

12V P-Channel Enhancement Mode MOSFET**Description**

The PECN1208DR uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as 1.8V. This device is suitable for use as a load switch or in PWM applications.

General Features

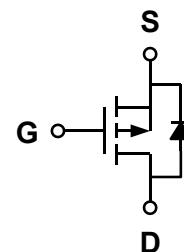
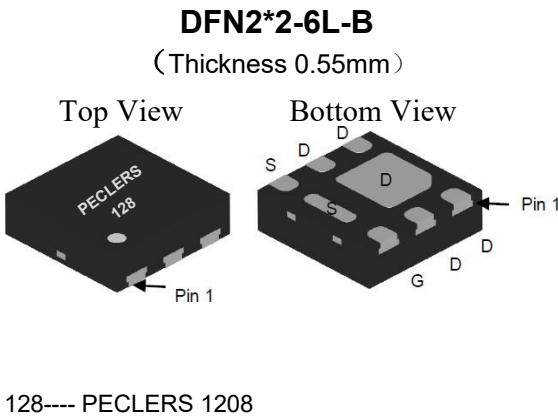
- ◆ $V_{DS} = -12V$, $I_D = -8A$
 $R_{DS(ON)}(\text{Typ.}) = 34m\Omega$ @ $V_{GS} = -2.5V$
 $R_{DS(ON)}(\text{Typ.}) = 28m\Omega$ @ $V_{GS} = -4.5V$
- ◆ High power and current handing capability
- ◆ Lead free product is acquired
- ◆ Surface mount package

Application

- ◆ PWM applications
- ◆ Load switch

Package

- ◆ DFN2*2-6L-B

**Schematic diagram****Marking and pin assignment**

128--- PECLERS 1208

Ordering Information

Part Number	Storage Temperature	Package	Devices Per Reel
PECN1208DR	-55°C to +150°C	DFN2*2-6L-B	4000

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	-12	V
Gate-source voltage	V_{GS}	± 12	V
Drain current-continuous	$T_C = 25^\circ C$	-8 ^a	A
	$T_C = 70^\circ C$	-8 ^a	
	$T_A = 25^\circ C$	-8 ^{a,b,c}	
	$T_A = 70^\circ C$	-6 ^{b,c}	
Drain-source Diode forward current	$T_C = 25^\circ C$	-8 ^a	A
	$T_A = 25^\circ C$	-2.9 ^{b,c}	
Maximum power dissipation	P_D	18	W

	$T_C=70^\circ\text{C}$		12	
	$T_A=25^\circ\text{C}$		3.5 ^{b,c}	
	$T_A=70^\circ\text{C}$		2.2 ^{b,c}	
Operating junction Temperature range		T_j	-55—150	°C

Thermal Resistance Ratings

Parameter	Symbol	Typ.	Max.	Unit
Maximum junction-to-ambient ^{b,d}	R_{thJA}	28	36	°C/W
Maximum junction-to-case (drain)	Steady state	5.3	6.5	

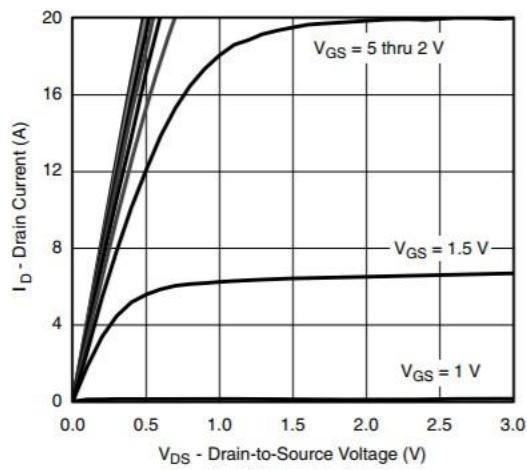
Notes:

- a. Package limited; b. Surface mounted on 1" x 1" FR4 board
 c. t = 5 s; d. Maximum under steady state conditions is 80 °C/W

