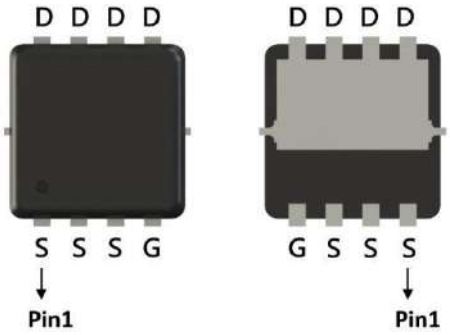
N-Channel Enhancement Mode Power MOSFET

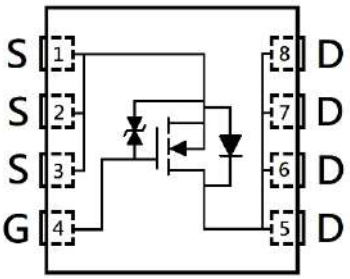
Features:

- Low Gate Charge
- Fast Switching Characteristic
- ESD protected gate

DFN3x3



BV_{DSS}	100V
I_D@V_{GS}=10V, T_C=25°C	14A
I_D@V_{GS}=10V, T_A=25°C	3.8A
$R_{DS(ON)}$ typ.@V_{GS}=10V, I_D=2A	55mΩ



G : Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping
KSPRE050N10KR	DFN3×3 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (T_A=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current @ V_{GS}=10V, T_C=25°C	*a	I_D	14	A
Continuous Drain Current @ V_{GS}=10V, T_C=100°C	*a		9	
Continuous Drain Current @ V_{GS}=10V, T_A=25°C	*b		3.8	
Continuous Drain Current @ V_{GS}=10V, T_A=70°C	*b		3	
Pulsed Drain Current	*c	I_{DM}	35	
Continuous Body Diode Forward Current @ T_C=25°C	*a	I_S	14	
Pulsed Body Diode Forward Current @ T_C=25°C	*a	I_{SM}	35	
Avalanche Current @ L=0.1mH		I_{AS}	8	
Avalanche Energy @ L=0.5mH		E_{AS}	6	mJ
Total Power Dissipation	T_C=25°C *a	P_D	31	W
	T_C=100°C *a		12	
	T_A=25°C *b		2.4	
	T_A=70°C *b		1.5	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55~+150	°C

Thermal Data

Parameter		Symbol	Steady State	Unit
Thermal Resistance, Junction-to-case		$R_{\theta JC}$	4	°C/W
Thermal Resistance, Junction-to-ambient	*b	$R_{\theta JA}$	52	

Note:

*a. The power dissipation P_D is based on $T_{J(MAX)}$=150℃, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

*b. The value of $R_{\theta JA}$ is measured with the device mounted on 1 in^2 FR -4 board with 2 oz. copper, in a still air environment with T_A=25℃. The power dissipation P_D is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150℃. The value in any given application depends on the user's specific board design.

*c. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃. Ratings are based on low frequency and low duty cycles to keep initial T_J=25℃.

Electrical Characteristics (T_A=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	100	-	-	V	V_{GS}=0V, I_D=250μA
$V_{GS(th)}$	2	-	4		V_{DS}=V_{GS}, I_D=250μA
G_{FS}	-	3	-	S	V_{DS}=10V, I_D=2A
I_{GSS}	-	-	±10	μA	V_{GS}=±16V, V_{DS}=0V
I_{DSS}	-	-	1		V_{DS}=80V, V_{GS}=0V
$R_{DS(ON)}$	-	55	75	mΩ	V_{GS}=10V, I_D=2A
Dynamic					
Ciss	-	412	-	pF	V_{DS}=50V, V_{GS}=0V, f=1MHz
Coss	-	68	-		
Crss	-	18	-		
Rg	-	5.7	-	Ω	f=1MHz
Qg *1, 2	-	6.7	-	nC	V_{DS}=50V, I_D=2A, V_{GS}=10V
Qgs *1, 2	-	2	-		
Qgd *1, 2	-	1.2	-		
$t_{d(ON)}$ *1, 2	-	8	-	ns	V_{DS}=50V, I_D=2A, V_{GS}=10V, R_{GS}=1Ω
tr *1, 2	-	16	-		
$t_{d(OFF)}$ *1, 2	-	17	-		
t_f *1, 2	-	14	-		
Source-Drain Diode					
V_{SD} *1	-	0.82	1.2	V	I_S=2A, V_{GS}=0V
trr	-	22	-	ns	I_F=2A, dI_F/dt=100A/μs
Qrr	-	18	-	nC	

