



-30V P-Channel Enhancement Mode MOSFET

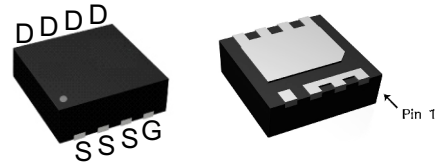
Features

- 30V/-50A,
 $R_{DS(ON)} = 9.5m\Omega(\text{max.}) @ V_{GS} = -10V$
 $R_{DS(ON)} = 16m\Omega(\text{max.}) @ V_{GS} = -4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available
(RoHS Compliant)
- HBM ESD protection level pass 2KV

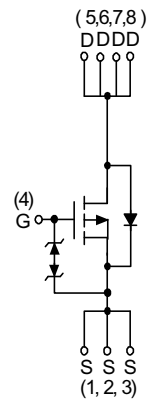
Applications

- Power Management in Notebook Computer,
Portable Equipment and Battery Powered
Systems.

Pin Description



DFN3x3-8



P Channel MOSFET



Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
Common Ratings			
V_{DSS}	Drain-Source Voltage	-30	V
V_{GSS}	Gate-Source Voltage	± 25	
T_J	Maximum Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	-55 to 150	
I_S	Diode Continuous Forward Current	$T_C=25^\circ\text{C}$ -5	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$ -50	
		$T_C=100^\circ\text{C}$ -31	
I_{DM}	Pulsed Drain Current	$T_C=25^\circ\text{C}$ -200	
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$ 35.7	W
		$T_C=100^\circ\text{C}$ 14.3	
R_{qJC}	Thermal Resistance-Junction to Case	Steady State 3.5	$^\circ\text{C/W}$
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$ -17.1	A
		$T_A=70^\circ\text{C}$ -13.7	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$ 4.2	W
		$T_A=70^\circ\text{C}$ 2.7	
R_{qJA}	Thermal Resistance-Junction to Ambient	$t = 10\text{s}$ 30	$^\circ\text{C/W}$
		Steady State 75	
I_{AS}^a	Avalanche Current, Single pulse	$L=0.1\text{mH}$ 38	A
E_{AS}^a	Avalanche Energy, Single pulse	$L=0.1\text{mH}$ 72	mJ

Note a : UIS tested and pulse width are limited by maximum junction temperature 150°C (initial temperature $T_J = 25^\circ\text{C}$).



Electrical Characteristics ($T_A = 25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_{DS}=-250mA$	-30	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-24V, V_{GS}=0V$	-	-	-1	mA
		$T_J=85^\circ\text{C}$	-	-	-30	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_{DS}=-250mA$	-1.3	-1.8	-2.3	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 10	mA
$R_{DS(ON)}^b$	Drain-Source On-state Resistance	$V_{GS}=-10V, I_{DS}=-17.1A$	-	7.5	9.5	m Ω
		$V_{GS}=-4.5V, I_{DS}=-10A$	-	12	16	
Diode Characteristics						
V_{SD}^b	Diode Forward Voltage	$I_{SD}=-1A, V_{GS}=0V$	-	-0.7	-1	V
t_{rr}^c	Reverse Recovery Time	$I_{SD}=-17.1A,$	-	24	-	ns
Q_{rr}^c	Reverse Recovery Charge	$di_{SD}/dt=100A/ns$	-	16	-	
Dynamic Characteristics ^c						
R_g	Gate Resistance	$V_{GS}=0V, V_{DS}=0V, F=1MHz$	-	8	-	W
C_{iss}	Input Capacitance	$V_{GS}=0V,$ $V_{DS}=-15V,$ Frequency=1.0MHz	-	2110	-	pF
C_{oss}	Output Capacitance		-	450	-	
C_{riss}	Reverse Transfer Capacitance		-	330	-	
$t_{d(ON)}$	Turn-on Delay Time	$V_{DD}=-15V, R_L=15W,$ $I_{DS}=-1A, V_{GEN}=-10V,$ $R_G=6W$	-	12	-	ns
t_r	Turn-on Rise Time		-	14	-	
$t_{d(OFF)}$	Turn-off Delay Time		-	98	-	
t_f	Turn-off Fall Time		-	60	-	
Gate Charge Characteristics ^c						
Q_g	Total Gate Charge	$V_{DS}=-15V, V_{GS}=-10V,$ $I_{DS}=-17.1A$	-	45	-	nC
Q_{gs}	Gate-Source Charge		-	5	-	
Q_{gd}	Gate-Drain Charge		-	12.7	-	