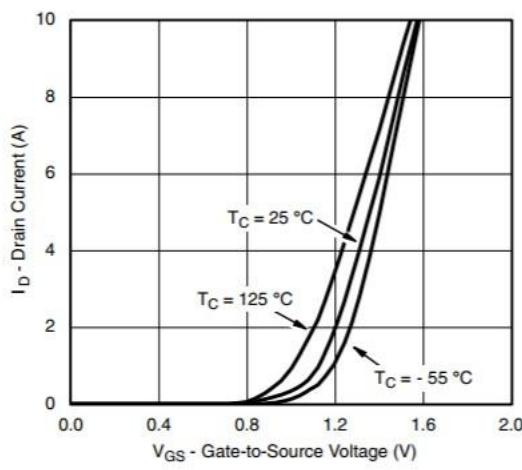
Electrical Characteristics (TA=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
OFF Characteristics						
Drain-source breakdown voltage	BV_{DSS}	$V_{GS}=0\text{V}, I_D=-250\mu\text{A}$	-12	-16.5	-	V
Zero gate voltage drain current	I_{DSS}	$V_{DS}=-12\text{V}, V_{GS}=0\text{V}$	-	-	-1	μA
Gate-body leakage	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 12\text{V}$	-	-	±100	nA
ON Characteristics						
Gate threshold voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu\text{A}$	-0.4	-0.68	-1.2	V
Drain-source on-state resistance	$R_{DS(ON)}$	$V_{GS}=-4.5\text{V}, I_D=-8\text{A}$	-	28	35	mΩ
		$V_{GS}=-2.5\text{V}, I_D=-6\text{A}$	-	34	45	
Forward transconductance	g_{fs}	$V_{GS}=-10\text{V}, I_D=-6.7\text{A}$	-	30	-	S
Dynamic Characteristics						
Input capacitance	C_{iss}	$V_{DS}=-6\text{V}, V_{GS}=0\text{V}$ $f=1.0\text{MHz}$	-	700	-	pF
Output capacitance	C_{oss}		-	280	-	
Reverse transfer capacitance	C_{rss}		-	210	-	
Switching Characteristics						
Turn-on delay time	$t_{D(ON)}$	$V_{DD}=-6\text{V}$ $I_D=-4\text{A}$ $V_{GEN}=-4.5\text{V}$ $R_L=1.2\text{ohm}$ $R_{GEN}=1\text{ohm}$	-	13	-	ns
Rise time	t_r		-	36	-	
Turn-off delay time	$t_{D(OFF)}$		-	32	-	
Fall time	t_f		-	12	-	
Total gate charge	Q_g	$V_{DS}=-6\text{V}, I_D=-4\text{A}$ $V_{GS}=-4.5\text{V}$	-	8.1	-	nC
Gate-source charge	Q_{gs}		-	1.3	-	
Gate-drain charge	Q_{gd}		-	1.7	-	
DRAIN-SOURCE DIODE CHARACTERISTICS						
Diode forward voltage	V_{SD}	$V_{GS}=0\text{V}, I_s=-1.25\text{A}$	-	-0.81	-1.2	V