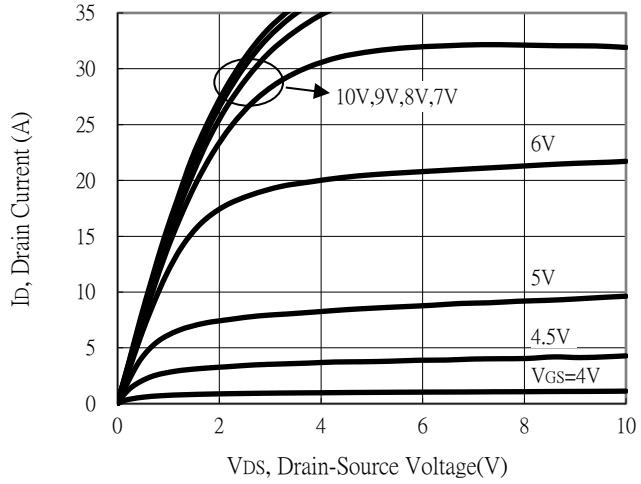
Note:

*1. Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

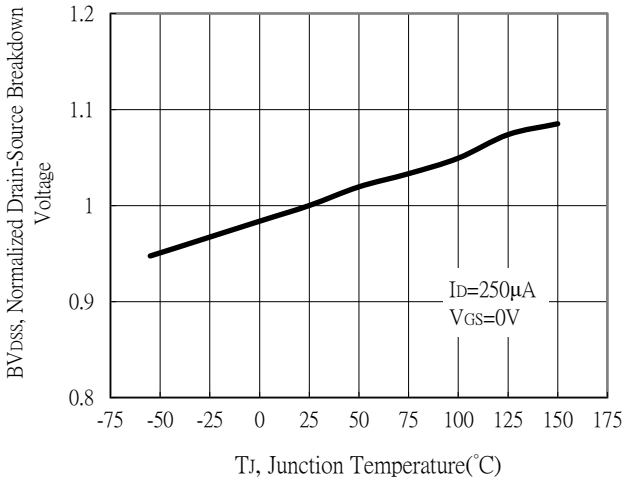
*2. Independent of operating temperature

Typical Characteristics

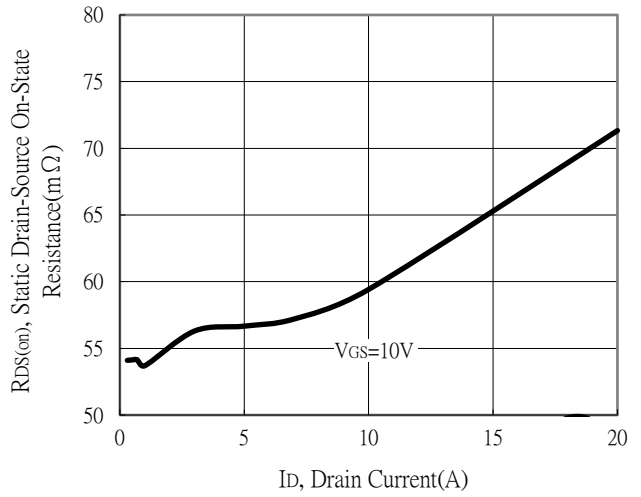
Typical Output Characteristics



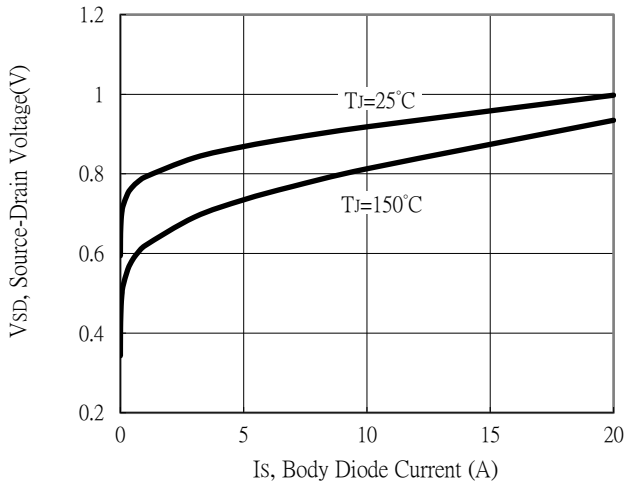
Breakdown Voltage vs Ambient Temperature



