

Description

The PSM6N03R5L uses split gate trench technology to provide excellent $R_{DS(ON)}$ and low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

MOSFET Product Summary

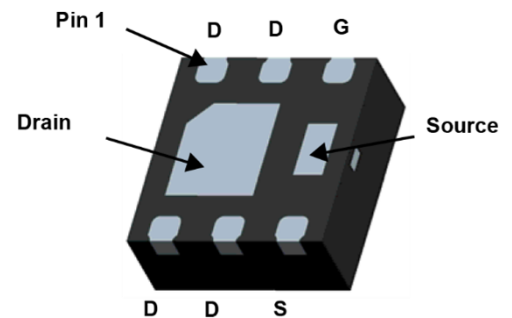
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)(Typ)$	$I_D(A)$
30	3.9@ $V_{GS} = 10V$	25
	5.8@ $V_{GS} = 4.5V$	

Feature

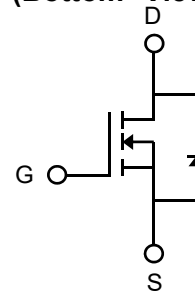
- Low $R_{DS(ON)}$ - Ensures On-State Losses are Minimized
- Excellent $Q_{gd} \times R_{DS(ON)}$ Product(FOM)
- Advanced Technology for DC-DC Converts
- Small Form Factor Thermally Efficient Package
Enables Higher Density End Products
- 100% UIS (Avalanche) Rated
- Lead-Free Finish ; RoHS Compliant
- Halogen and Antimony Free. "Green" Device

Applications

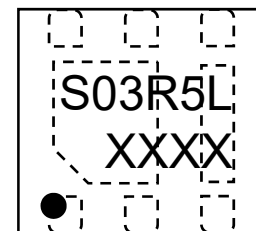
- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers



**DFN2020-6L
(Bottom View)**



Circuit Diagram



Marking (Top View)

Absolute maximum rating@25°C

Rating		Symbol	Value	Units
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous ¹⁾	$T_C = 25^\circ C$	I_D	25	A
	$T_C = 100^\circ C$		16	
Pulsed Drain Current ²⁾		I_{DM}	100	A
Total Power Dissipation ³⁾		P_D	4.9	W
Avalanche Current ⁴⁾		I_{AS}	38	A
Avalanche Energy ⁴⁾		E_{AS}	72.5	mJ
Thermal Resistance , Junction-to-Case ⁵⁾		$R_{\theta JC}$	20.3	$^\circ C/W$
Thermal Resistance Junction-to-Ambient ⁶⁾		$R_{\theta JA}$	56	$^\circ C/W$
Junction and Storage Temperature Range		T_J, T_{STG}	-55~+150	$^\circ C$

Electrical characteristics per line@25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V,I _D = 250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V,V _{GS} = 0V	-	-	1.0	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V,V _{DS} = 0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} ,I _D = 250μA	1.0	1.5	2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} = 10V,I _D = 10A	-	3.9	5.0	mΩ
		V _{GS} = 4.5V,I _D = 10A	-	5.8	8.0	
Dynamic Characteristics ⁷⁾						
Input Capacitance	C _{iss}	V _{DS} = 15V,V _{GS} = 0V, f = 1.0MHz	-	962	-	pF
Output Capacitance	C _{oss}		-	256	-	
Reverse Transfer Capacitance	C _{rss}		-	13	-	
Switching Characteristics ⁷⁾						
Turn-on Delay Time	t _{d(on)}	V _{DS} = 15V, V _{GS} = 10V, R _G = 10Ω, I _D = 20A	-	4.3	-	ns
Turn-on Rise Time	t _r		-	5.3	-	
Turn-Off Delay Time	t _{d(off)}		-	26.1	-	
Turn-Off Fall Time	t _f		-	14.6	-	
Total Gate Charge	Q _g	V _{DS} = 15V, V _{GS} = 10V, I _D = 10A	-	14.7	-	nC
Gate-Source Charge	Q _{gs}		-	1.8	-	
Gate-Drain Charge	Q _{gd}		-	4.7	-	
Gate Resistance	R _g	f=1MHz, Open Drain	-	1.0	-	Ω
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} = 0V,I _S = 2A	-	0.7	1.2	V

Notes:

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous current depends on the thermal & electro-mechanical application board design.
2. Repetitive Rating: Pulse width limited by maximum junction temperature($T_{J_Max}=150^\circ C$).
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. This single-pulse measurement was taken under the following condition ($L=0.1mH, V_{GS}=10V, V_{DS}=30V$)while it's value is limited by $T_{J_Max}=150^\circ C$.
5. Device mounted on infinite heatsink.
6. Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper pad layout.
7. Guaranteed by design, not subject to production.