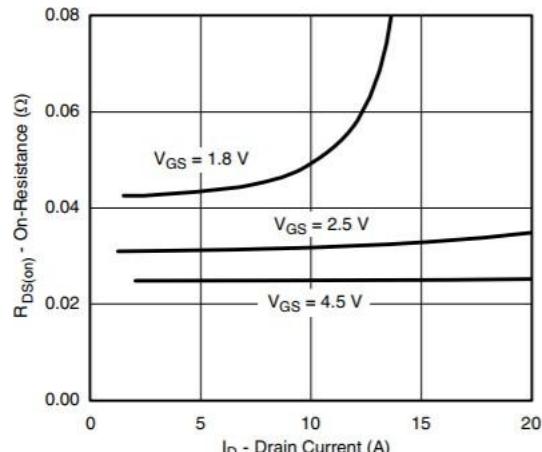
Typical Performance Characteristics



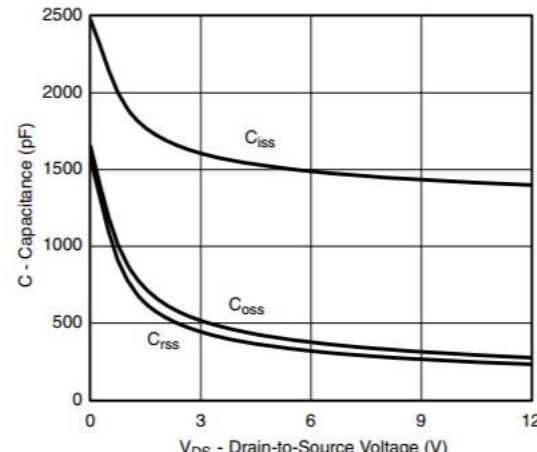
Output Characteristics



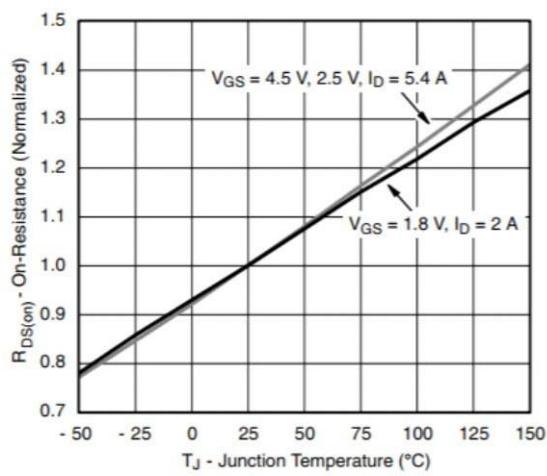
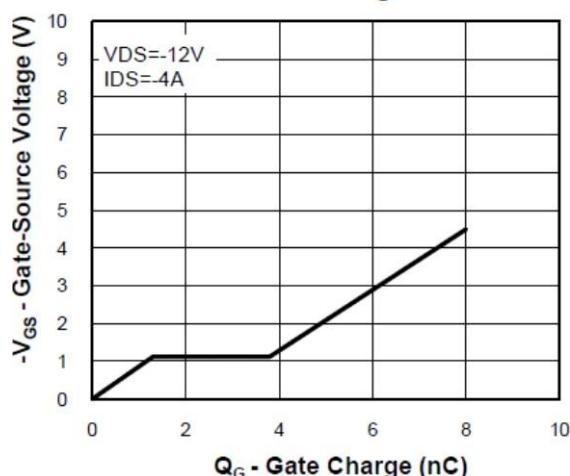
Transfer Characteristics



