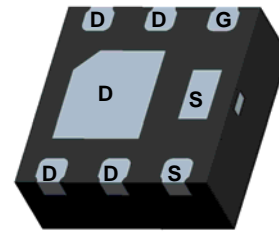
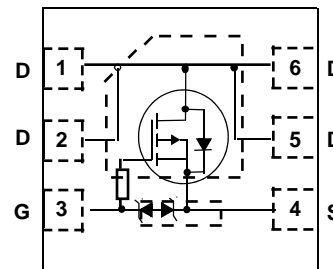


WPM2065
Single P-Channel, -20V, -6.9A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

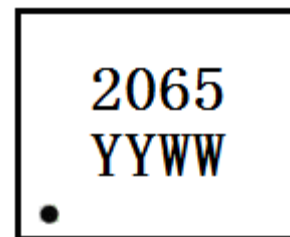
V _{DS} (V)	Typical R _{ds(on)} (Ω)
-20	0.017@ V _{GS} =-4.5V
	0.022@ V _{GS} =-2.5V
	0.032@ V _{GS} =-1.8V
ESD Rating: 4000V HBM	


DFN2X2-6L
Descriptions

The WPM2065 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 WPM2065 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
- HBM ESD protection > 4kV
- Small package DFN2X2-6L



2065 = Device Code
YY = Year
WW = Week

Marking
Applications

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

Order information

Device	Package	Shipping
WPM2065-6/TR	DFN2X2-6L	3000/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	± 8		
Continuous Drain Current ^{a d}	$T_A=25^\circ\text{C}$	I_D	-6.9	-6.2	A
	$T_A=70^\circ\text{C}$		-5.5	-5.0	
Maximum Power Dissipation ^{a d}	$T_A=25^\circ\text{C}$	P_D	1.7	1.4	W
	$T_A=70^\circ\text{C}$		1.1	0.9	
Continuous Drain Current ^{b d}	$T_A=25^\circ\text{C}$	I_D	-5.5	-4.4	A
	$T_A=70^\circ\text{C}$		-4.4	-3.5	
Maximum Power Dissipation ^{b d}	$T_A=25^\circ\text{C}$	P_D	1.1	0.7	W
	$T_A=70^\circ\text{C}$		0.7	0.4	
Pulsed Drain Current ^c		I_{DM}	-28		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	$t \leq 10 \text{ s}$	$R_{\theta JA}$	57	72	$^\circ\text{C/W}$
	Steady State		71	90	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	89	115	
	Steady State		126	181	
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	34	44	