Typical Characteristics

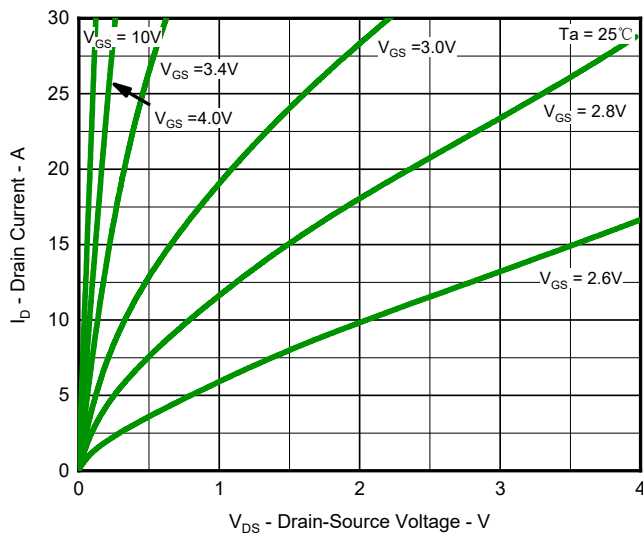


Fig.1 Output Characteristics

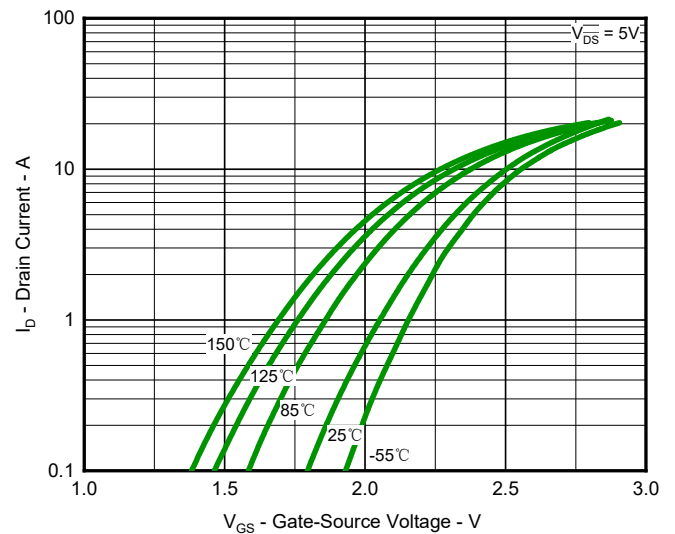


Fig.2 Typical Transfer Characteristic

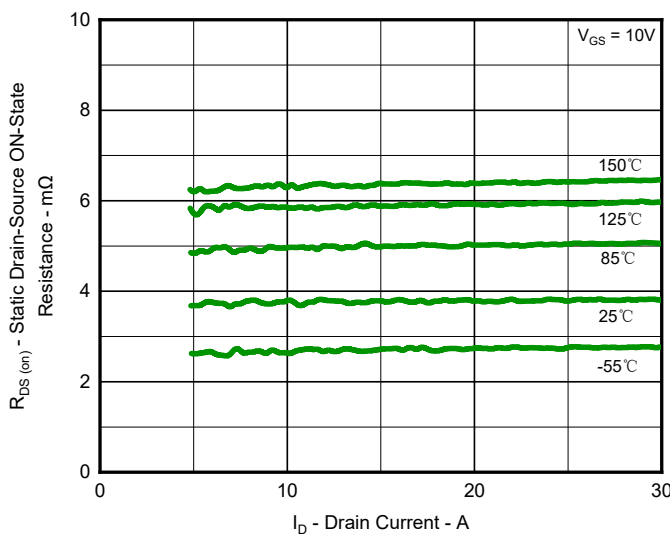


Fig.3 Typical On-Resistance vs Drain Current and Temperature

