L**
**Descriptions**

The WPM3027 is P-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent R<sub>DS(ON)</sub> with low gate charge. This device is suitable for use in DC-DC conversion, power switch and charging circuit. Standard Product WPM3027 is Pb-free.


**Features**

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage
- Small package DFN1006-3L

**Pin configuration (Top view)**


I = Device Code  
\* = Month(A~z)

**Marking**
**Applications**

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

**Order information**

Device	Package	Shipping
WPM3027-3/TR	DFN1006-3L	10K/Tape&Reel

**Absolute Maximum ratings**

Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-30		V	
Gate-Source Voltage	$V_{GS}$	$\pm 10$			
Continuous Drain Current <sup>a d</sup>	$I_D$	$T_A=25^\circ\text{C}$	-0.57	-0.53	A
		$T_A=70^\circ\text{C}$	-0.46	-0.42	
Maximum Power Dissipation <sup>a d</sup>	$P_D$	$T_A=25^\circ\text{C}$	0.32	0.27	W
		$T_A=70^\circ\text{C}$	0.2	0.18	
Continuous Drain Current <sup>b d</sup>	$I_D$	$T_A=25^\circ\text{C}$	-0.54	-0.5	A
		$T_A=70^\circ\text{C}$	-0.43	-0.4	
Maximum Power Dissipation <sup>b d</sup>	$P_D$	$T_A=25^\circ\text{C}$	0.28	0.25	W
		$T_A=70^\circ\text{C}$	0.18	0.16	
Pulsed Drain Current <sup>c</sup>	$I_{DM}$	-1.1		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 <sup>a</sup>	$R_{\theta JA}$	$t \leq 10 \text{ s}$	340	395	$^\circ\text{C/W}$
		Steady State	390	455	
Junction-to-Ambient Thermal Resistance <sup>b</sup>	$R_{\theta JA}$	$t \leq 10 \text{ s}$	387	441	
		Steady State	445	505	
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	240	285		

a Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper

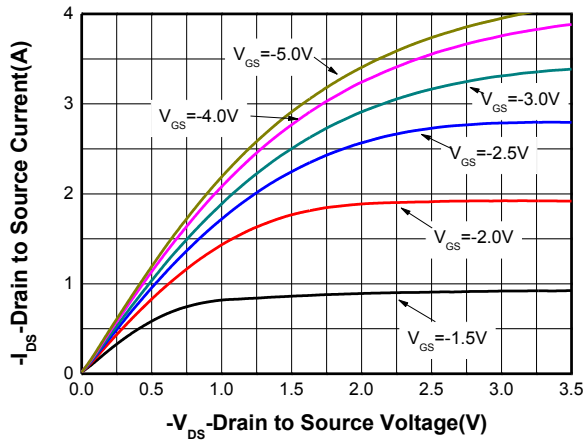
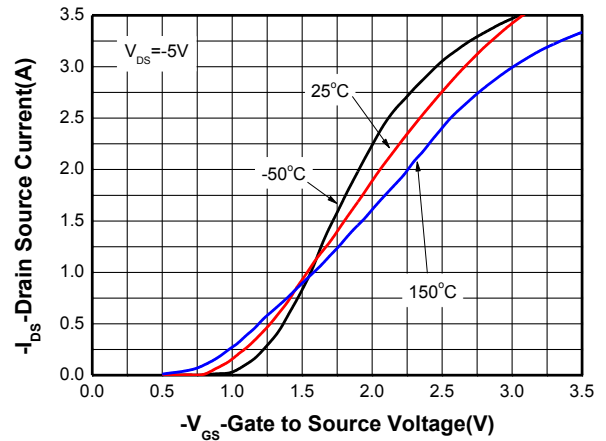
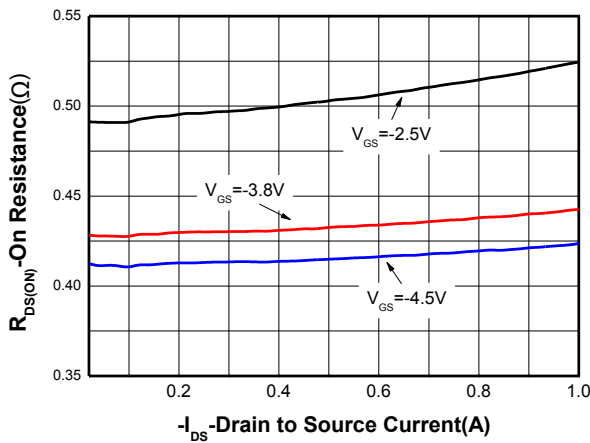
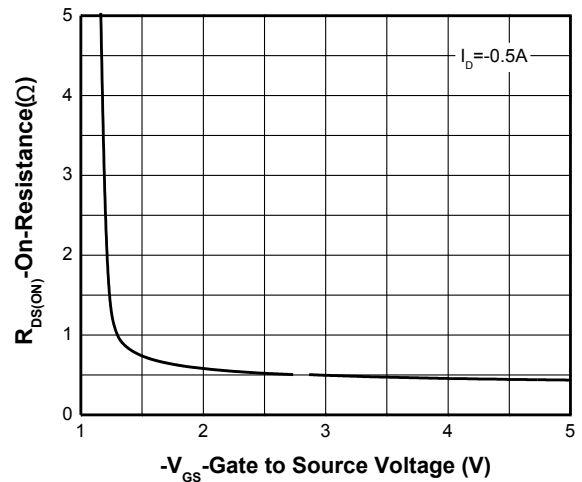
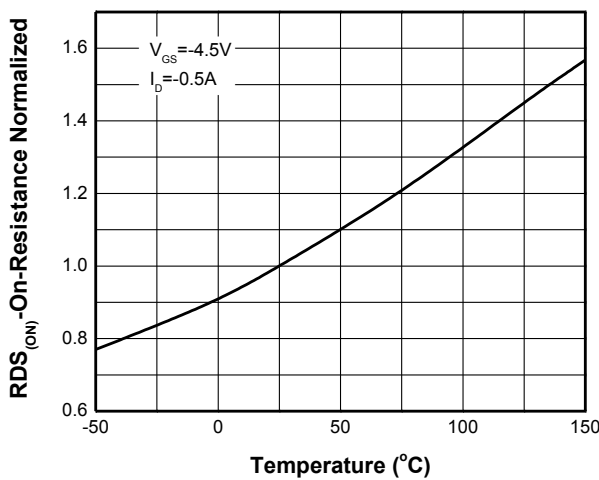
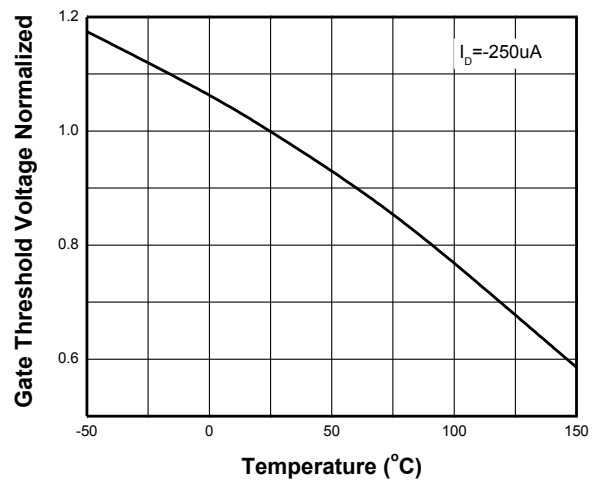
b Surface mounted on FR4 board using minimum pad size, 1oz copper