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

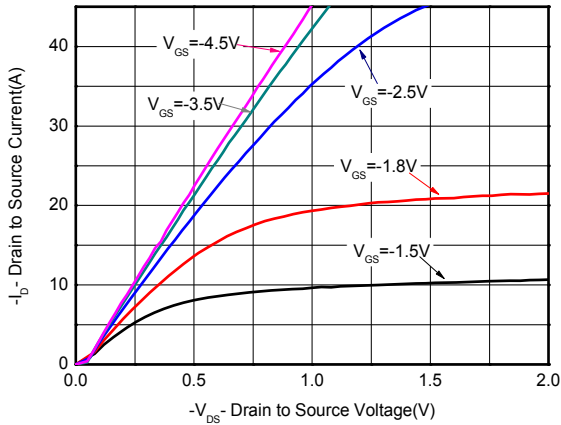
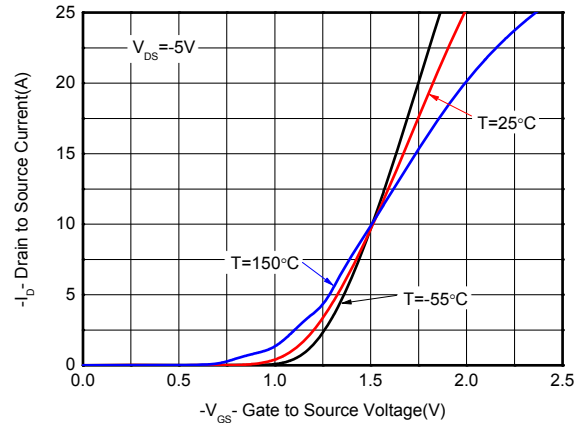
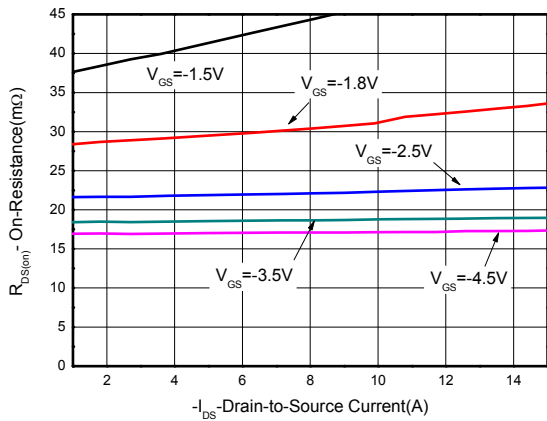
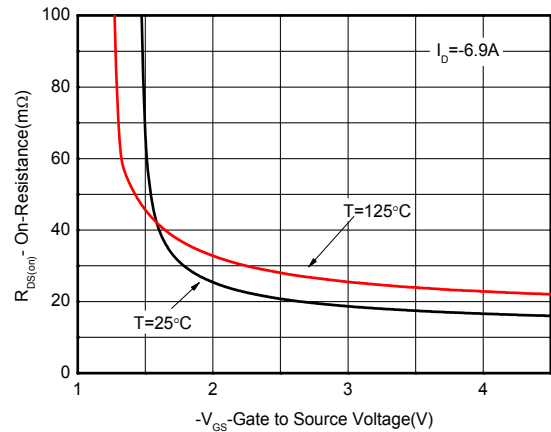
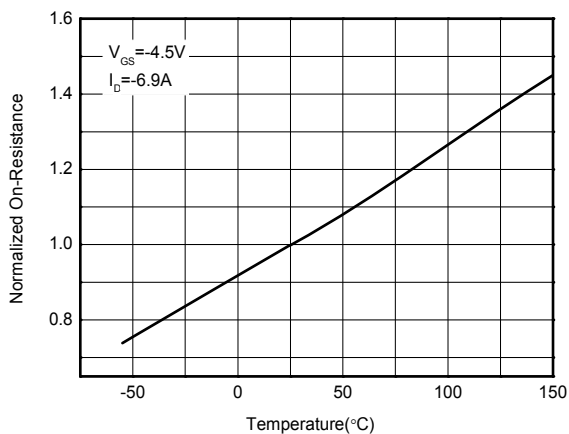
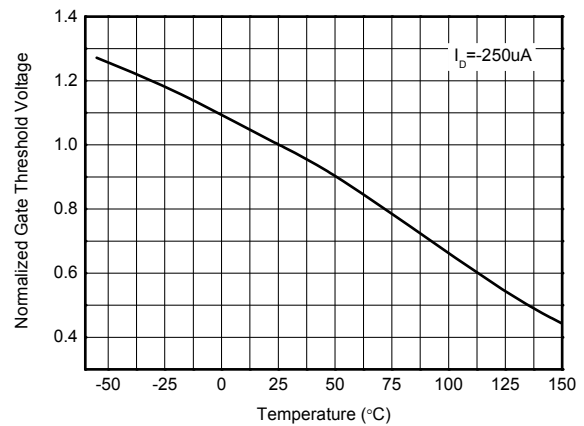
b Surface mounted on FR-4 board using minimum pad size, 1oz copper