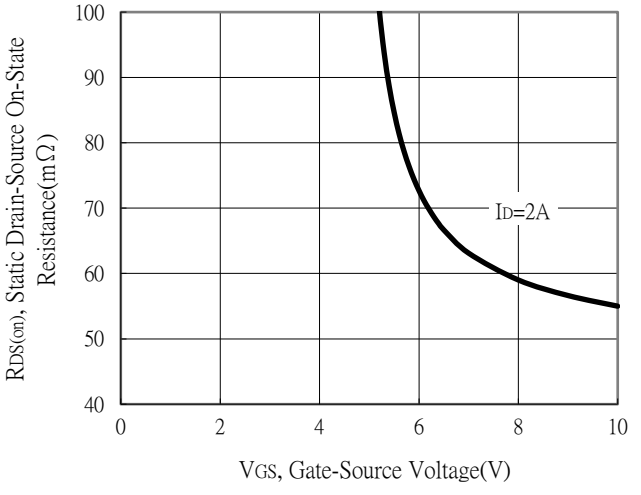
Static Drain-Source On-State resistance vs Drain Current



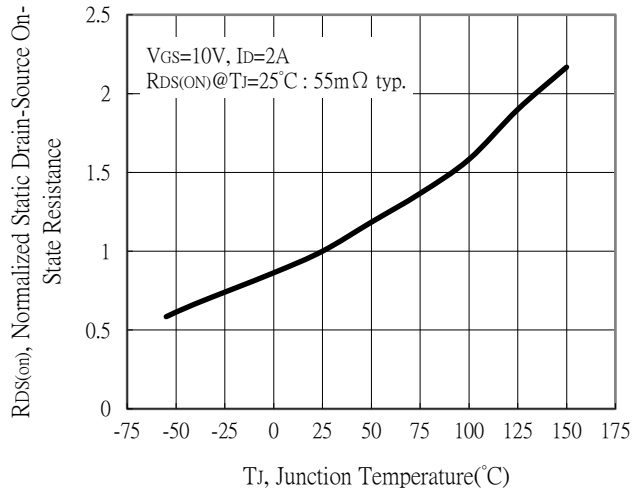
Body Diode Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

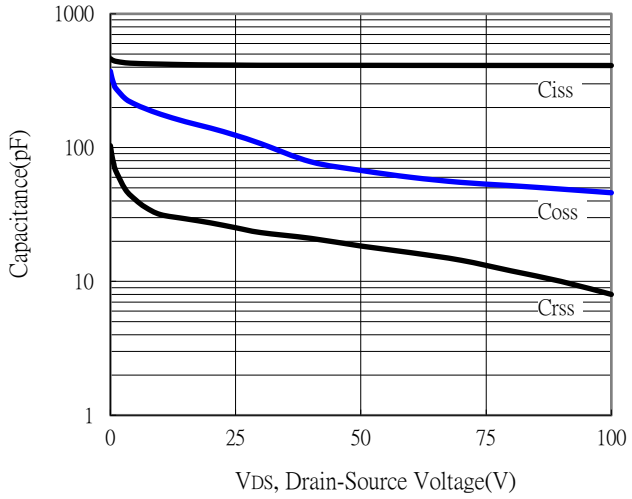


Drain-Source On-State Resistance vs Junction Temperature

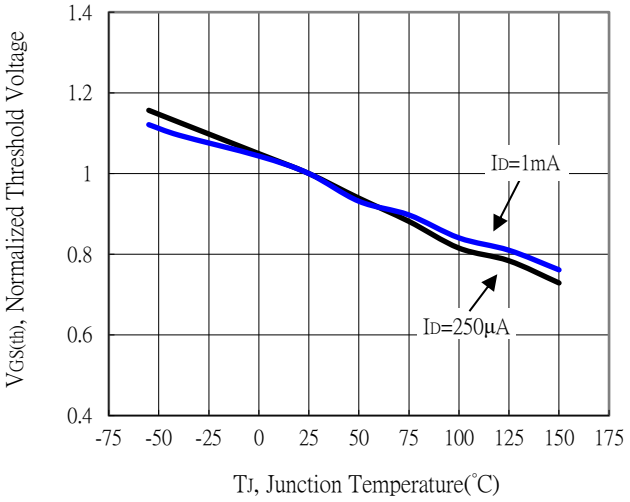


Typical Characteristics (Cont.)

