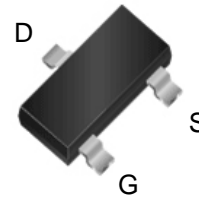
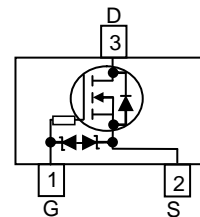
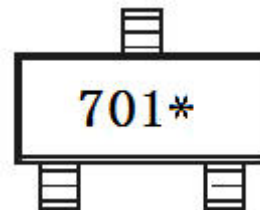


WNM7002
Single N-Channel, 60V, 0.3A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

V_{DS} (V)	Typical $R_{DS(on)}$ (Ω)
60	3.7 @ $V_{GS}= 10V$
	3.8 @ $V_{GS}= 4.5V$
ESD protected	


SOT-23

Pin configuration (Top view)


701 = Device Code

* = Month

Marking
Descriptions

The WNM7002 is 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 WNM7002 is Pb-free.

Features

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

Applications

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

Order information

Device	Package	Shipping
WNM7002-3/TR	SOT-23	3000/Tape&Reel

Absolute Maximum ratings

Parameter	Symbol	10 s	Steady State	Unit	
Drain-Source Voltage	V_{DS}	60		V	
Gate-Source Voltage	V_{GS}	± 20			
Continuous Drain Current ^{a d}	I_D	$T_A=25^\circ\text{C}$	0.30	0.28	A
		$T_A=70^\circ\text{C}$	0.24	0.22	
Maximum Power Dissipation ^{a d}	P_D	$T_A=25^\circ\text{C}$	0.96	0.83	W
		$T_A=70^\circ\text{C}$	0.61	0.53	
Continuous Drain Current ^{b d}	I_D	$T_A=25^\circ\text{C}$	0.26	0.25	A
		$T_A=70^\circ\text{C}$	0.21	0.20	
Maximum Power Dissipation ^{b d}	P_D	$T_A=25^\circ\text{C}$	0.78	0.66	W
		$T_A=70^\circ\text{C}$	0.50	0.42	
Pulsed Drain Current ^c	I_{DM}	1.2		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 ^a	$R_{\theta JA}$	$t \leq 10 \text{ s}$	105	130	$^\circ\text{C/W}$
		Steady State	130	150	
Junction-to-Ambient Thermal Resistance ^b	$R_{\theta JA}$	$t \leq 10 \text{ s}$	130	160	
		Steady State	145	190	
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	40	60		