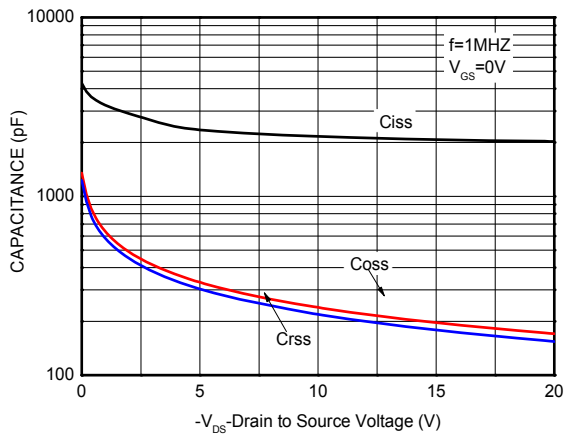
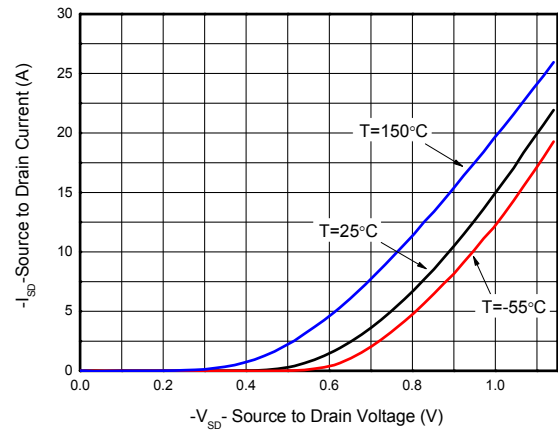
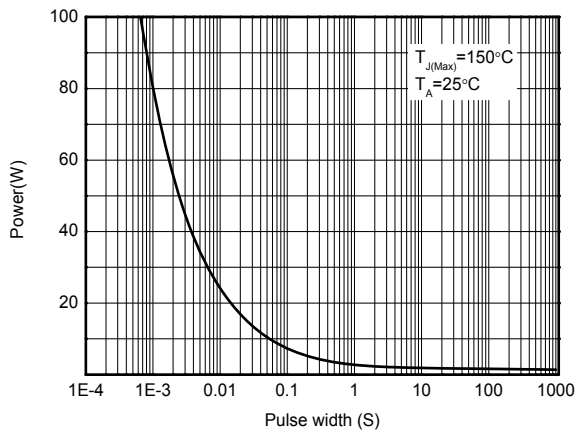
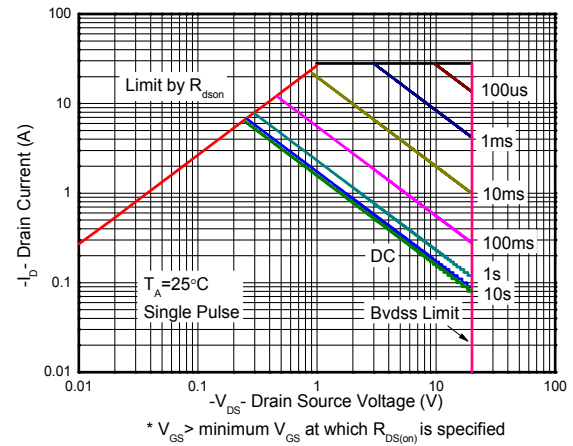
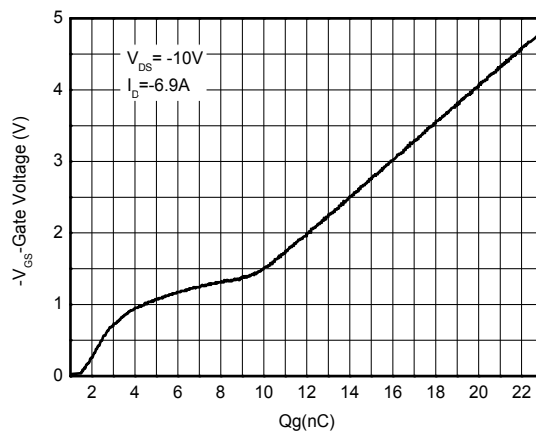
c Pulse width < 380 μs , Duty Cycle < 2%