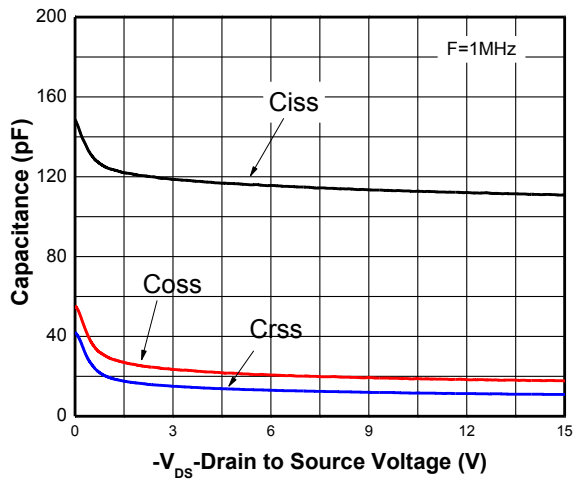
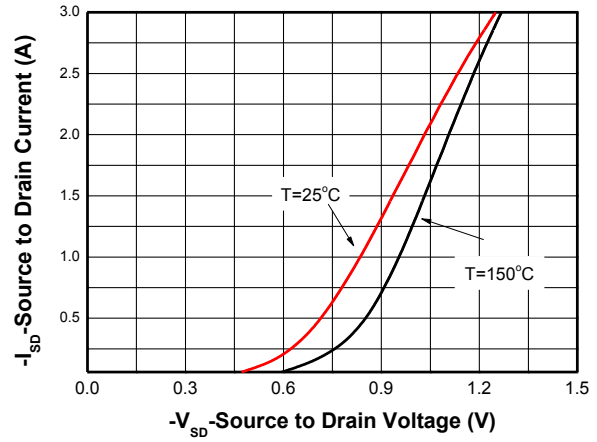
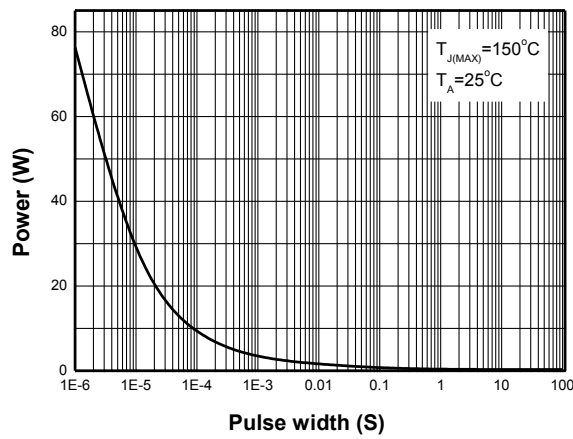
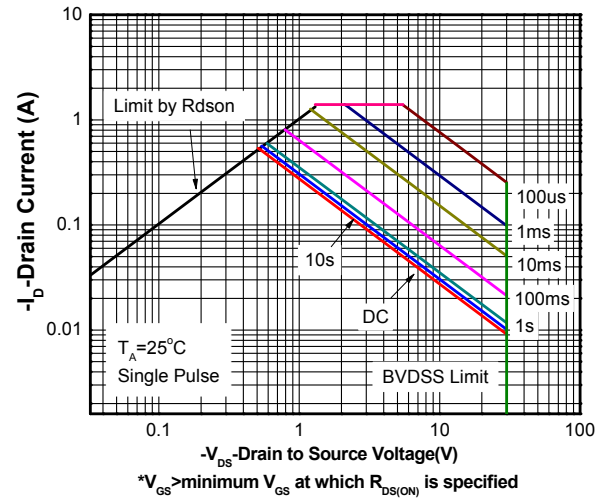
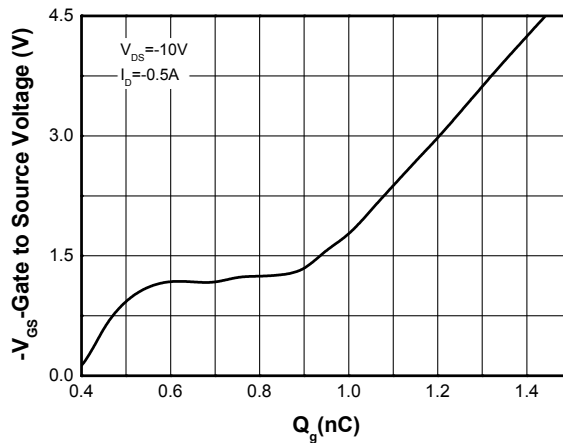
c Repetitive rating, pulse width limited by junction temperature,  $t_p=10\mu\text{s}$ , Duty Cycle=1%

