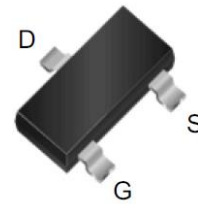
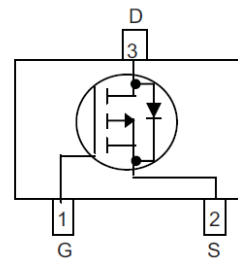


**WPM2081**
**Single P-Channel, -20V, -4A, Power MOSFET**
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

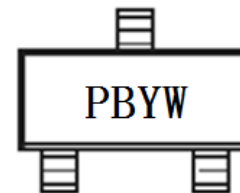
$V_{DS}$ (V)	Typical $R_{DS(on)}$ (m $\Omega$ )
-20	41 @ $V_{GS}=-4.5V$
	55 @ $V_{GS}=-2.5V$


**SOT-23**

**Pin configuration (Top view)**
**Descriptions**

The WPM2081 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 WPM2081 is Pb-free.

**Features**

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



PB = Device 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
WPM2081-3/TR	SOT-23	3000/Tape&Reel

**Absolute Maximum ratings**

Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	$V_{DS}$	-20		V	
Gate-Source Voltage	$V_{GS}$	$\pm 12$			
Continuous Drain Current <sup>a</sup>	$I_D$	$T_A=25^\circ\text{C}$	-4	-3.5	A
		$T_A=70^\circ\text{C}$	-3.2	-2.8	
Maximum Power Dissipation <sup>b</sup>	$P_D$	$T_A=25^\circ\text{C}$	0.96	0.80	W
		$T_A=70^\circ\text{C}$	0.62	0.52	
Pulsed Drain Current <sup>c</sup>	$I_{DM}$	-12		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**

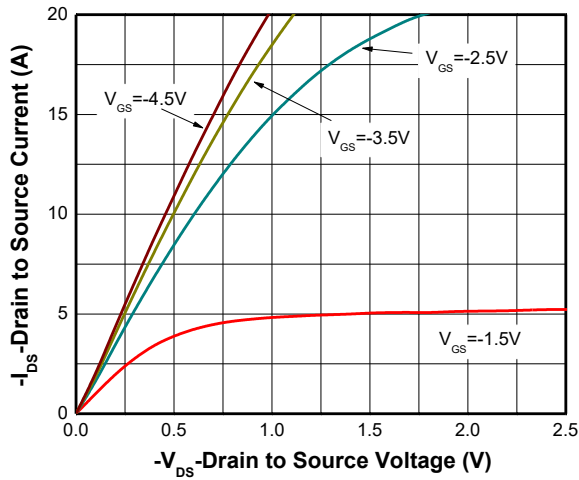
Single Operation					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient Thermal Resistance <sup>a</sup>	$t \leq 10\text{ s}$	$R_{\theta JA}$	79	99	$^\circ\text{C/W}$
	Steady State		104	130	
Junction-to-Case Thermal Resistance	Steady State	$R_{\theta JC}$	40	60	

- The value of  $R_{\theta JA}$  is measured with the device mounted on 1-inch<sup>2</sup> (6.45cm<sup>2</sup>) with 2oz.(0.071mm thick) Copper pad on a 1.5\*1.5 inch<sup>2</sup>, 0.06-inch thick FR4 PCB, in a still air environment with  $T_A = 25^\circ\text{C}$ . The value in any given application is determined by the user's specific board design
- The power dissipation  $P_D$  is based on Junction-to-Ambient thermal resistance  $R_{\theta JA}$   $t \leq 10\text{s}$  value and the  $T_{J(\text{MAX})}=150^\circ\text{C}$ .
- Repetitive rating, ~10us pulse width, duty cycle ~1%, keep initial  $T_J = 25^\circ\text{C}$ , the maximum allowed junction temperature of  $150^\circ\text{C}$ .
- The static characteristics are obtained using ~380us pulses, duty cycle ~1%.