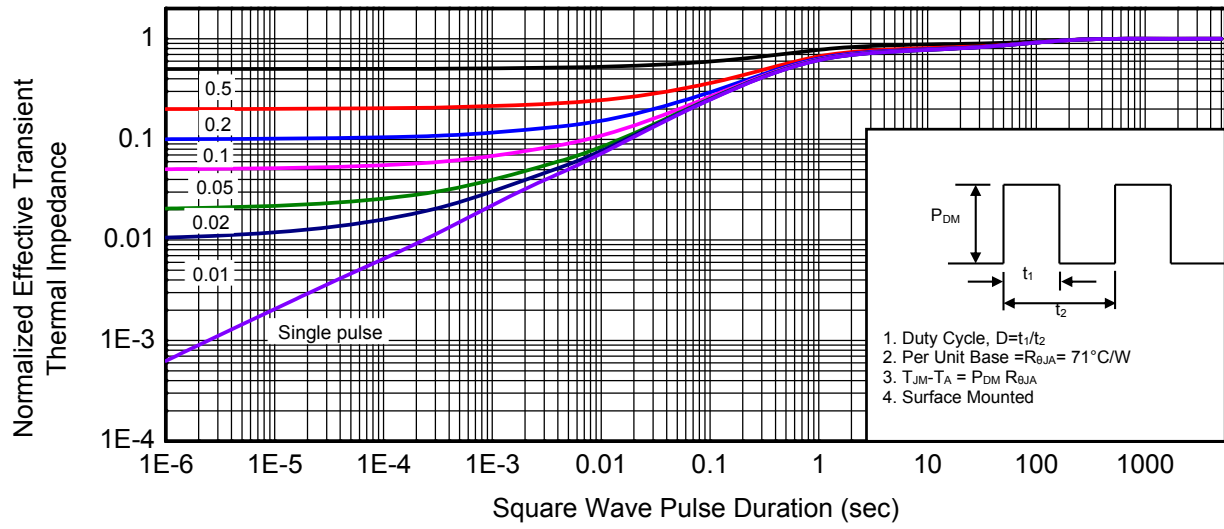
d Maximum junction temperature $T_J=150^\circ\text{C}$.