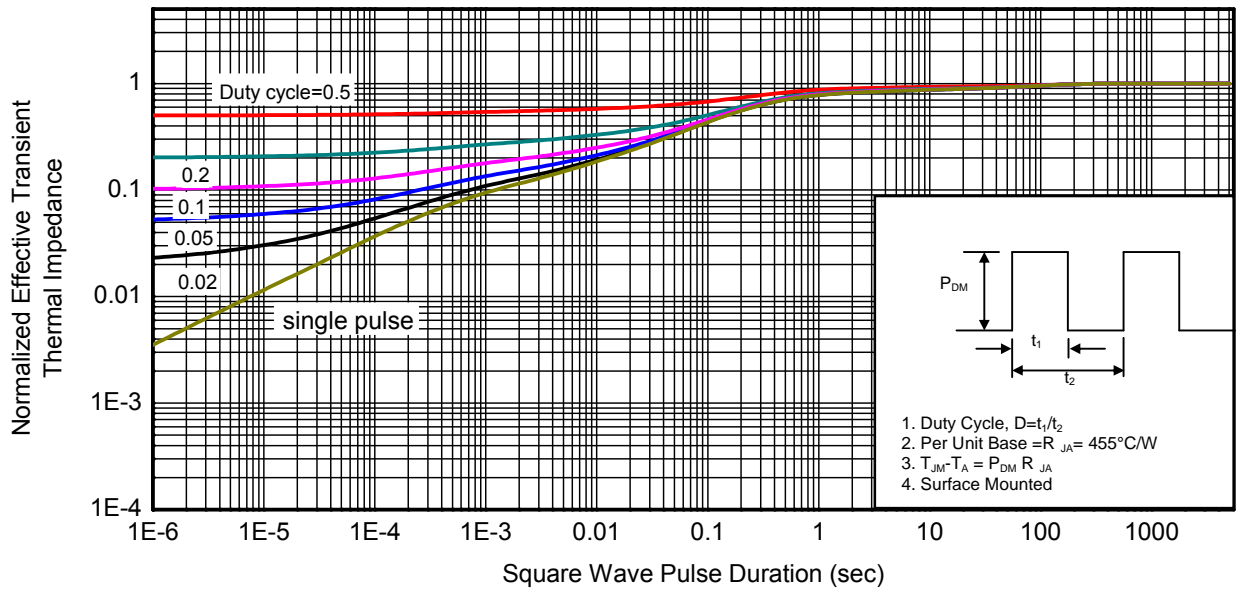
d Repetitive rating, pulse width limited by junction temperature  $T_J=150^\circ\text{C}$ .

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

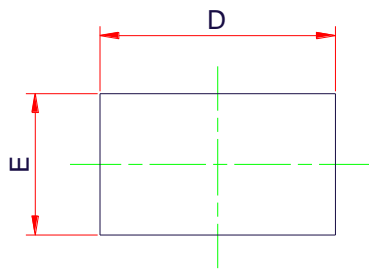
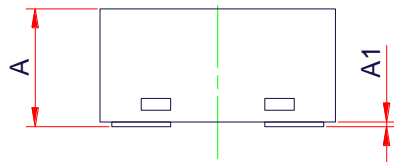
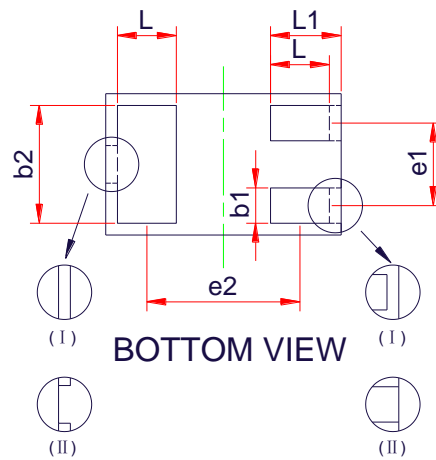
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -24V, V_{GS} = 0V$			-1	$\mu A$
Gate-to-source Leakage Current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 10V$			$\pm 5$	$\mu A$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-0.45	-0.65	-1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -0.2A$		415	650	m $\Omega$
		$V_{GS} = -2.5V, I_D = -0.1A$		500	800	
		$V_{GS} = -1.8V, I_D = -75mA$		600	950	
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	$C_{ISS}$	$V_{GS} = 0V, f = 1.0MHz, V_{DS} = -15V$		110		pF
Output Capacitance	$C_{OSS}$			18		
Reverse Transfer Capacitance	$C_{RSS}$			11		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5V, V_{DS} = -15V, I_D = -0.5A$		1.45		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.46		
Gate-to-Source Charge	$Q_{GS}$			0.6		
Gate-to-Drain Charge	$Q_{GD}$			0.44		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -4.5V, V_{DS} = -15V, I_D = -0.5A, R_G = 1\Omega$		8		ns
Rise Time	$t_r$			6		
Turn-Off Delay Time	$t_d(OFF)$			26		
Fall Time	$t_f$			4		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	$V_{SD}$	$V_{GS} = 0V, I_S = -0.3A$	-0.6	-0.75	-1.2	V