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

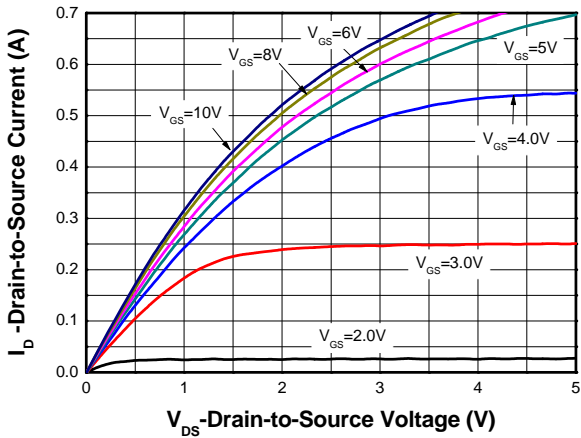
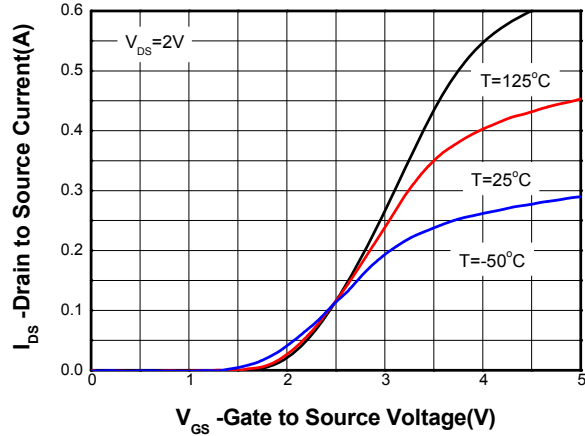
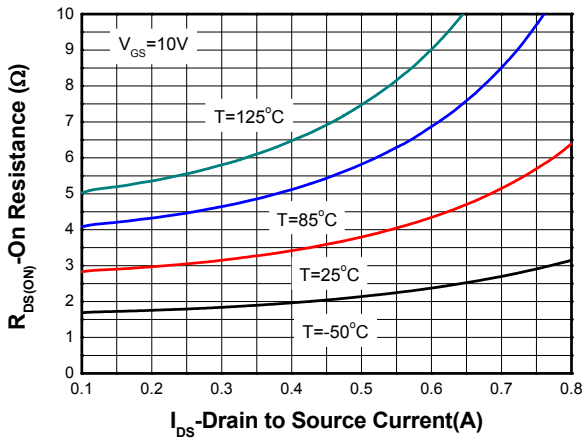
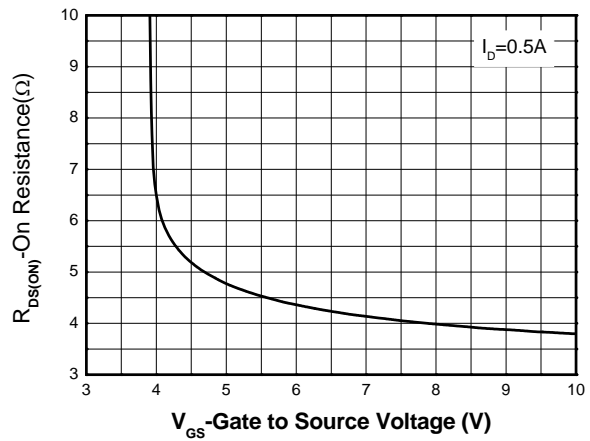
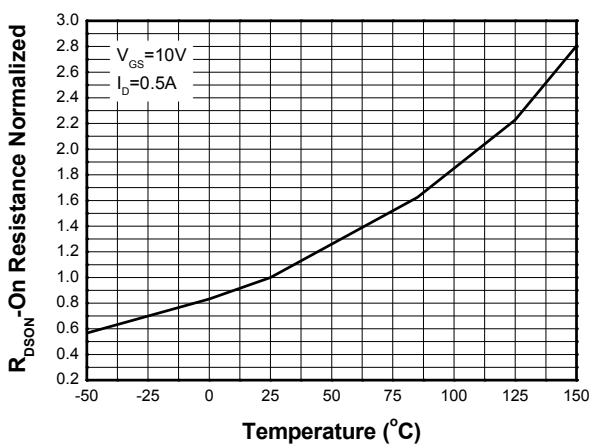
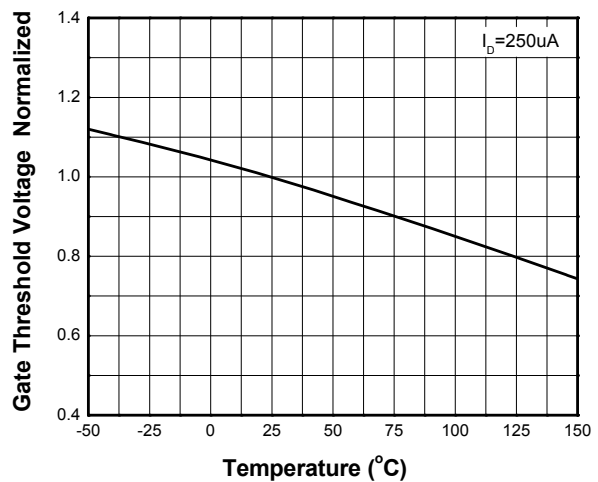
b Surface mounted on FR4 board using minimum pad size, 1oz copper