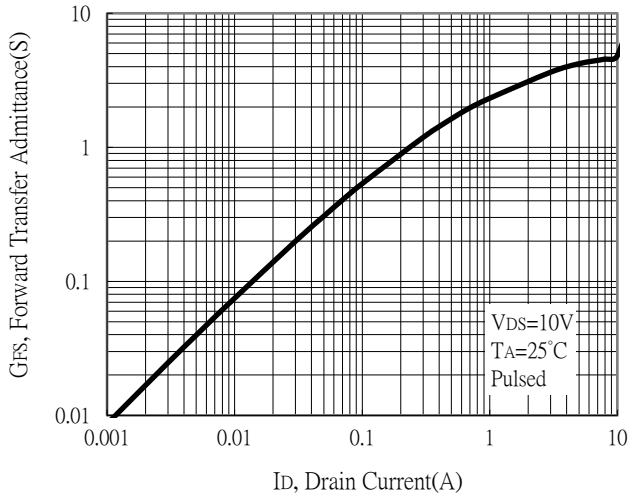
Capacitance vs Drain-to-Source Voltage



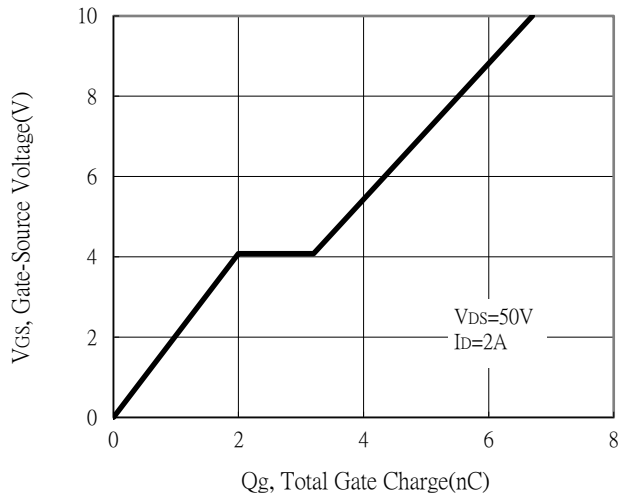
Threshold Voltage vs Junction Temperature



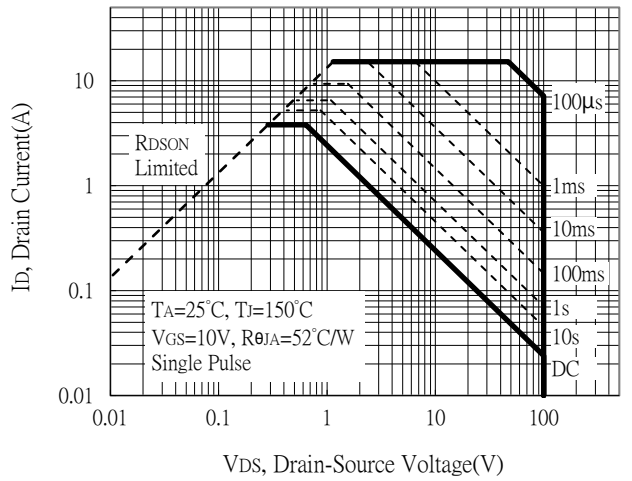
Forward Transfer Admittance vs Drain Current