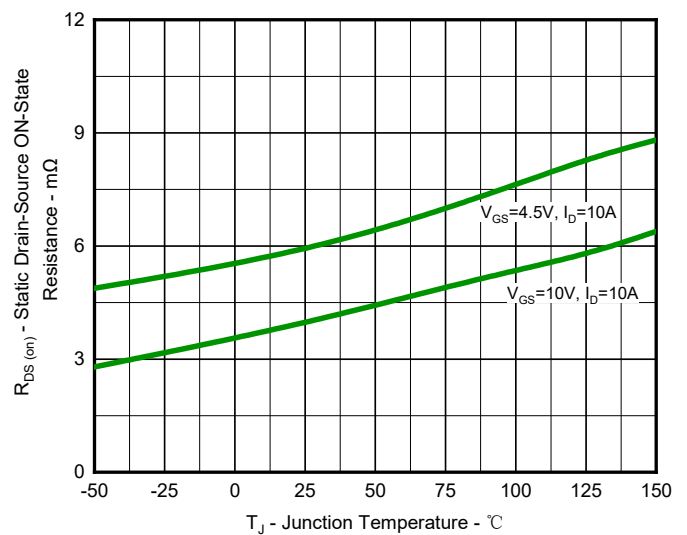


Fig.4 On-Resistance Variation with Temperature

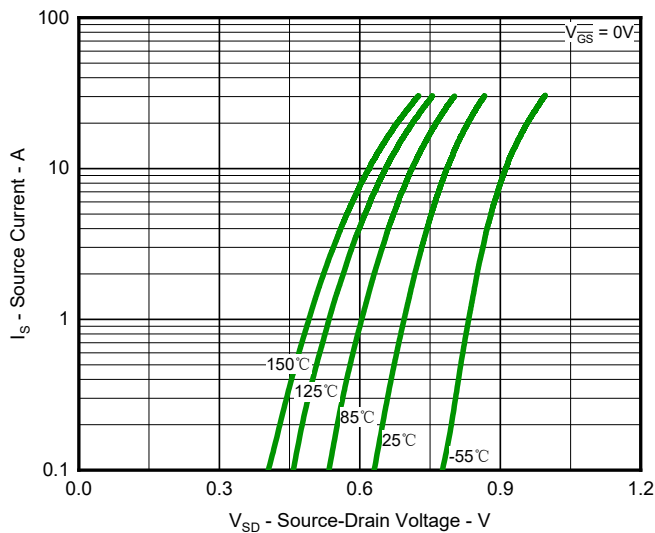


Fig.5 Diode Forward Voltage vs. Current

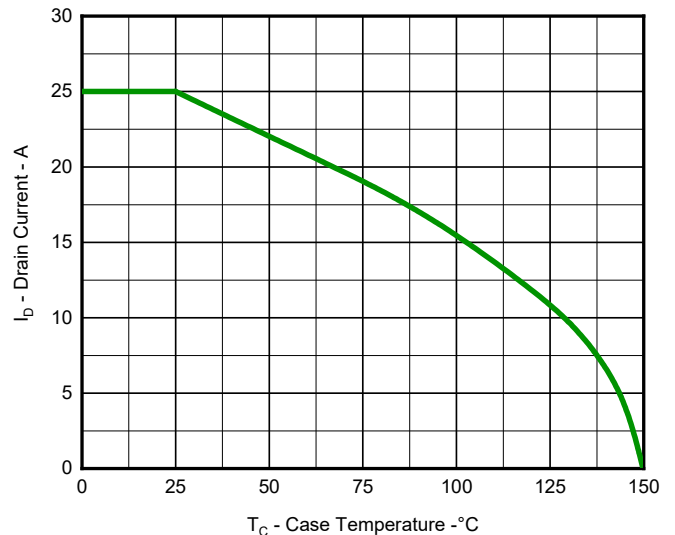