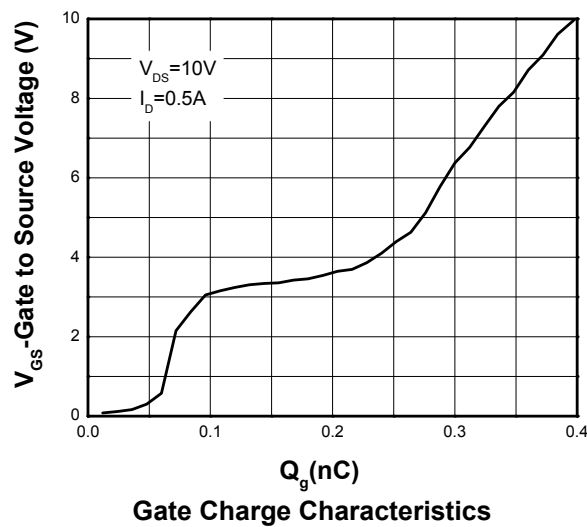
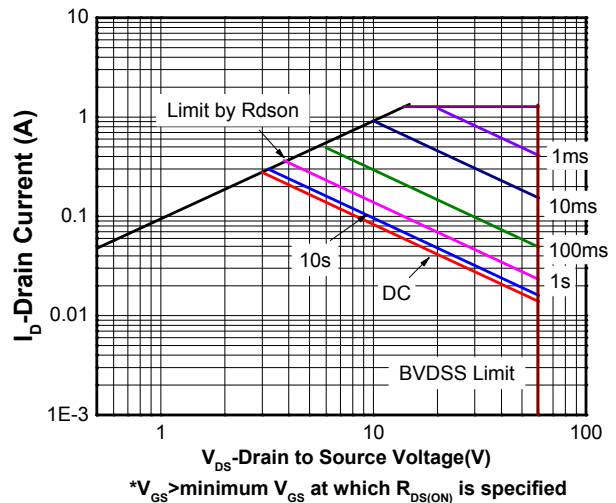
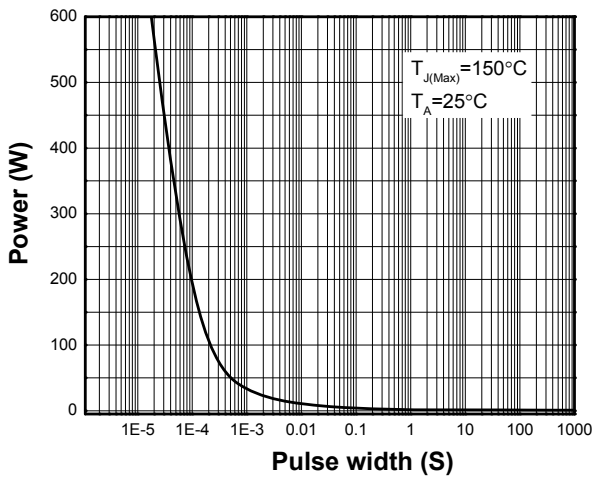
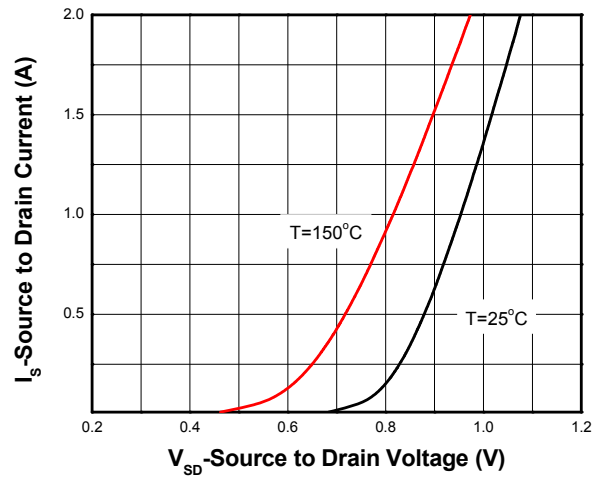
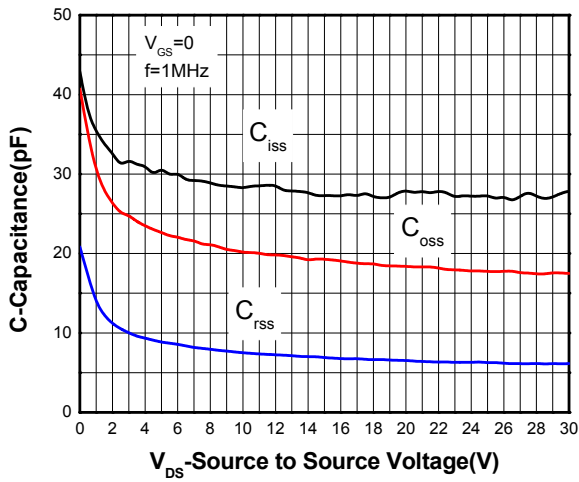
c Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%