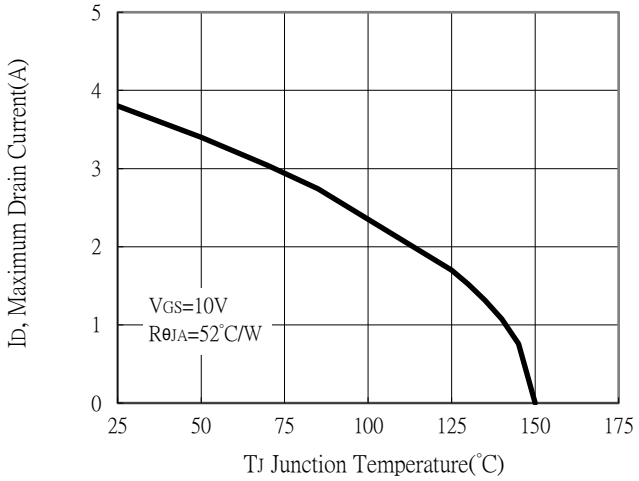
Gate Charge Characteristics



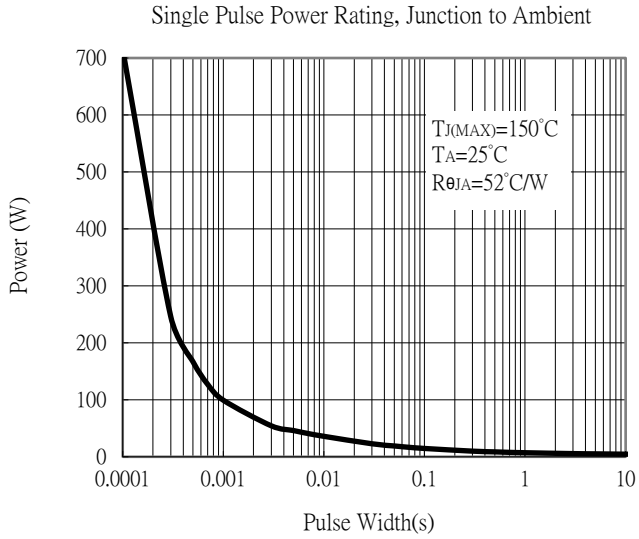
Maximum Safe Operating Area

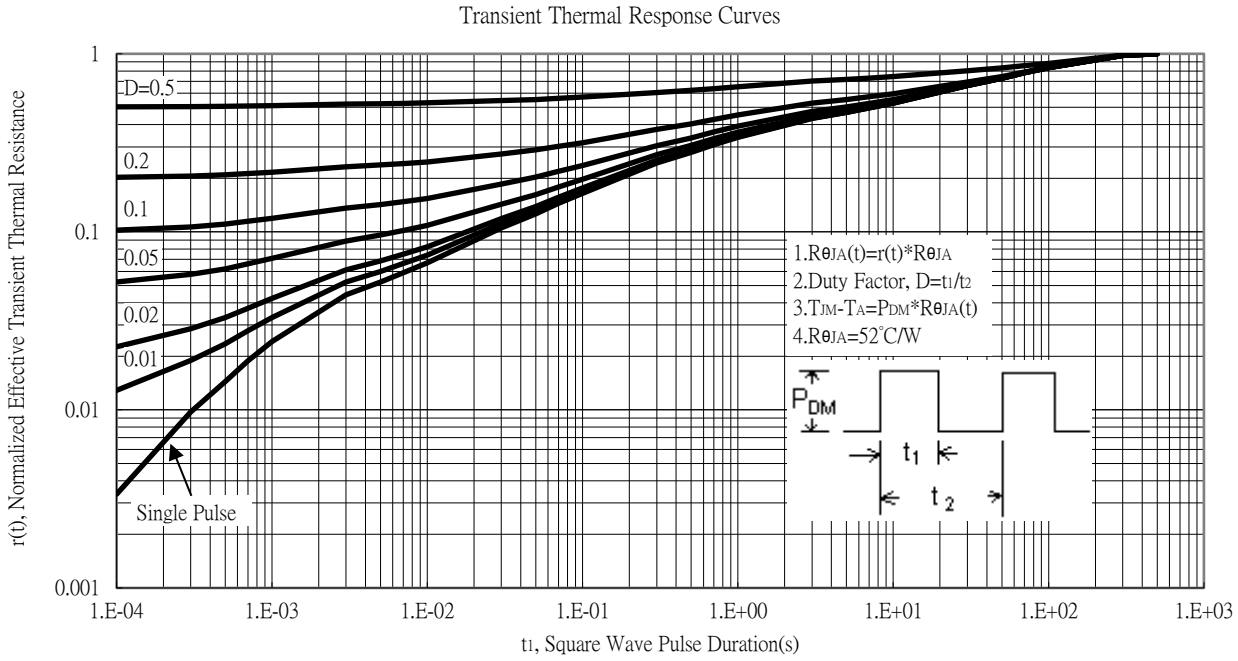


Maximum Drain Current vs Junction Temperature

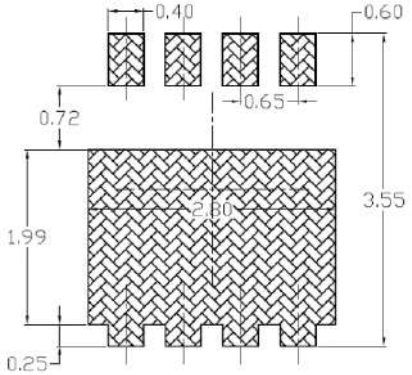


Typical Characteristics (Cont.)



