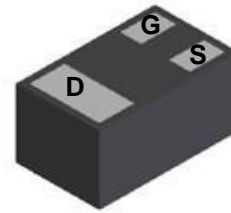
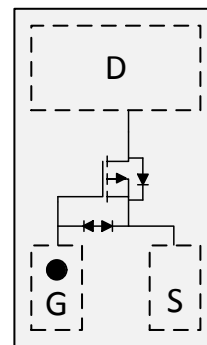


WPM2092
Single P-Channel, -20V, -0.74A, Power MOSFET
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)

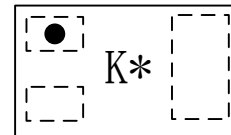
V_{DS} (V)	Typical $R_{DS(on)}$ ()
-20	0.230@ $V_{GS} = -4.5V$
	0.320@ $V_{GS} = -2.8V$
	0.355@ $V_{GS} = -2.5V$
	0.650@ $V_{GS} = -1.8V$
ESD Protected	


DFN1006-3L
Descriptions

The WPM2092 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 WPM2092 is Pb-free.


Features

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

Pin configuration (Top view)


K = 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
WPM2092-3/TR	DFN1006-3L	10K/Reel&Tape

Absolute Maximum ratings

Parameter		Symbol	10 S	Steady State	Unit
Drain-Source Voltage		V_{DS}	-20		V
Gate-Source Voltage		V_{GS}	± 10		
Continuous Drain Current ^a	$T_A=25^\circ\text{C}$	I_D	-0.74	-0.69	A
	$T_A=70^\circ\text{C}$		-0.59	-0.55	
Maximum Power Dissipation ^a	$T_A=25^\circ\text{C}$	P_D	0.32	0.27	W
	$T_A=70^\circ\text{C}$		0.20	0.18	
Continuous Drain Current ^b	$T_A=25^\circ\text{C}$	I_D	-0.70	-0.65	A
	$T_A=70^\circ\text{C}$		-0.56	-0.52	
Maximum Power Dissipation ^b	$T_A=25^\circ\text{C}$	P_D	0.28	0.25	W
	$T_A=70^\circ\text{C}$		0.18	0.16	
Pulsed Drain Current ^c		I_{DM}	-1.5		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	$t \leq 10 \text{ s}$	$R_{\theta JA}$	340	395	$^\circ\text{C/W}$
	Steady State		390	455	
Junction-to-Ambient Thermal Resistance ^b	$t \leq 10 \text{ s}$	$R_{\theta JA}$	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