Fig.6 Maximum Drain Current vs. Case Temperature

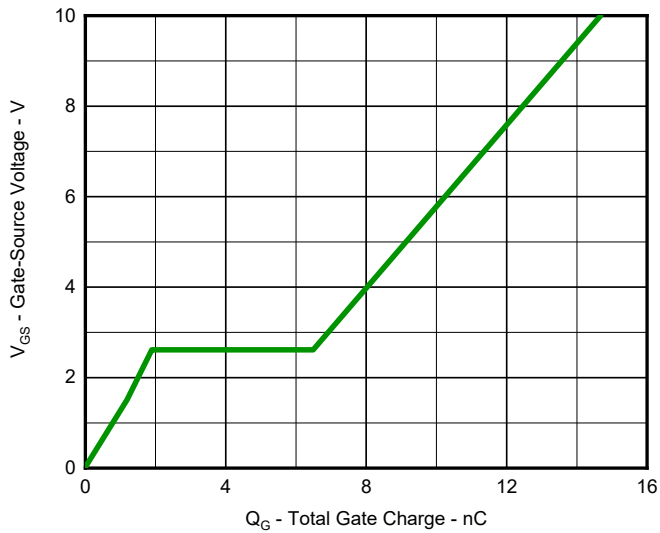


Fig.7 Gate Charge Characteristics

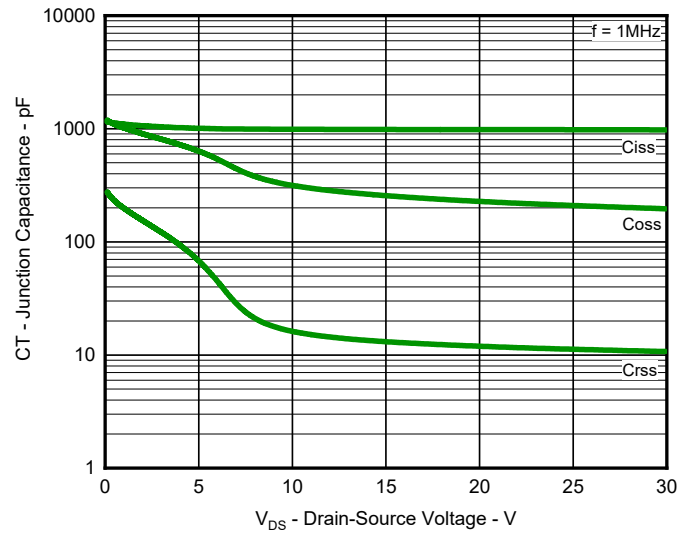


Fig.8 Typical Junction Capacitance

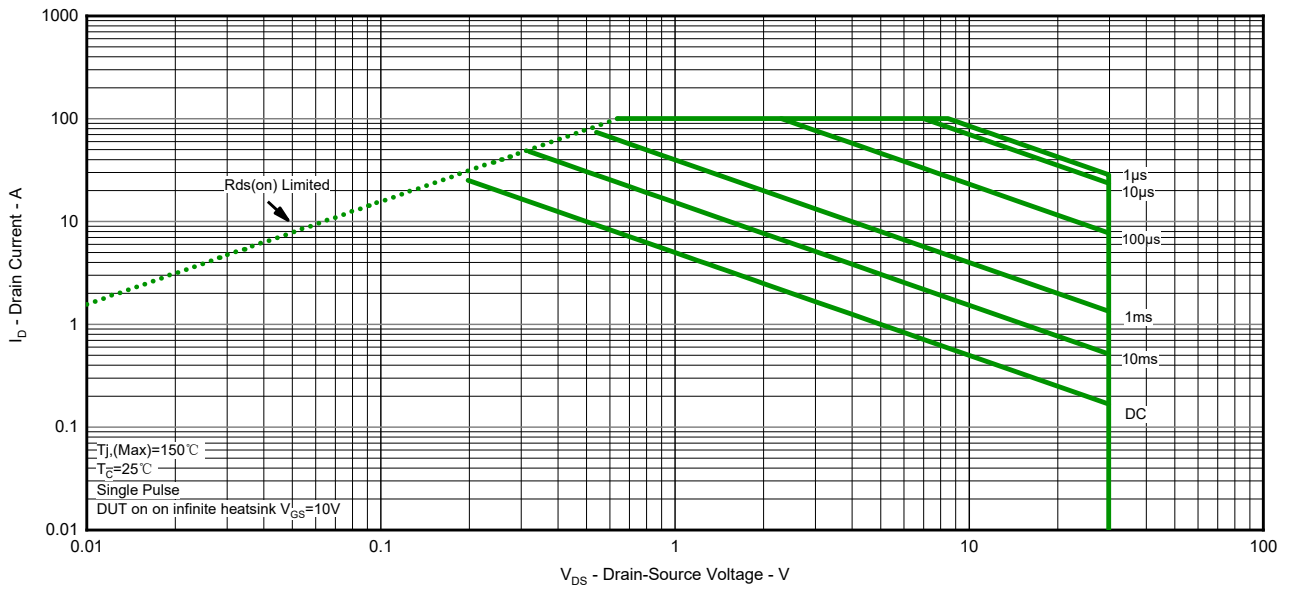