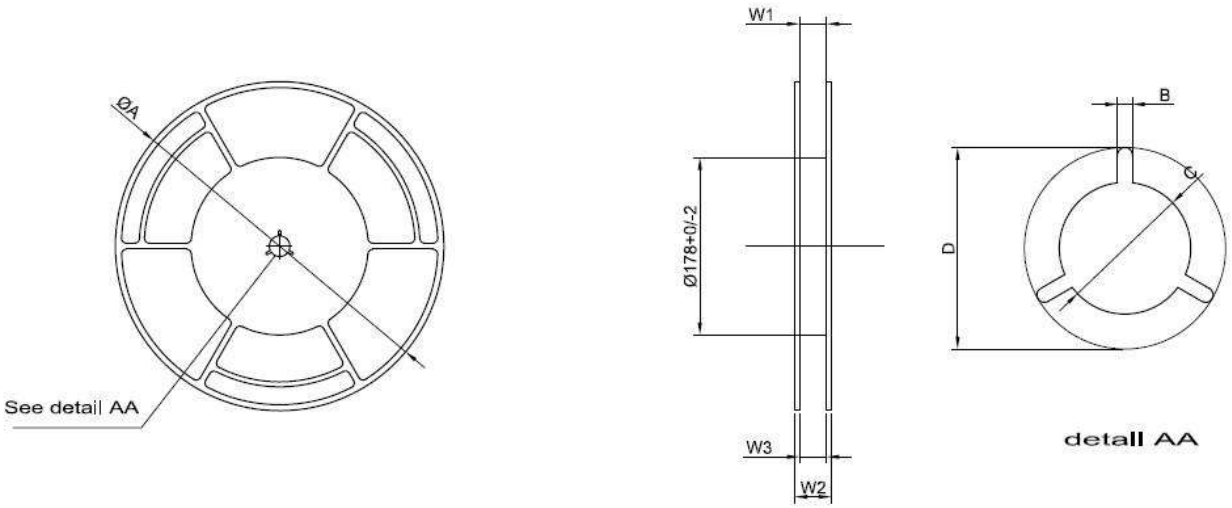


Recommended Soldering Footprint



Unit : mm

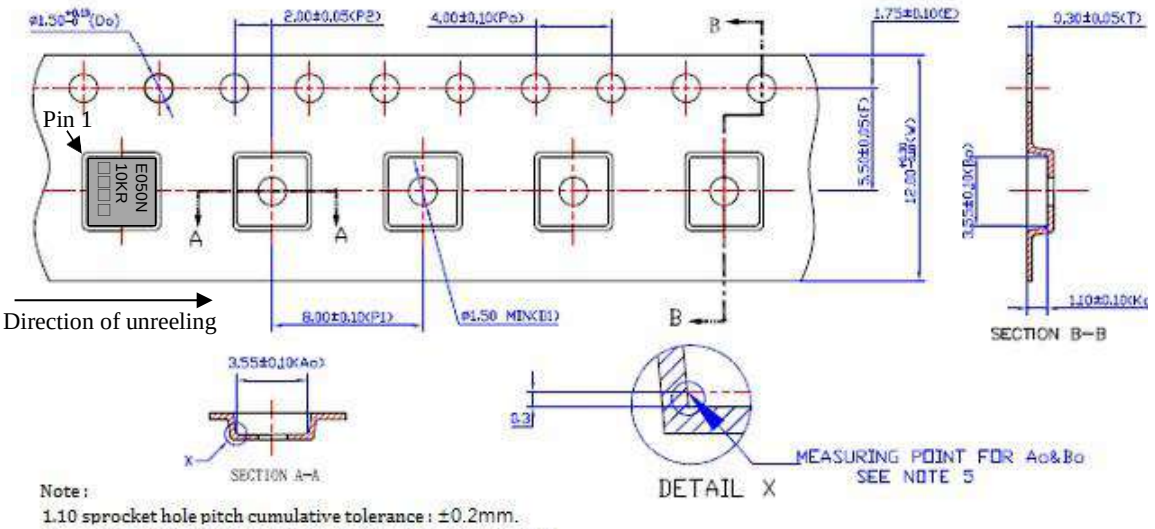
Reel Dimension



TAPE SIZE	A	B	C	D	W1	W2	W3
12mm	330±2.0	2.9±0.5	13.0+0.5/-0	23±1.0	12.4 +2/-0	18.4±0.5	12~15

Unit：mm

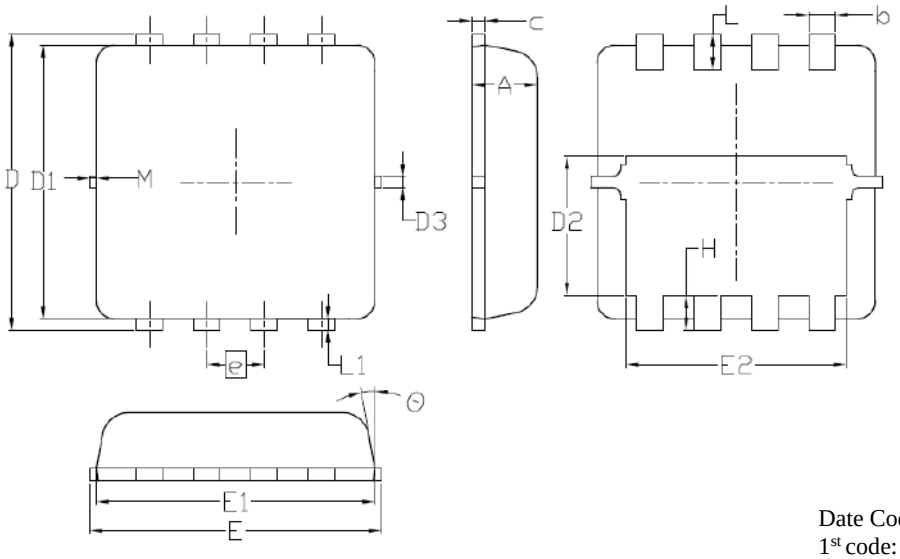
Carrier Tape Dimension



Note:
1.10 sprocket hole pitch cumulative tolerance : ±0.2mm.
2.Camber : Reference to carrier tape inspection manual.
3.Material : black conductive polystyrene.
4.All dimensions are in millimeters(unless otherwise specified).
5.Ao and Bo measured on a plane 0.3mm above the bottom of the pocket.
6.Ko measured from a plane on the inside bottom of the pocket to the top surface of the carrier.
7.Pocket position relative to sprocket hole measured as true position of the pocket, not pocket hole.