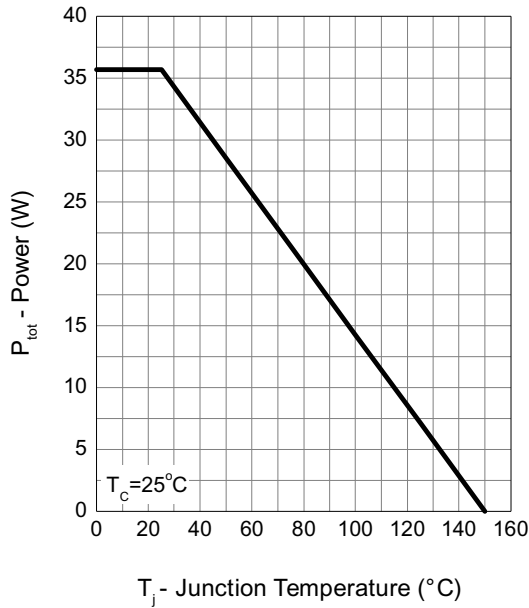
Note b : Pulse test ; pulse width $\geq 300ns$, duty cycle $\geq 2\%$.

Note c : Guaranteed by design, not subject to production testing.

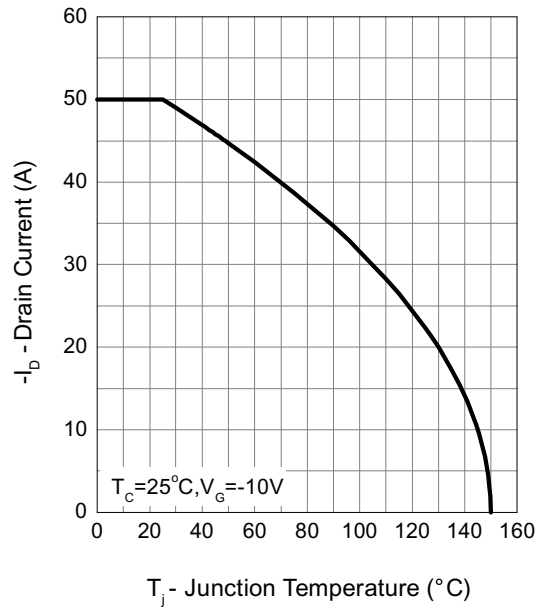


Typical Operating Characteristics

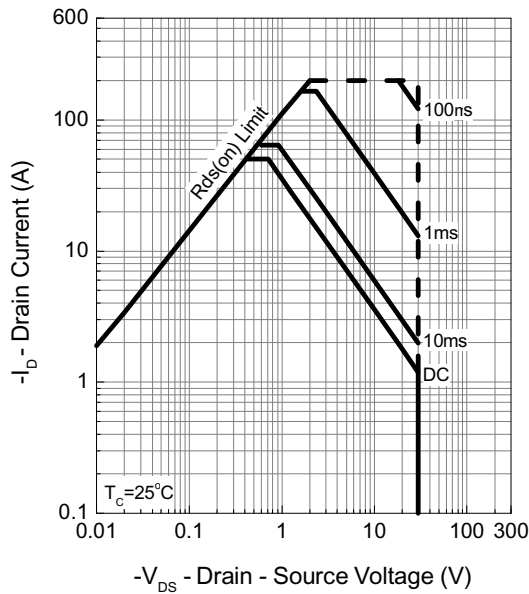