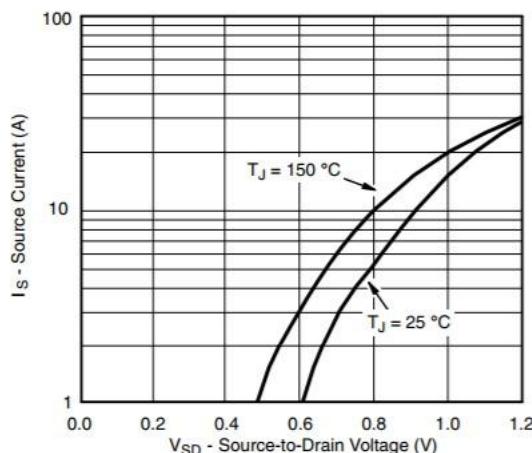
On Resistance vs. Drain Current



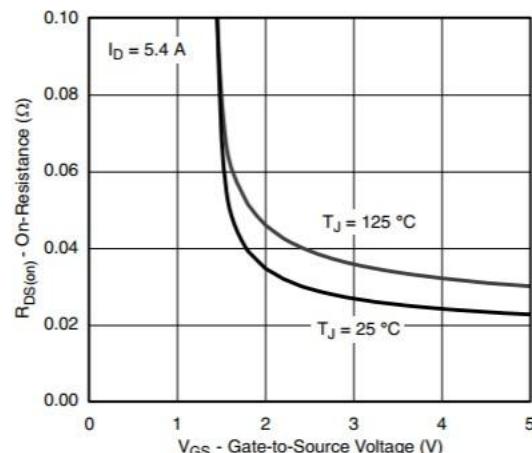
Capacitance



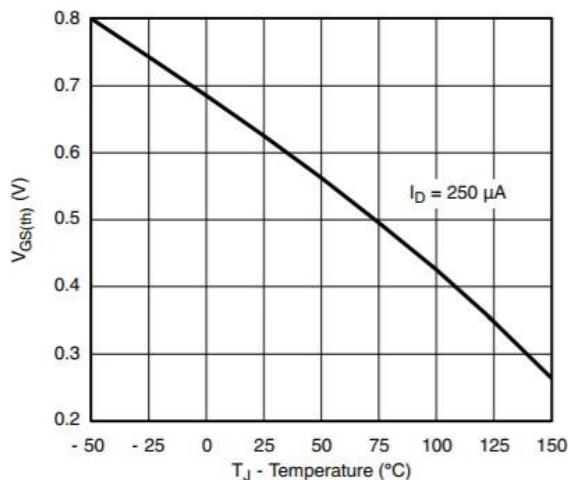
On-Resistance vs. Junction Temperature



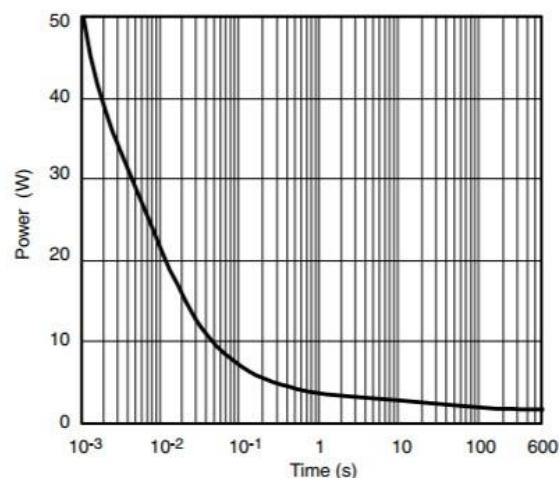
Forward Diode Voltage vs. Temperature



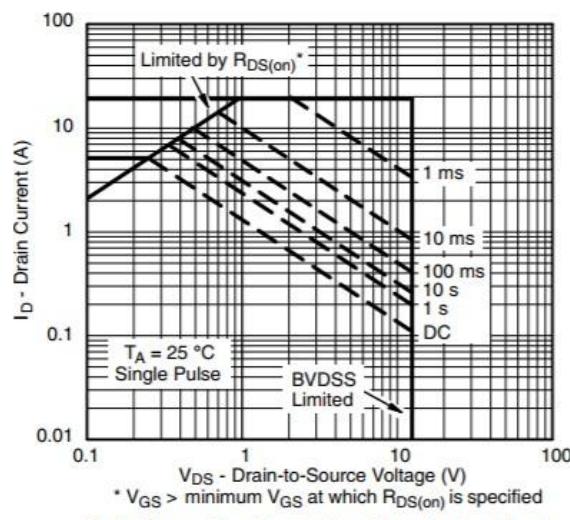
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage

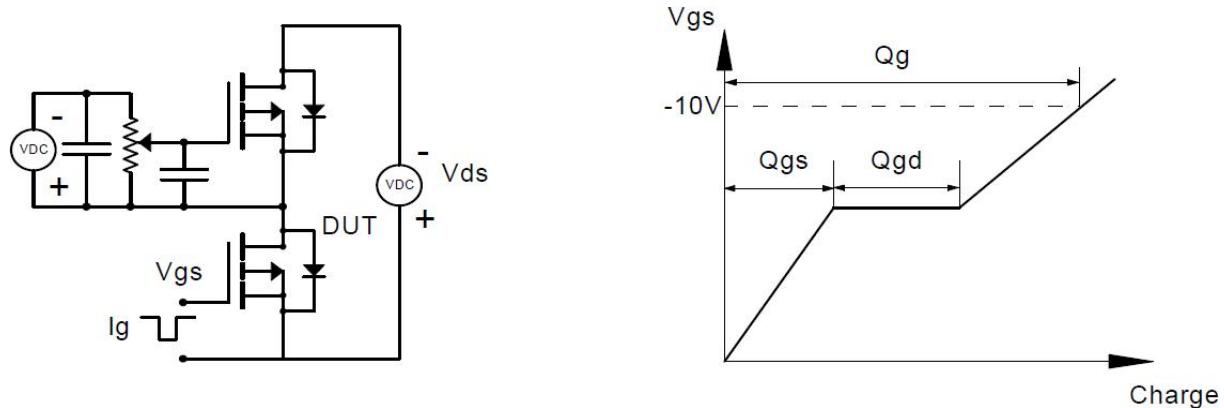


Single Pulse Power

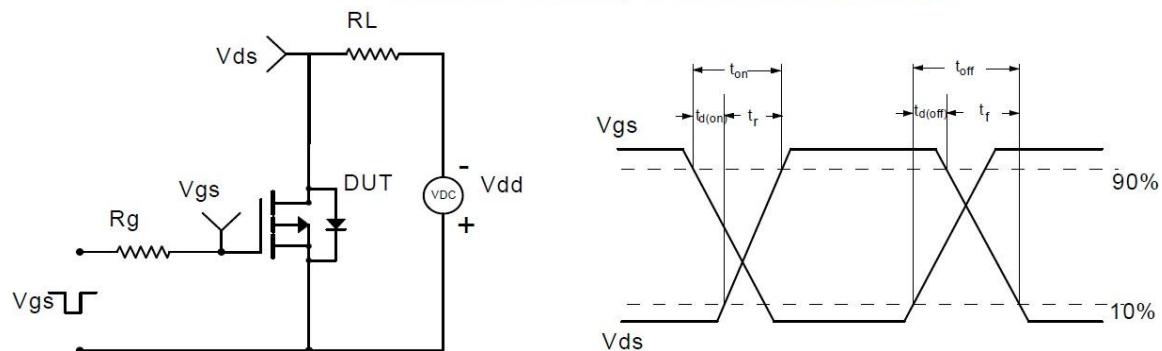


Safe Operating Area, Junction-to-Ambient

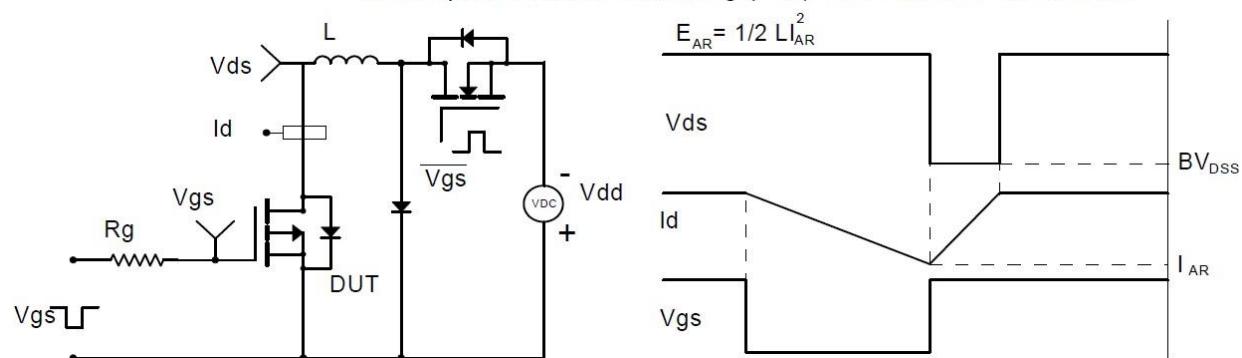
Gate Charge Test Circuit & Waveform



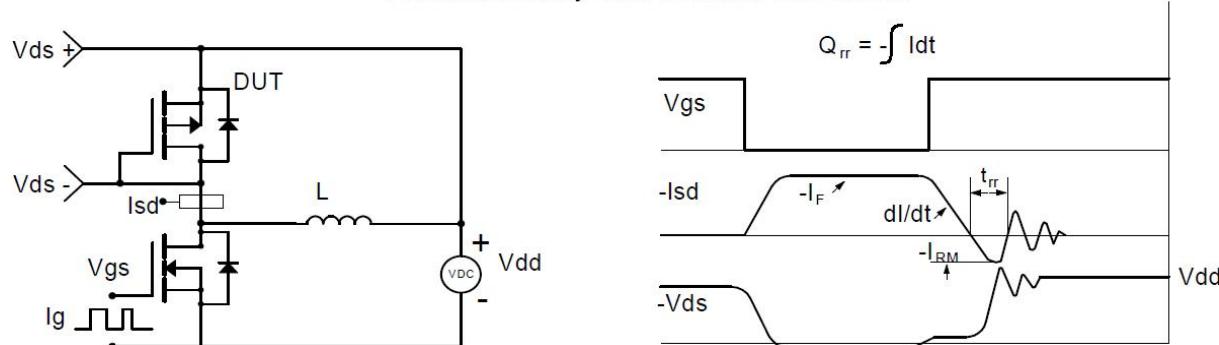
Resistive Switching Test Circuit & Waveforms