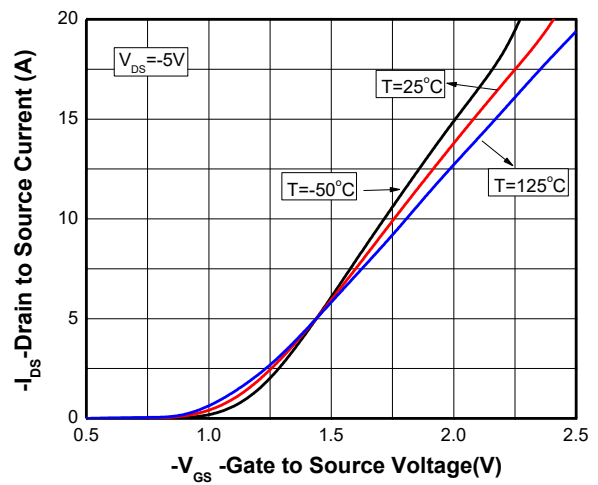
**Electronics Characteristics (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>OFF CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250uA	-20			V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = -16V, V <sub>GS</sub> = 0V			-1	uA
Gate-to-source Leakage Current	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±12V			±100	nA
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	V <sub>GS</sub> = V <sub>DS</sub> , I <sub>D</sub> = -250uA	-0.35	-0.65	-1	V
Drain-to-source On-resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -3.2A		41	52	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -3.0A		55	81	
		V <sub>GS</sub> = -1.8V, I <sub>D</sub> = -2.5A		72	110	
Forward Transconductance	g <sub>FS</sub>	V <sub>DS</sub> = -5 V, I <sub>D</sub> = -4A		6	16	S
<b>CHARGES, CAPACITANCES AND GATE RESISTANCE</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>GS</sub> = 0 V, f = 1.0MHz, V <sub>DS</sub> = -6 V		1062		pF
Output Capacitance	C <sub>OSS</sub>			146		
Reverse Transfer Capacitance	C <sub>RSS</sub>			124		
Total Gate Charge	Q <sub>G(TOT)</sub>	V <sub>GS</sub> = -4.5 V, V <sub>DS</sub> = -10 V, I <sub>D</sub> = -3.3 A		10		nC
Threshold Gate Charge	Q <sub>G(TH)</sub>			0.8		
Gate-to-Source Charge	Q <sub>GS</sub>			1.8		
Gate-to-Drain Charge	Q <sub>GD</sub>			1.7		
<b>SWITCHING CHARACTERISTICS</b>						
Turn-On Delay Time	td(ON)	V <sub>GS</sub> = -4.5 V, V <sub>DS</sub> = -6 V, I <sub>D</sub> = -3.3A, R <sub>G</sub> = 6Ω		11.4		ns
Rise Time	tr			6.8		
Turn-Off Delay Time	td(OFF)			67.6		
Fall Time	tf			16.8		
<b>BODY DIODE CHARACTERISTICS</b>						
Forward Voltage	V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = -3.2A		-0.8	-1.5	V

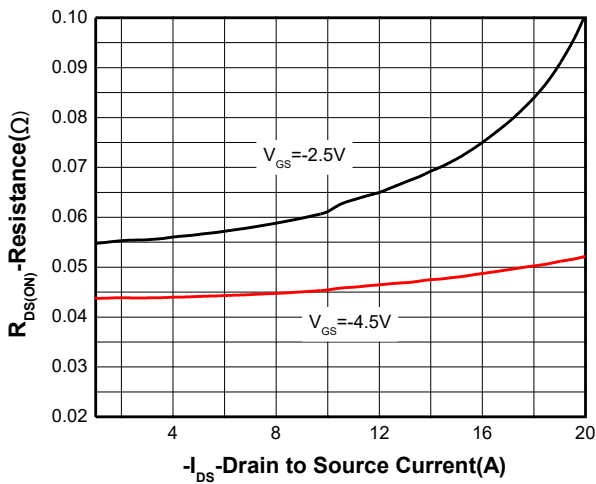
Typical Characteristics (Ta=25°C, unless otherwise noted)