Power Dissipation



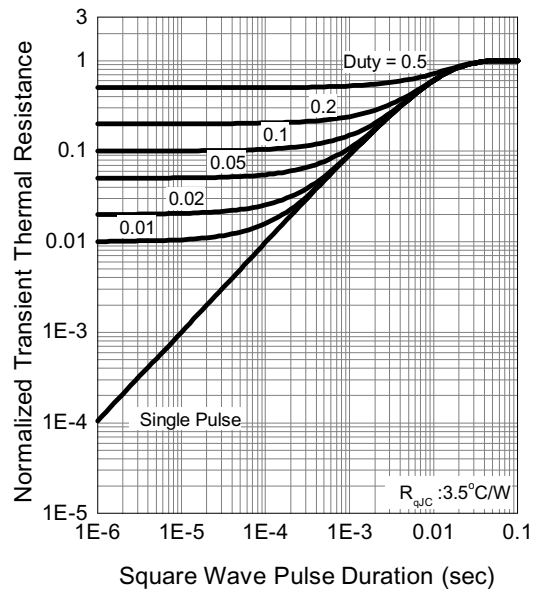
Drain Current



Safe Operation Area



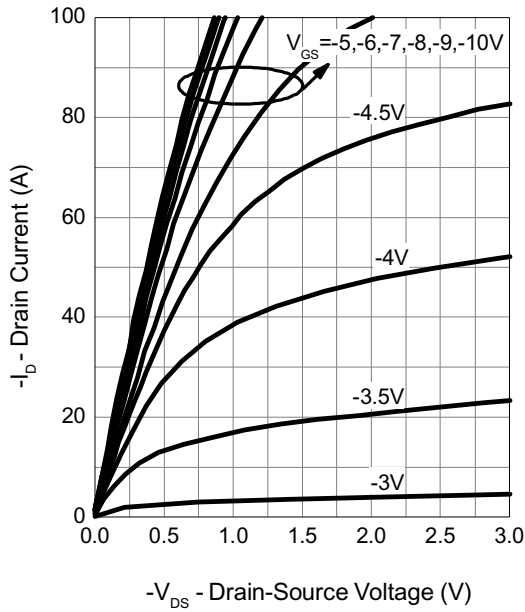
Thermal Transient Impedance



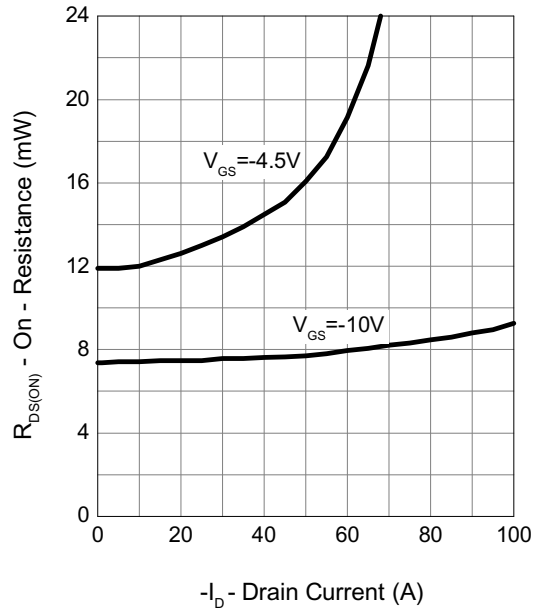


Typical Operating Characteristics (Cont.)