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

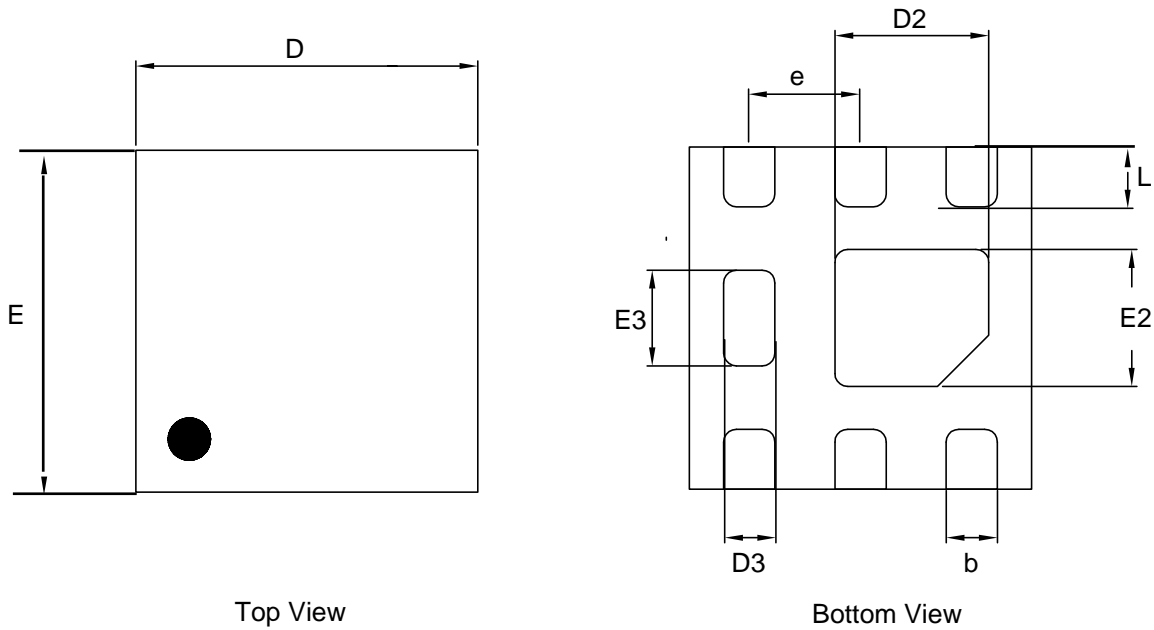
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16V, V_{GS} = 0V$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 8V$			± 5	μA
ON CHARACTERISTICS						
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 ^{b, c}	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -6.9A$		17	24	m Ω
		$V_{GS} = -2.5V, I_D = -6.1A$		22	29	
		$V_{GS} = -1.8V, I_D = -5.3A$		32	45	
Forward Trans conductance	g_{fs}	$V_{DS} = -5.0V, I_D = -6.9A$		50		S
CAPACITANCES, CHARGES						
Input Capacitance	C_{ISS}	$V_{GS} = 0V,$ $f = 1.0\text{ MHz},$ $V_{DS} = -10V$		2026		pF
Output Capacitance	C_{OSS}			225		
Reverse Transfer Capacitance	C_{RSS}			201		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5V,$ $V_{DD} = -10V,$ $I_D = -6.9A$		23		nC
Threshold Gate Charge	$Q_{G(TH)}$			2.5		
Gate-to-Source Charge	Q_{GS}			4		
Gate-to-Drain Charge	Q_{GD}			6		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -4.5V,$ $V_{DD} = -10V,$ $R_L = 3\Omega,$ $R_G = 6\Omega$		40		ns
Rise Time	t_r			76		
Turn-Off Delay Time	$t_d(OFF)$			284		
Fall Time	t_f			244		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = -6.9A$		-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)