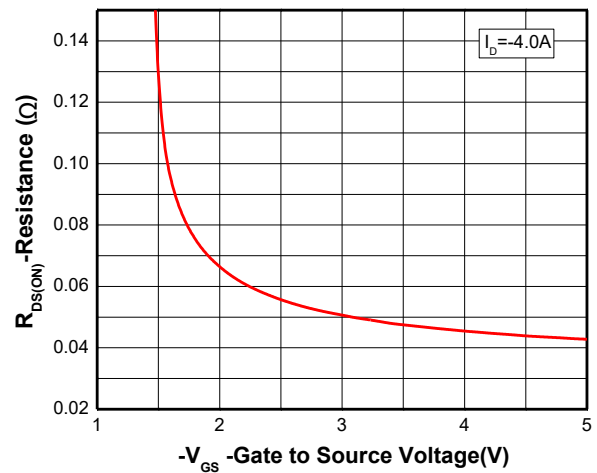
Output characteristics



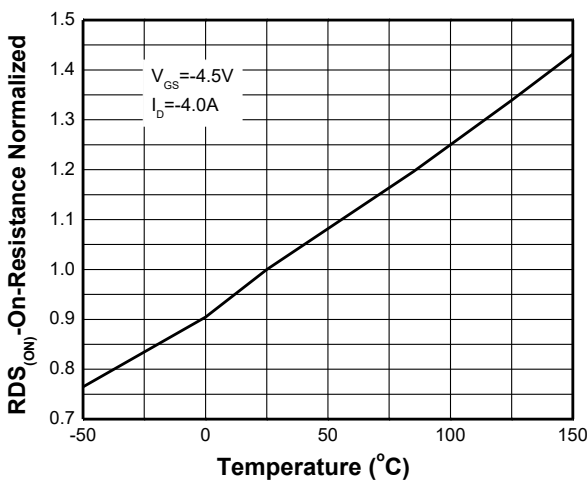
Transfer characteristics



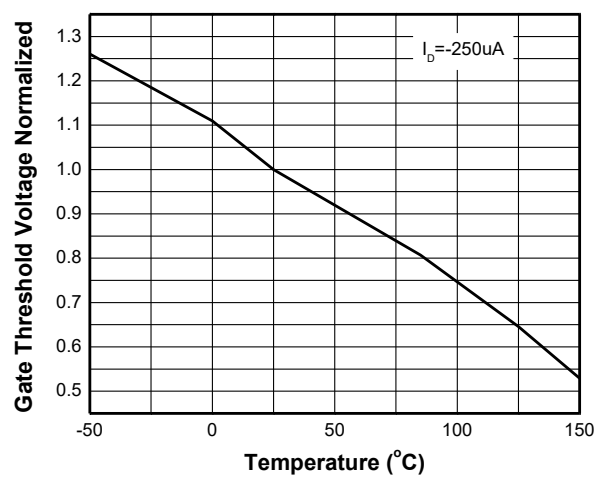
On-Resistance vs. Drain current



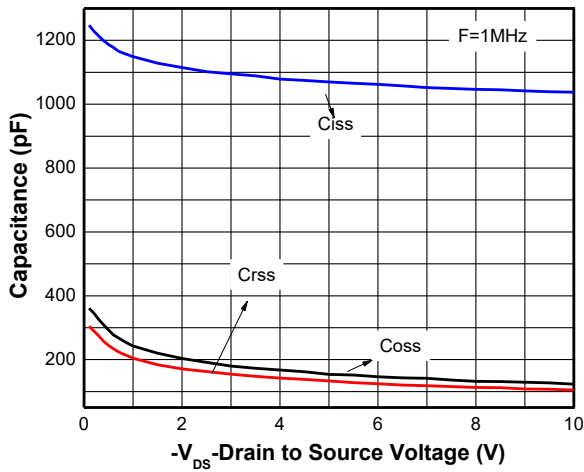
On-Resistance vs. Gate-to-source voltage