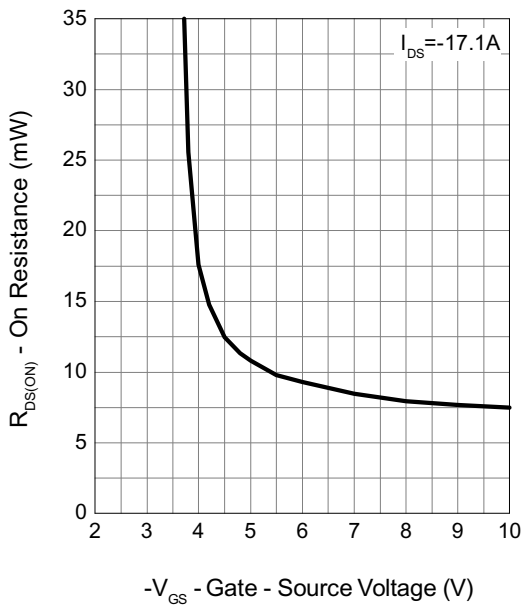
Output Characteristics



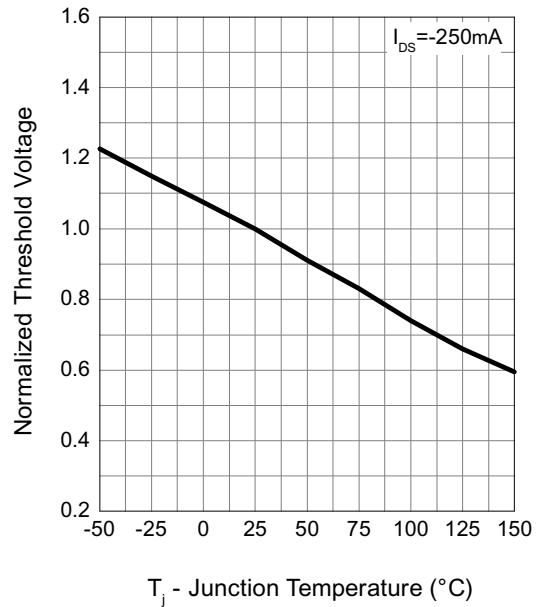
Drain-Source On Resistance



Gate-Source On Resistance



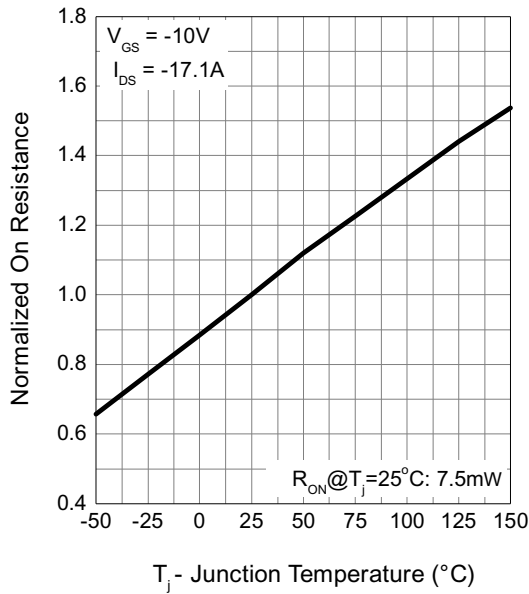
Gate Threshold Voltage



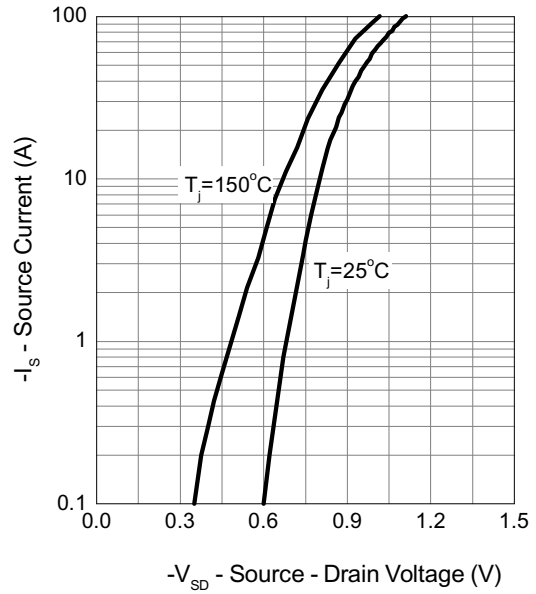


Typical Operating Characteristics (Cont.)