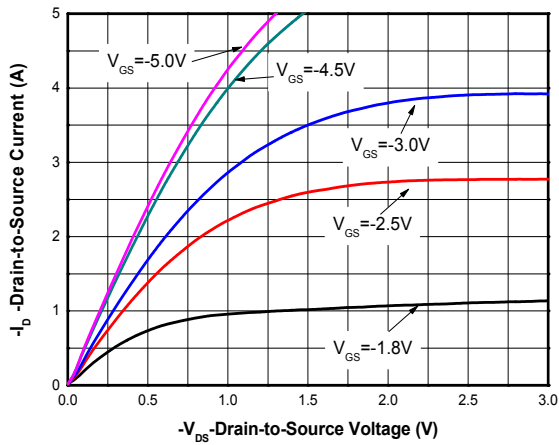
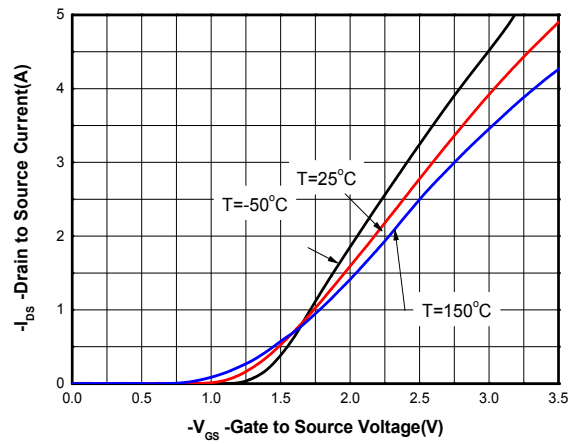
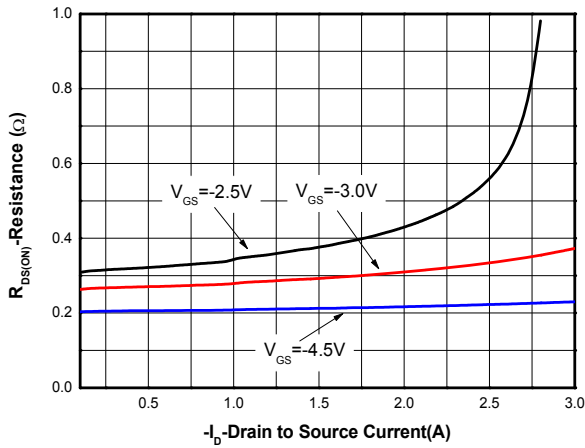
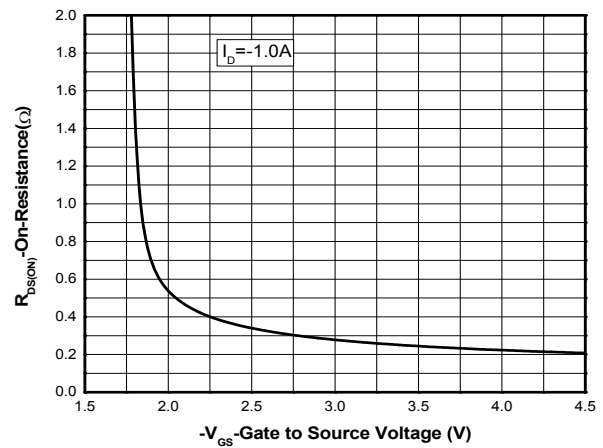
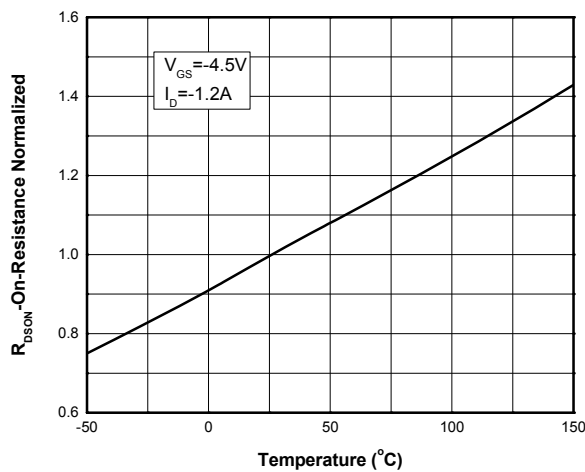
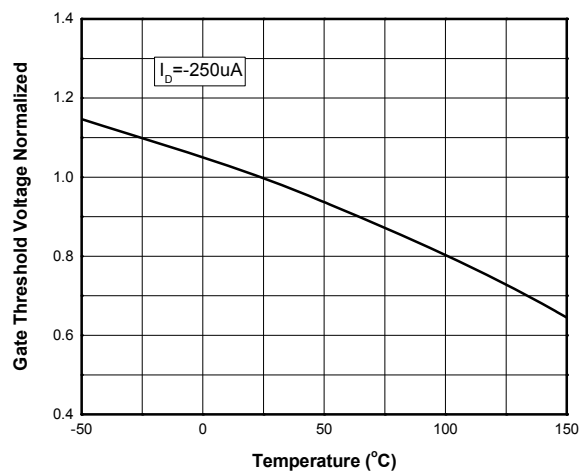
b Surface mounted on FR4 board using minimum pad size, 1oz copper