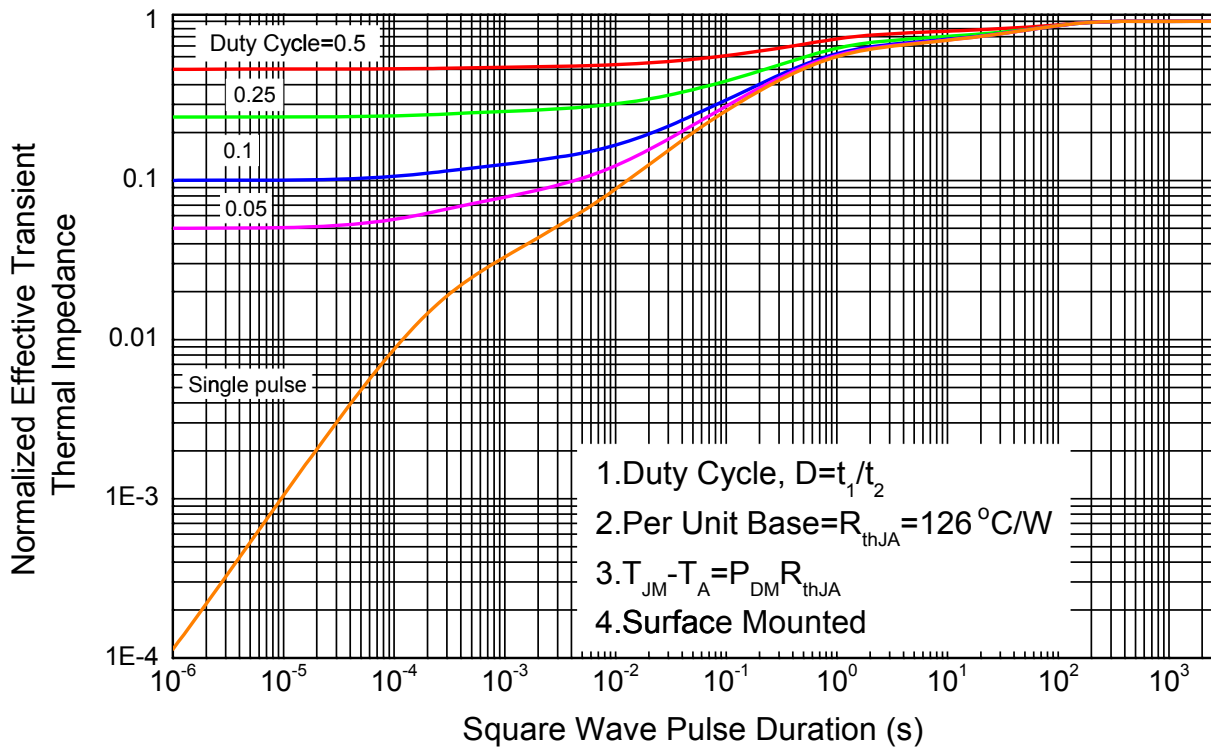
d Repetitive rating, pulse width limited by junction temperature $T_J=150^\circ\text{C}$.

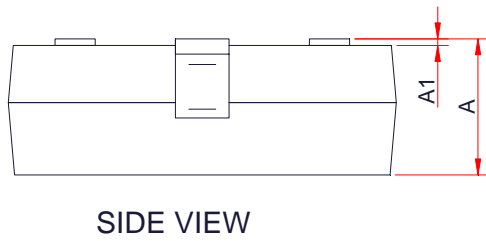
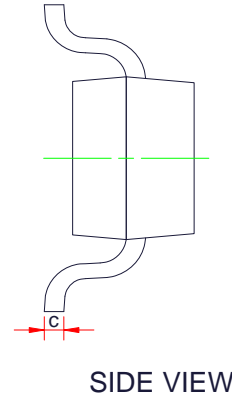
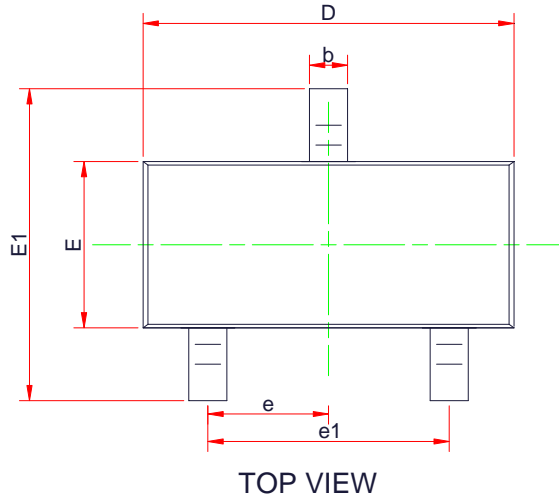
Electronics Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\mu\text{A}$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}$			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	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 250\mu\text{A}$	1.0	1.4	2.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 0.3\text{ A}$		3.7	4.7	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 0.2\text{ A}$		3.8	5.6	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = 25\text{ V}$		14.4		pF
Output Capacitance	C_{OSS}			5.1		
Reverse Transfer Capacitance	C_{RSS}			0.27		
Total Gate Charge1	$Q_{G(4.5V\text{ TOT})}$	$V_{GS} = 4.5\&10\text{ V}, V_{DS} = 15\text{ V}, I_D = 0.5\text{ A}$		0.26		nC
Total Gate Charge2	$Q_{G(10V\text{ TOT})}$			0.41		
Threshold Gate Charge	$Q_{G(TH)}$			0.06		
Gate-to-Source Charge	Q_{GS}			0.1		
Gate-to-Drain Charge	Q_{GD}			0.14		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = 10\text{ V}, V_{DS} = 30\text{ V}, R_L = 60\ \Omega, R_G = 25\ \Omega$		5.2		ns
Rise Time	t_r			17.2		
Turn-Off Delay Time	$t_d(OFF)$			32.4		
Fall Time	t_f			19.0		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 200\text{ mA}$		0.8	1.2	V