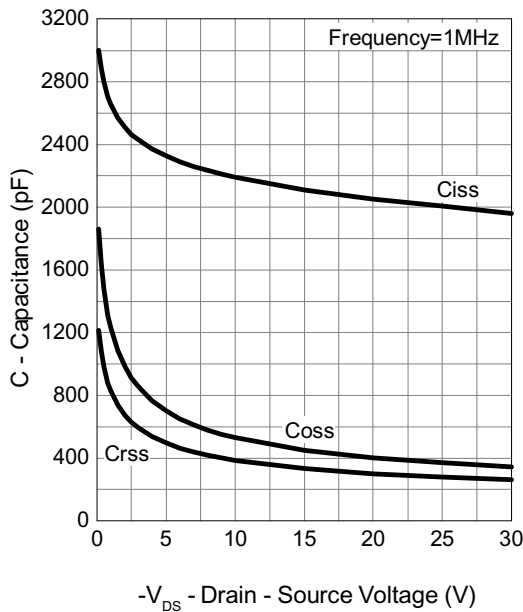
Drain-Source On Resistance



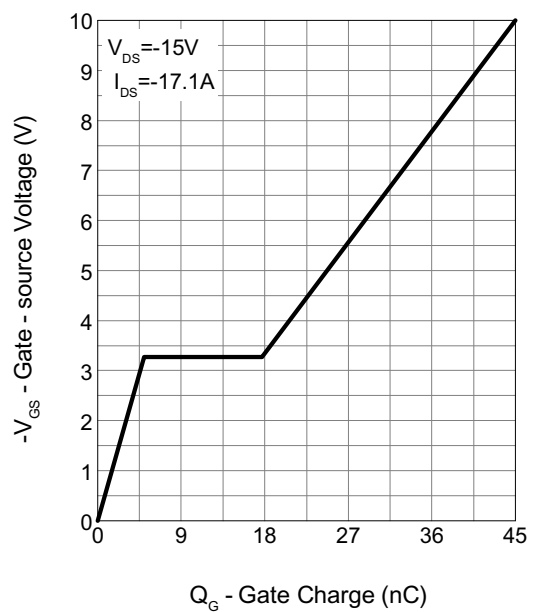
Source-Drain Diode Forward



Capacitance

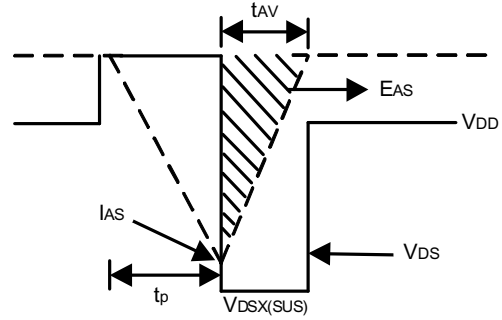
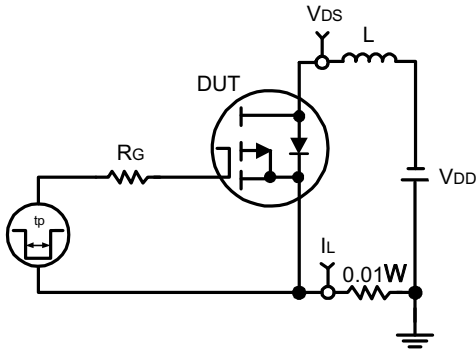


Gate Charge

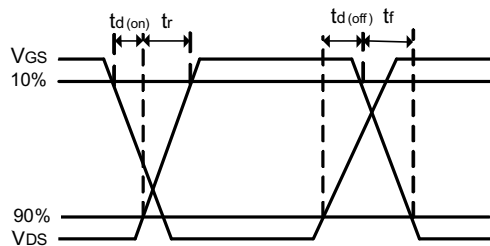
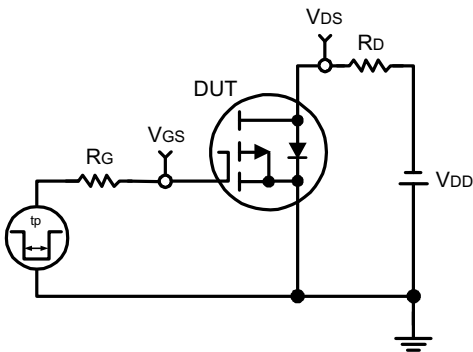




Avalanche Test Circuit and Waveforms



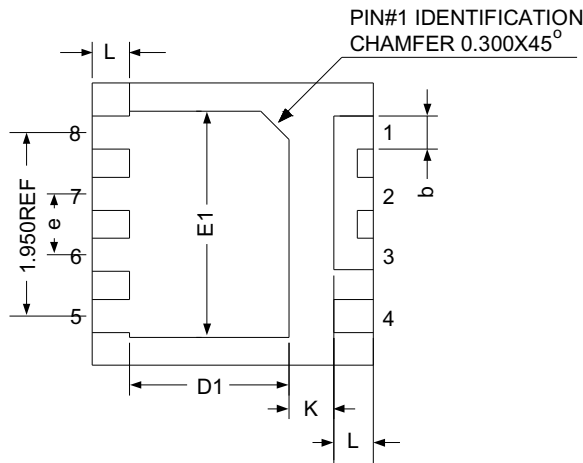
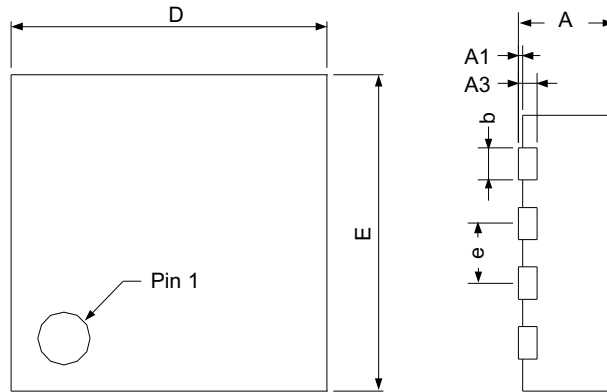
Switching Time Test Circuit and Waveforms