Unclamped Inductive Switching (UIS) Test Circuit & Waveforms

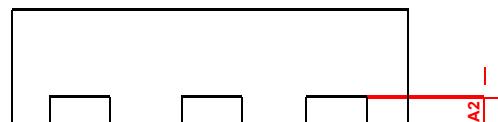


Diode Recovery Test Circuit & Waveforms

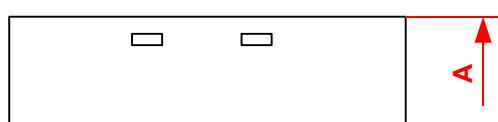


Package Information

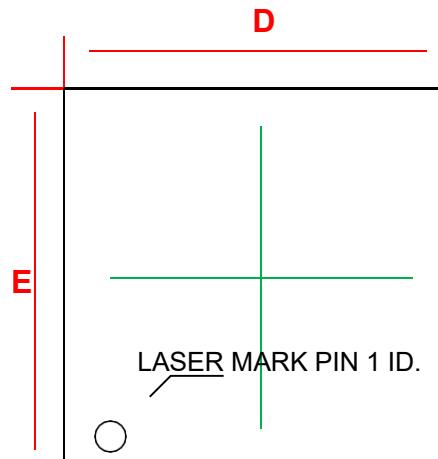
- DFN2*2-6L-B



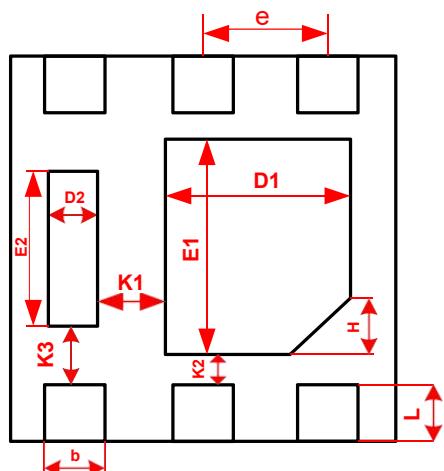
SIDE VIEW



SIDE VIEW



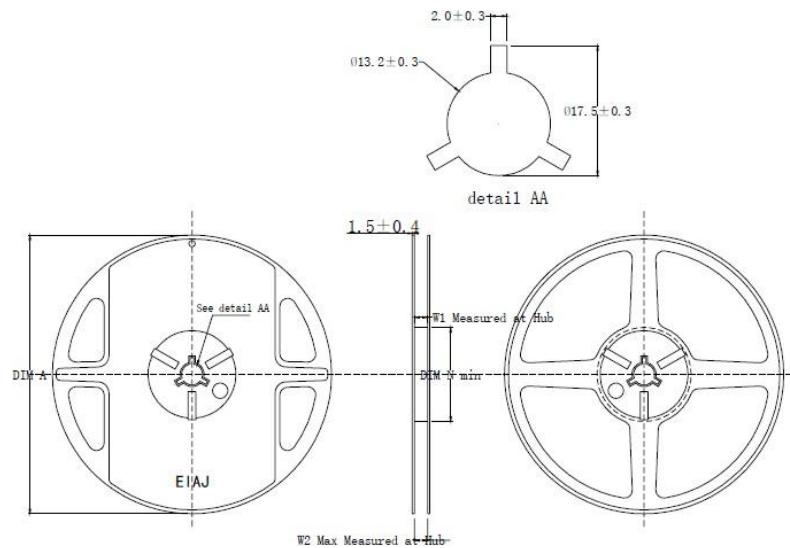
TOP VIEW



BOTTOM VIEW

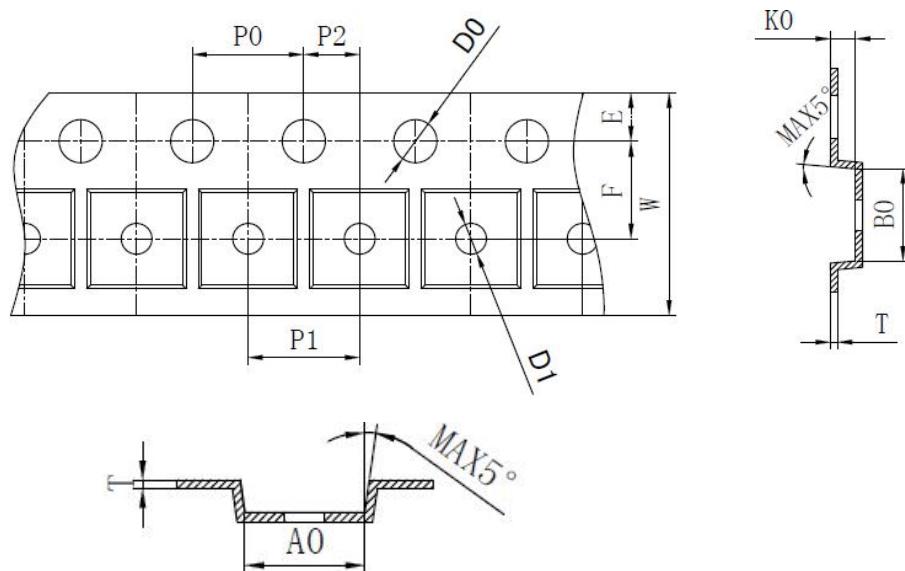
PKG	Common Dimension (mm)		
	DFN2020-6L-B		
SYMBOL	MIN.	MON.	MAX.
A	0.527	0.552	0.577
A2		0.127REF	
b	0.25	0.30	0.35
D	1.90	2.00	2.10
E	1.90	2.00	2.10
D1	0.85	0.95	1.05
E1	1.05	1.15	1.25
D2	0.20	0.25	0.30
E2	0.69	0.79	0.89
e	0.55	0.65	0.75
H	0.25	0.30	0.35
K1	0.25MIN		
K2	0.15MIN		
K3	0.20MIN		
L	0.20	0.25	0.30

Tape and Reel



PRODUCT SPECIFICATIONS

TYPE WIDTH	ϕA	ϕN	W_1 (Min)	W_2 (Max)
8MM	178 ± 2.0	60 ± 1.0	8.4	11.4
12MM	178 ± 2.0	60 ± 1.0	12.4	15.4



SYMBOL	A0	B0	K0	P0	P1	P2
SPEC	2.20 ± 0.05	2.20 ± 0.05	0.75 ± 0.10	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05
SYMBOL	T	E	F	D0	D1	W
SPEC	0.20 ± 0.03	1.75 ± 0.10	3.50 ± 0.05	1.55 ± 0.05	$1.00_{-0}^{+0.10}$	$8.00_{-0.10}^{+0.20}$