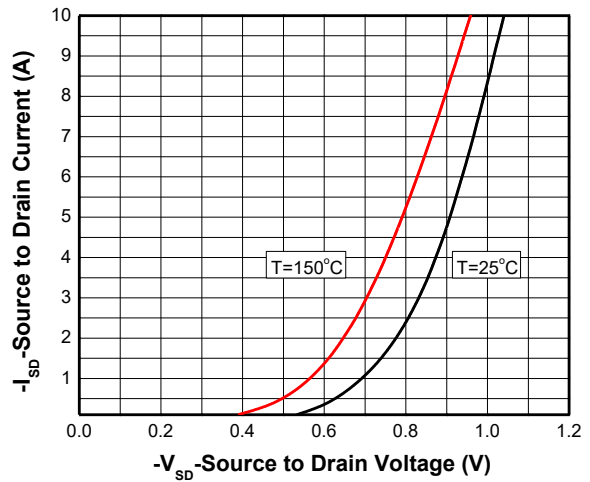
On-Resistance vs. Junction temperature



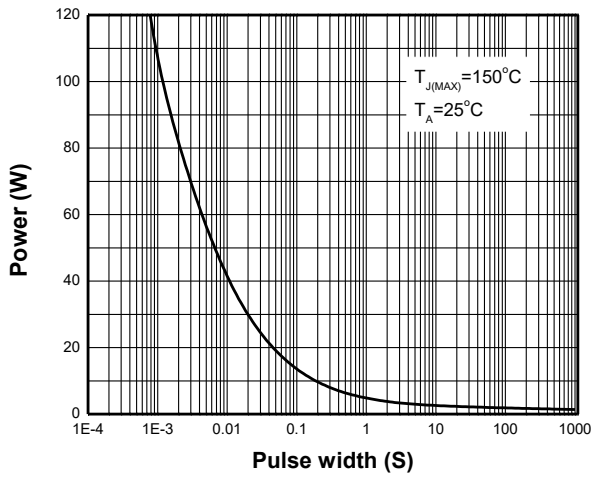
Threshold voltage vs. Temperature



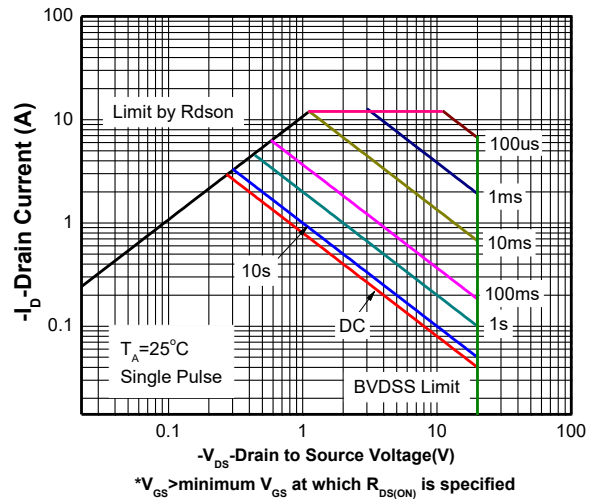
Capacitance



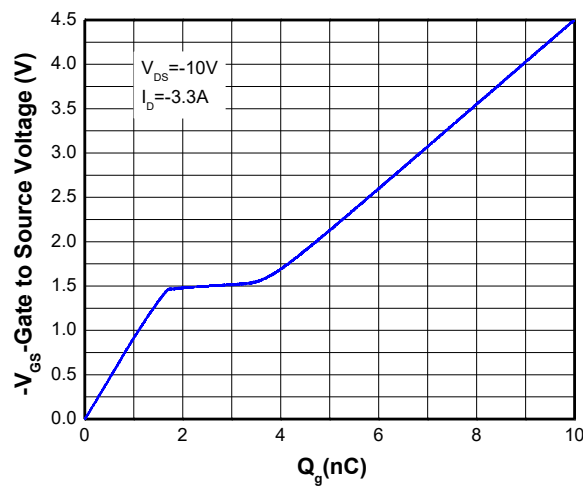
Body diode forward voltage



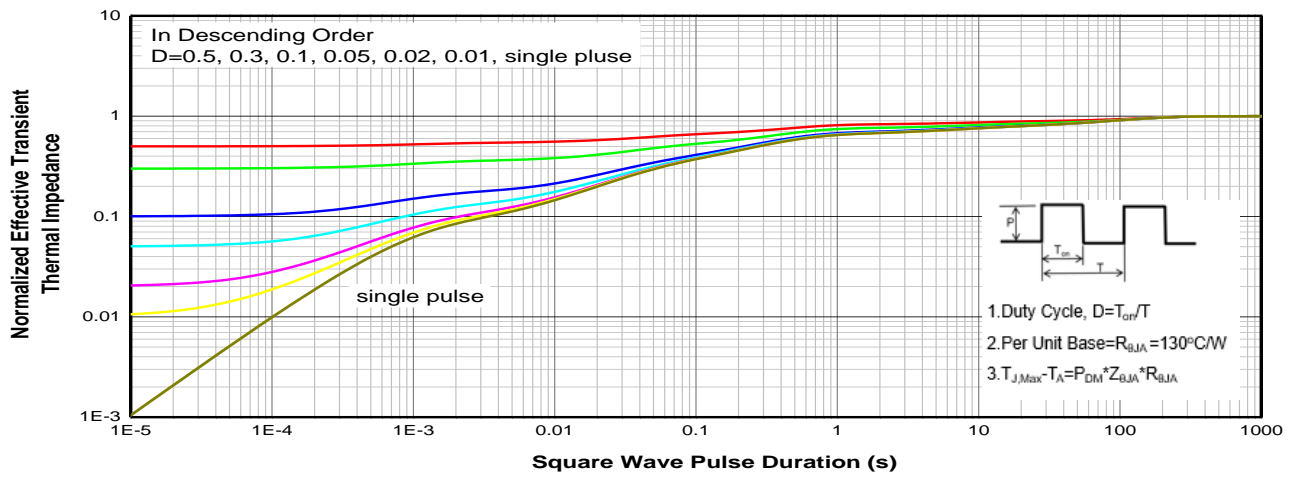
Single pulse power



Safe operating power



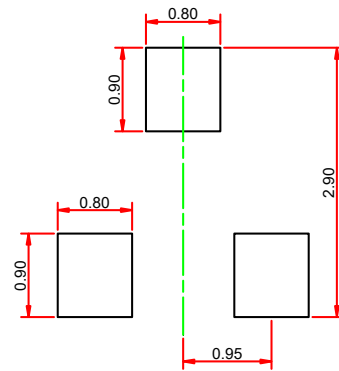
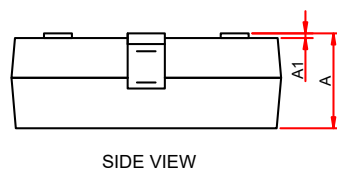
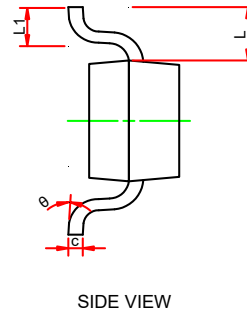