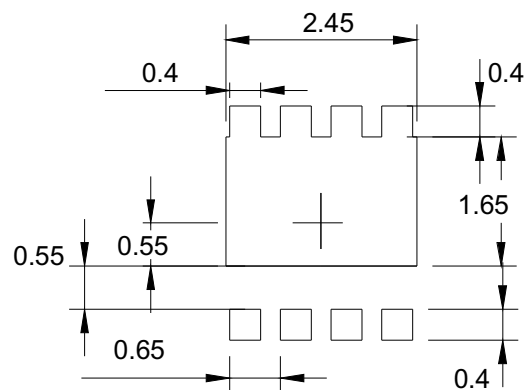
Package Information

DFN3x3-8(saw type)



SYMBOL	DFN3x3-8			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	0.70	1.00	0.028	0.039
A1	0.00	0.05	0.000	0.002
A3	0.203 REF		0.008 REF	
b	0.25	0.40	0.010	0.016
D	2.90	3.10	0.114	0.122
E1	2.25	2.55	0.089	0.1
E	2.90	3.10	0.114	0.122
D1	1.65	1.9	0.065	0.075
e	0.65 BSC		0.026 BSC	
L	0.30	0.50	0.012	0.020
K	0.43	-	0.017	-

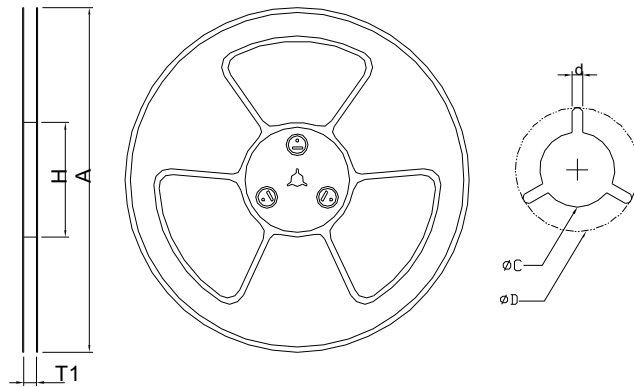
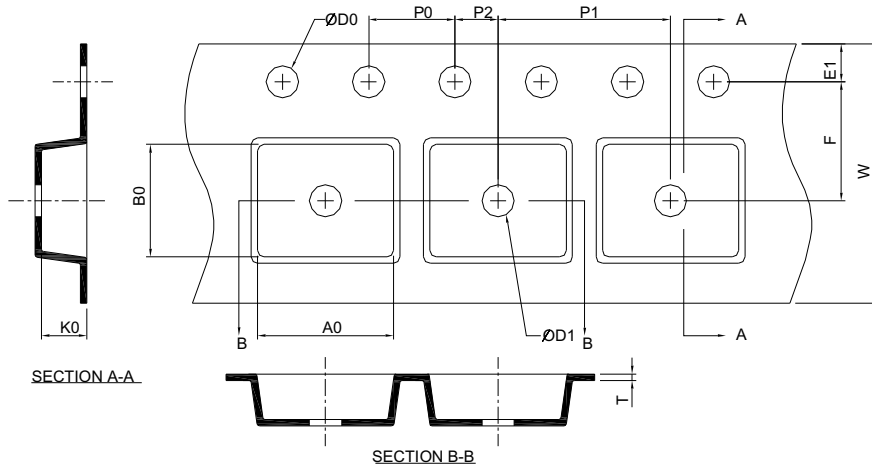
RECOMMENDED LAND PATTERN



UNIT: mm



Carrier Tape & Reel Dimensions



Application	A	H	T1	C	d	D	W	E1	F
DFN3x3-8	330.0±2.00	50 MIN.	12.4+2.00 -0.00	13.0+0.50 -0.20	1.5 MIN.	20.2 MIN.	12.0±0.30	1.75±0.10	5.5±0.05
	P0	P1	P2	D0	D1	T	A0	B0	K0
	4.0±0.10	8.0±0.10	2.0±0.05	1.5+0.10 -0.00	1.5 MIN.	0.6+0.00 -0.40	3.35±0.20	3.35±0.20	1.30±0.20

(mm)