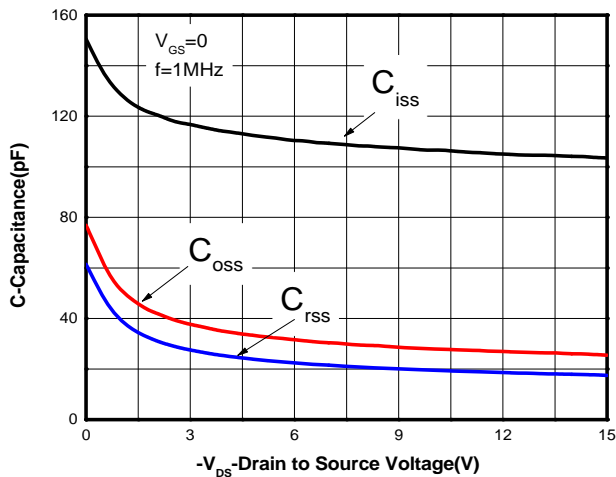
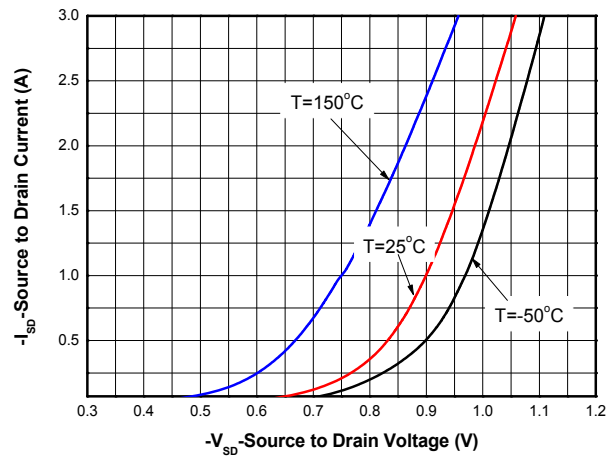
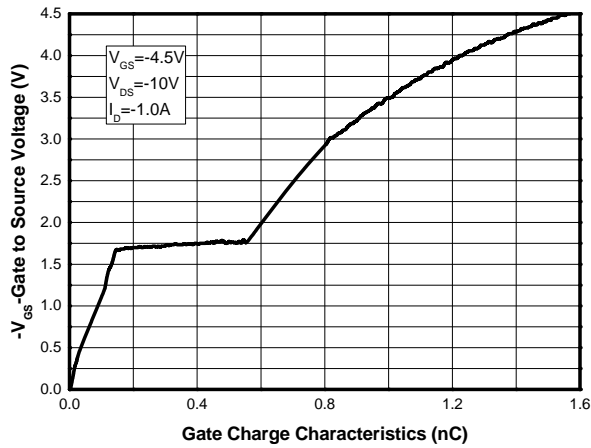
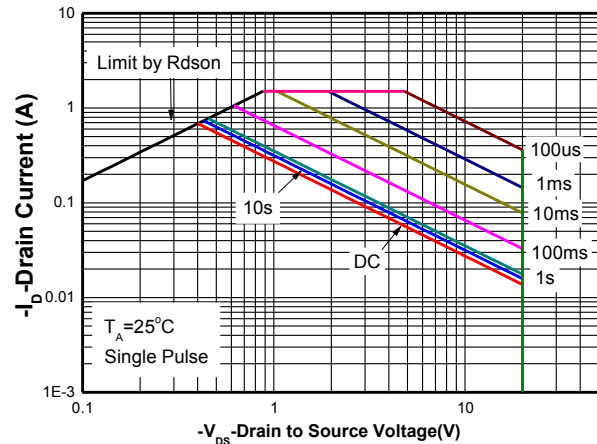
c Repetitive rating, pulse width limited by junction temperature, $t_p=10\mu\text{s}$, Duty Cycle=1%