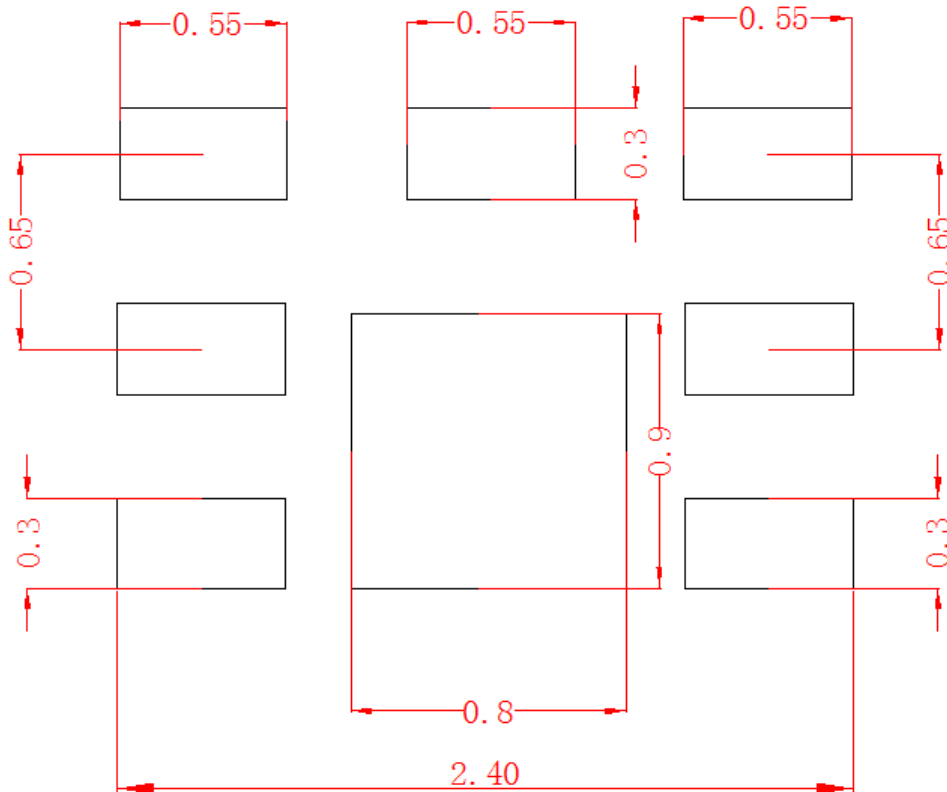
Package outline dimensions
DFN2X2-6L


Top View

Bottom View

Side View

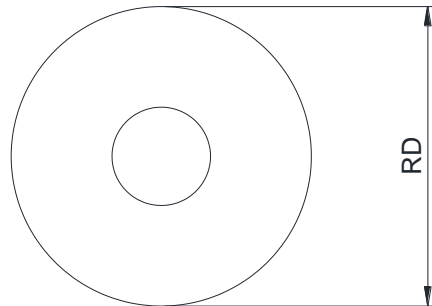
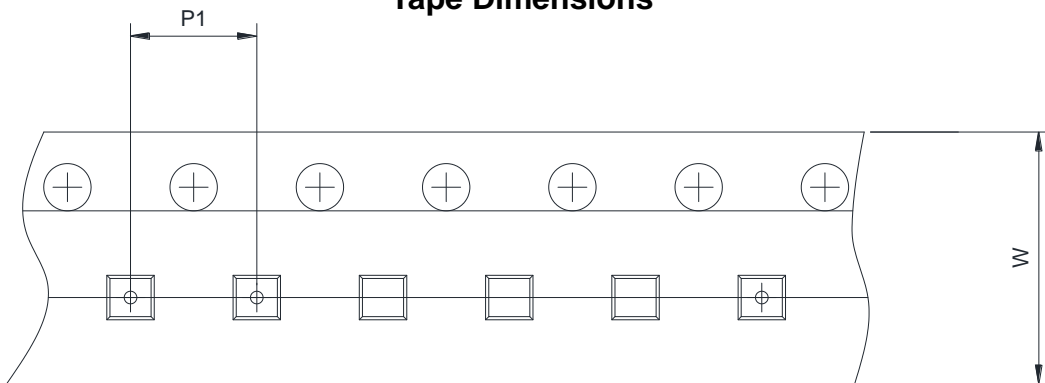
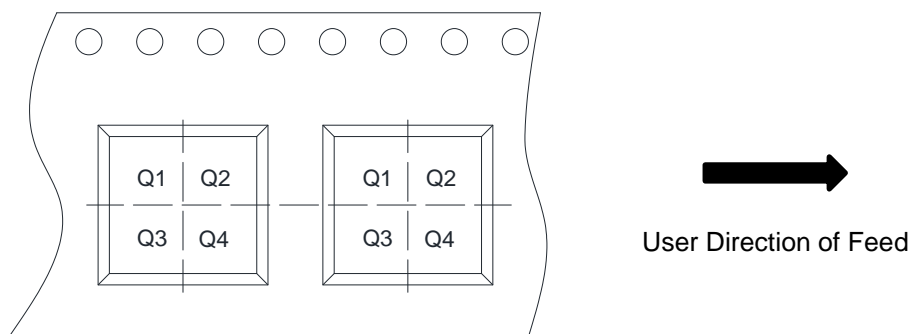
Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.70	0.75	0.80
A1	0.00	-	0.05
A3	0.203 Ref.		
D	1.95	2.00	2.05
E	1.95	2.00	2.05
D2	0.85	0.90	0.95
E2	0.75	0.80	0.85
D3	0.25	0.30	0.35
E3		0.56	
b	0.25	0.30	0.35
L	0.30	0.35	0.40
e	0.65 BSC.		

Suggested Pad 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"/> 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 checked="" type="checkbox"/> Q1	<input type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4