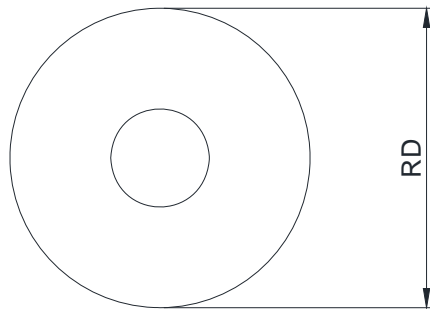
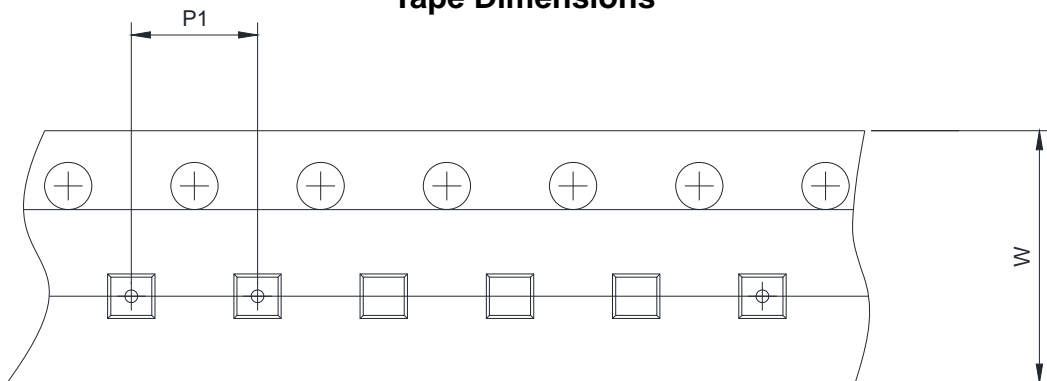
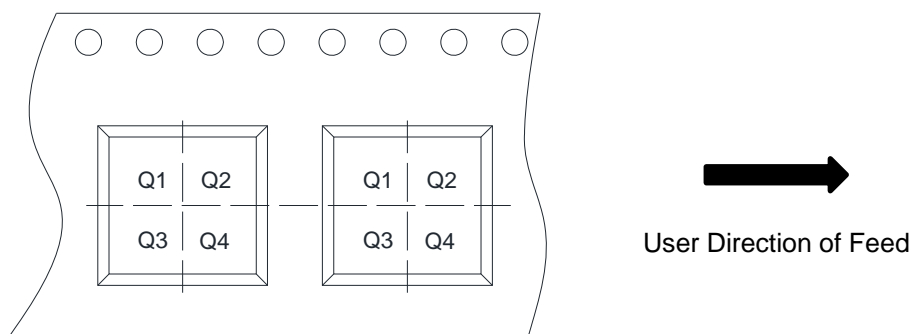
Typical Characteristics (Ta=25°C, unless otherwise noted)

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



Transient thermal response (Junction-to-Ambient)


Package outline dimensions
SOT-23


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