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

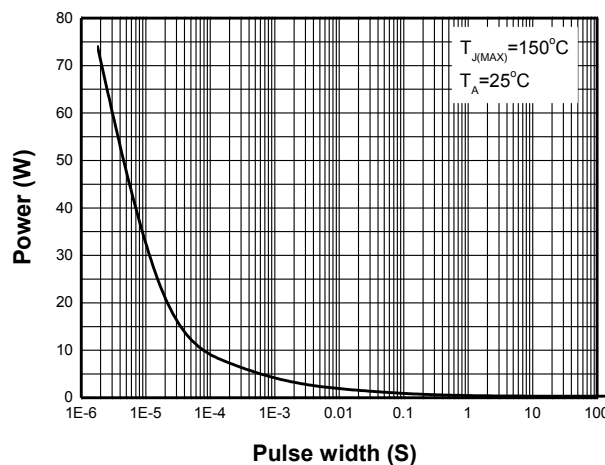
Electronics Characteristics (Ta=25°C, unless otherwise noted)

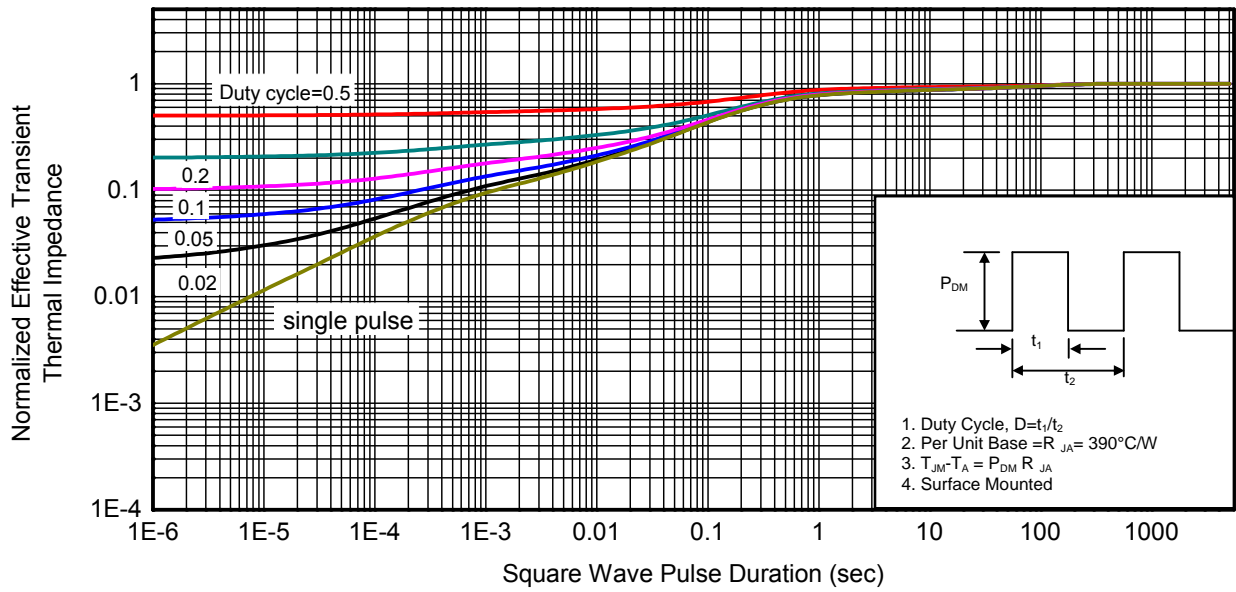
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = -250\mu\text{A}$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
Gate-to-source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 10\text{ V}$			± 5	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\mu\text{A}$	-0.45	-0.7	-1.0	V
Drain-to-source On-resistance	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -1.4\text{ A}$		230	390	m Ω
		$V_{GS} = -2.8\text{ V}, I_D = -0.8\text{ A}$		320	480	
		$V_{GS} = -2.5\text{ V}, I_D = -0.6\text{ A}$		355	620	
		$V_{GS} = -1.8\text{ V}, I_D = -0.5\text{ A}$		650	790	
CHARGES, CAPACITANCES AND GATE RESISTANCE						
Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}, V_{DS} = -15\text{ V}$		104		pF
Output Capacitance	C_{OSS}			25		
Reverse Transfer Capacitance	C_{RSS}			19		
Total Gate Charge	$Q_{G(TOT)}$	$V_{GS} = -4.5\text{ V}, V_{DS} = -10\text{ V}, I_D = -1\text{ A}$		1.1		nC
Threshold Gate Charge	$Q_{G(TH)}$			0.25		
Gate-to-Source Charge	Q_{GS}			0.38		
Gate-to-Drain Charge	Q_{GD}			0.47		
SWITCHING CHARACTERISTICS						
Turn-On Delay Time	$t_d(ON)$	$V_{GS} = -4.5\text{ V}, V_{DS} = -10\text{ V}, R_G = 6\ \Omega, I_D = -1\text{ A}$		7.2		ns
Rise Time	t_r			7.5		
Turn-Off Delay Time	$t_d(OFF)$			18.5		
Fall Time	t_f			10.7		
BODY DIODE CHARACTERISTICS						
Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -0.5\text{ A}$	-0.5	-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