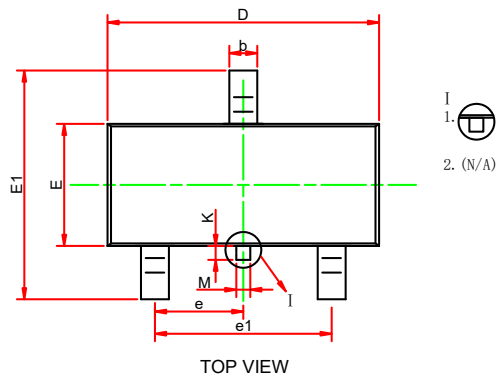
Gate Charge Characteristics



Transient Thermal Response (Junction-to-Ambient)

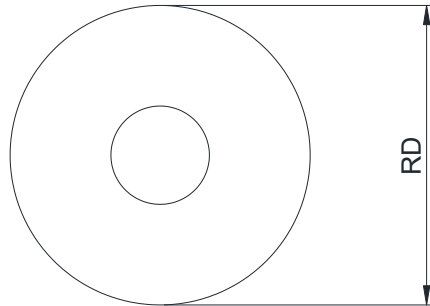
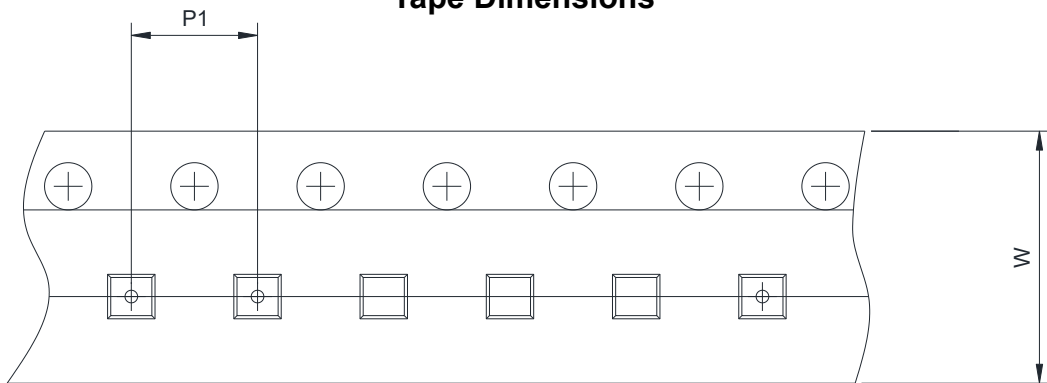
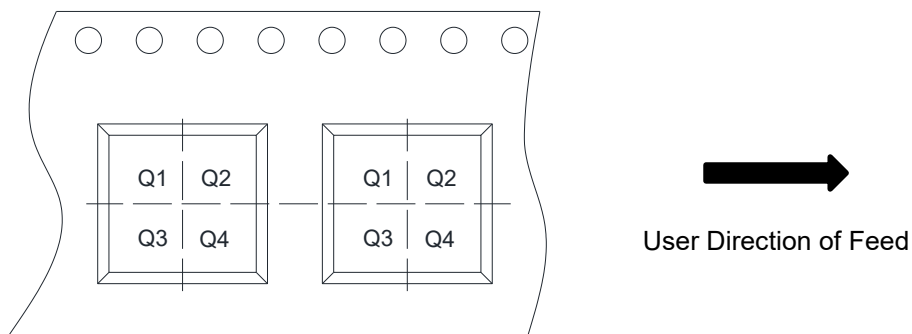
PACKAGE OUTLINE DIMENSIONS

SOT-23



RECOMMENDED LAND PATTERN(unit:mm)

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
L	0.45	0.55	0.65
L 1	0.20	0.35	0.60
M	0.10	0.15	0.25
K	0.00	-	0.25
θ	0 °	-	8 °

**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