Fig.9 Safe Operation Area

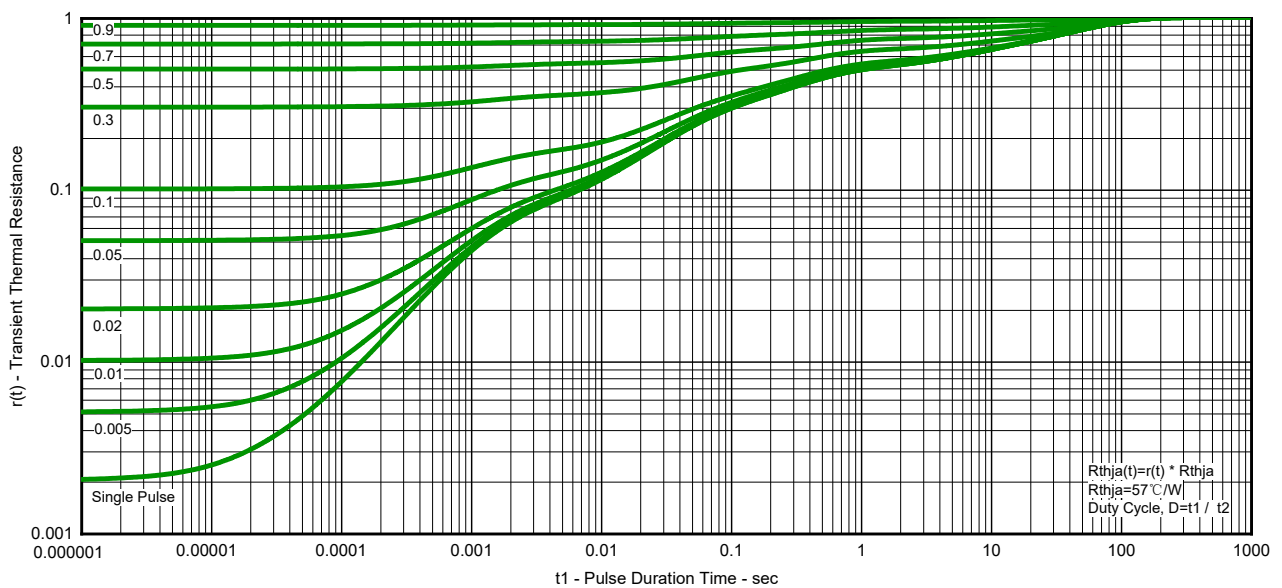
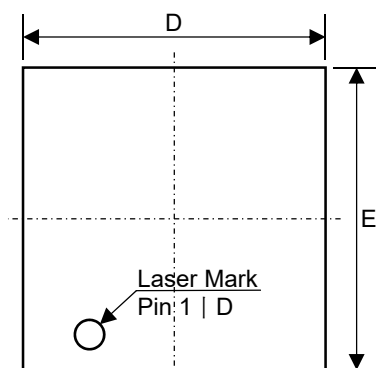
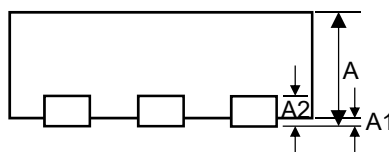


Fig.10 Transient Thermal Resistance

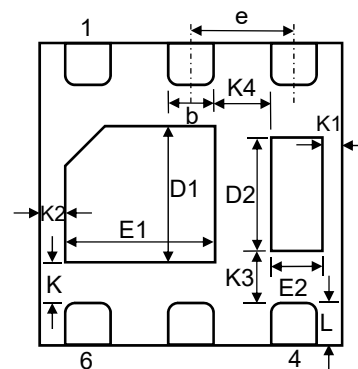
Product Dimension (DFN2020-6L)