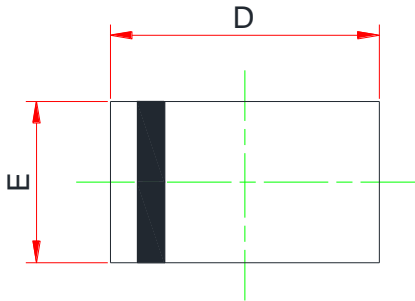
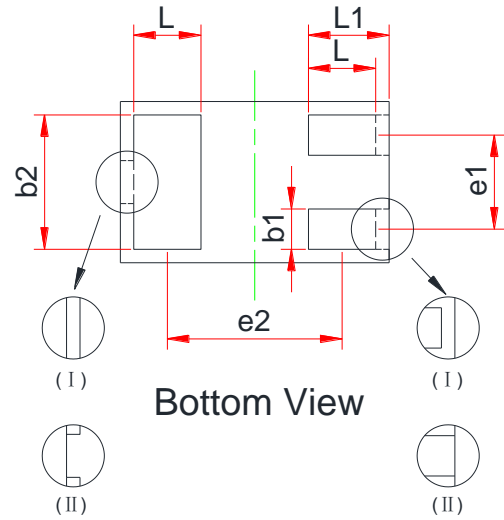
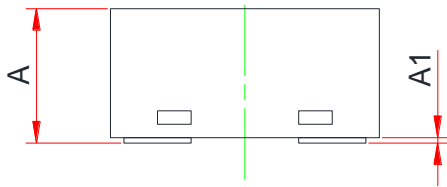