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

**Output characteristics**

**Transfer characteristics**

**On-Resistance vs. Drain current**

**On-Resistance vs. Gate-to-source voltage**

**On-Resistance vs. Junction temperature**

**Threshold voltage vs. Temperature**

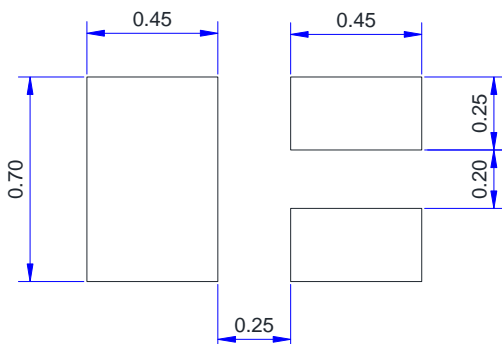

**Capacitance**

**Body diode forward voltage**

**Single pulse power**

**Safe operating power**

**Gate Charge Characteristics**



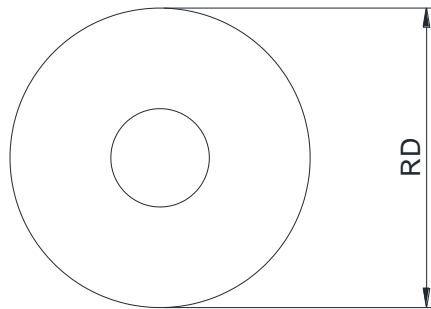
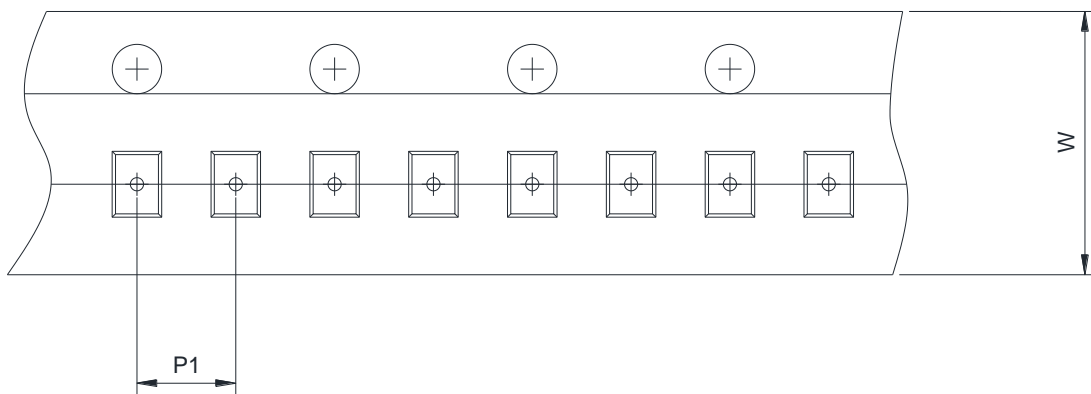
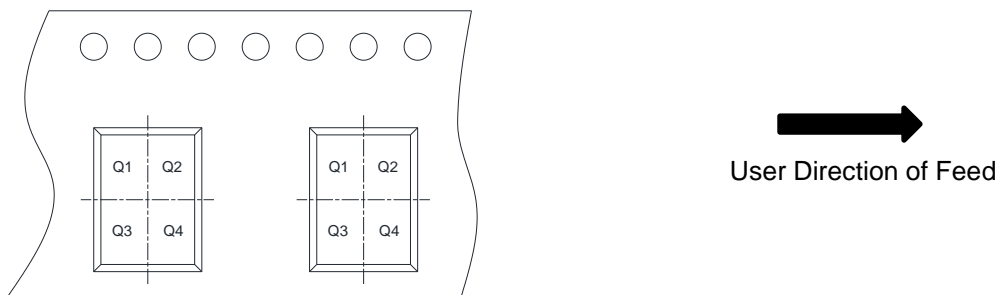
**Transient thermal response (Junction-to-Ambient)**

**PACKAGE OUTLINE DIMENSIONS**
**DFN1006-3L**

**TOP VIEW**

**SIDE VIEW**

**BOTTOM VIEW**

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.36	-	0.50
A1	0.00	-	0.05
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b1	0.10	0.15	0.20
b2	0.40	0.50	0.60
L	0.20	0.25	0.30
L1	0.20	0.30	0.40
e1	0.35Ref		
e2	0.65 Ref		

**Recommend PCB Layout (Unit: mm)**

**Notes:**

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.

**TAPE AND REEL INFORMATION**
**Reel Dimensions**

**Tape Dimensions**

**Quadrant Assignments For PIN1 Orientation In Tape**


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