Top View

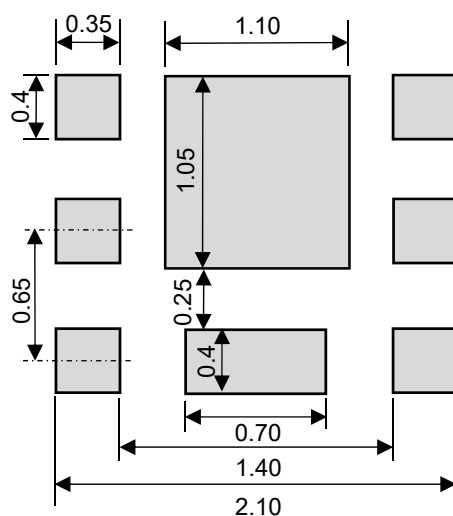


Side View



Bottom View

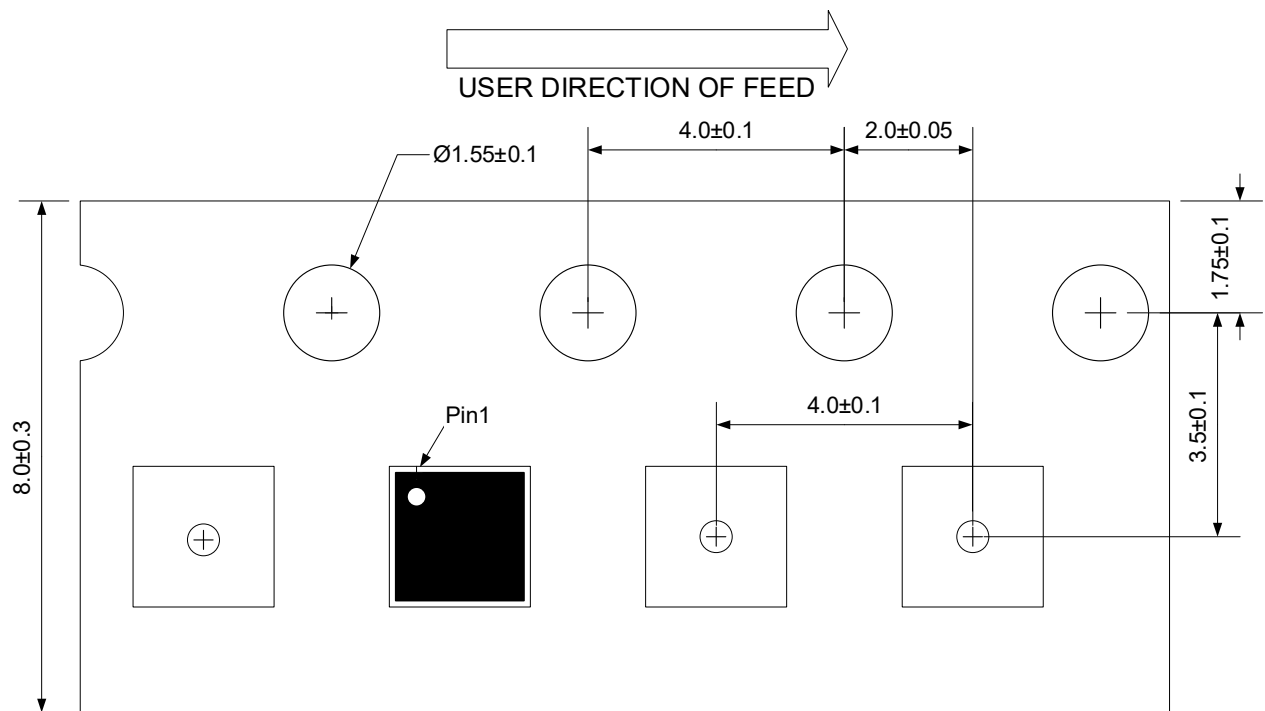
Dim	Millimeters		Inches		Dim	Millimeters		Inches	
	Min	Max	Min	Max		Min	Max	Min	Max
A	0.50	0.60	0.020	0.024	E2	0.25	0.35	0.010	0.014
A1	0.00	0.05	0.000	0.002	e	0.65 Ref.		0.026 Ref.	
A2	0.152 BSC.		0.006 BSC.		L	0.25	0.35	0.010	0.014
b	0.25	0.35	0.010	0.014	K	0.20	0.30	0.008	0.012
D	1.90	2.10	0.075	0.083	K1	0.15	0.25	0.006	0.010
D1	0.80	1.00	0.031	0.039	K2	0.20	0.30	0.008	0.012
D2	0.46	0.66	0.018	0.026	K3	0.42 Ref.		0.017 Ref.	
E	1.90	2.10	0.075	0.083	K4	0.35 Ref.		0.014 Ref.	
E1	0.80	1.00	0.031	0.039					



Unit: mm

Suggested PCB Layout

Load with information



Unit:mm

Ordering information

Package	Reel	Shipping
DFN2020-6L	7"	3000 / Tape & Reel

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