Capacitance

Body diode forward voltage

Gate Charge Characteristics


* V_{GS} > minimum V_{GS} at which $R_{DS(ON)}$ is specified

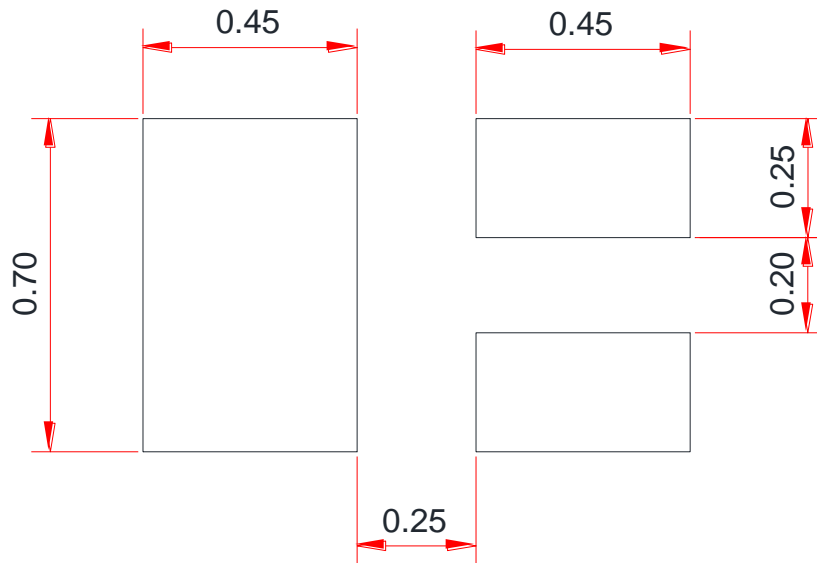
Safe operating power

Single pulse power



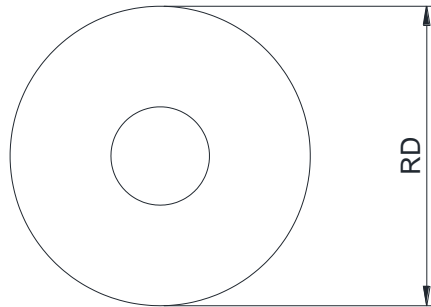
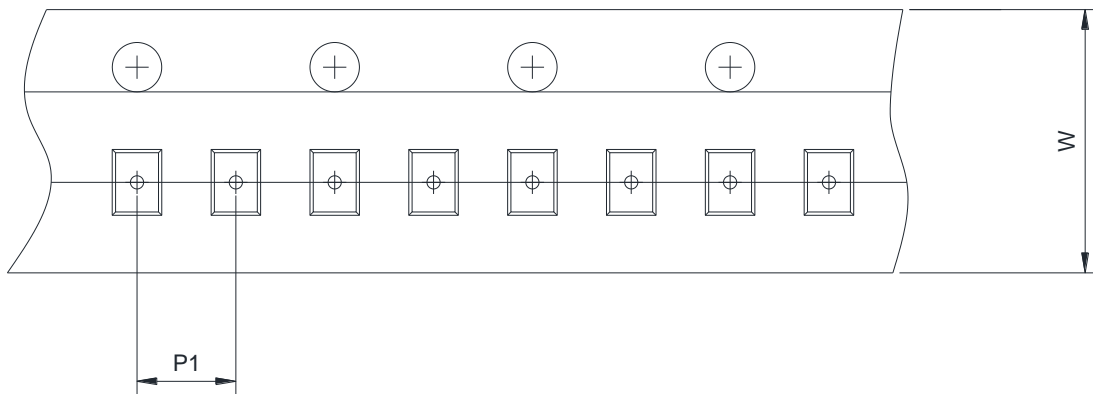
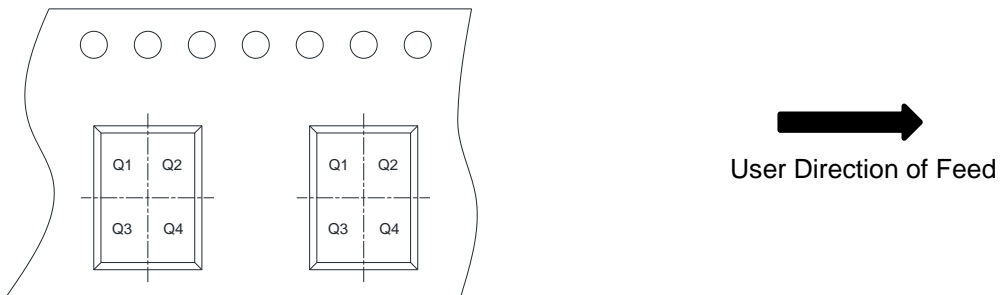
Transient thermal response (Junction-to-Ambient)

Package outline dimensions
DFN1006-3L

Top View

Bottom View

Side View

Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.36	-	0.55
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	0.35 BSC		
e2	0.65 BSC		

Recommended land pattern (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 checked="" type="checkbox"/> 2mm	<input type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input type="checkbox"/> Q1	<input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4