8.Surface resistivity : 1×10E4~1×10E11 ohms/sq

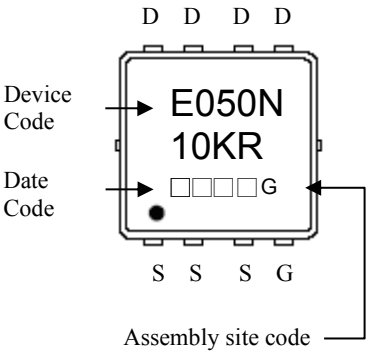
Unit：mm

DFN3x3 Dimension



8-Lead DFN3x3 Plastic Package

Marking:



Date Code(counting from left to right) :
1st code: year code, the last digit of Christian year
2nd code : month code, Jan→A, Feb→B, Mar→C,
Apr→D, May→E, Jun→F, Jul→G, Aug→H,
Sep→J, Oct→K, Nov→L, Dec→M
3rd and 4th codes : production serial number, 01~99

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.70	0.80	0.028	0.031	E1	3.00	3.20	0.118	0.126
b	0.25	0.35	0.010	0.014	E2	2.39	2.59	0.094	0.102
c	0.10	0.25	0.004	0.010	e	0.65 BSC		0.026 BSC	
D	3.25	3.45	0.128	0.136	H	0.30	0.50	0.012	0.020
D1	3.00	3.20	0.118	0.126	L	0.30	0.50	0.012	0.020
D2	1.48	1.68	0.058	0.066	L1	0.13 TYP		0.005 TYP	
D3	0.13 TYP		0.005 TYP		θ	-	12°	-	12°
E	3.00	3.40	0.118	0.134	M	-	0.15	-	0.006