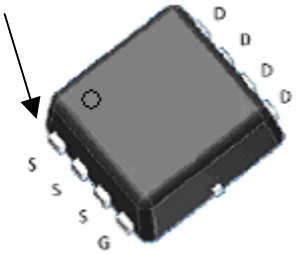
N-Channel Enhancement Mode Power MOSFET

DFN3x3

Features:

- Single Drive Requirement
- Low On-resistance
- Pb-free lead plating package

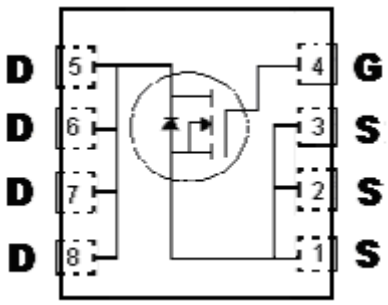
Pin 1



Applications:

- Synchronous rectifier for DC/DC converters
- Telecom secondary side rectification
- High end server/ work station

BV_{DSS}	30V
I_D@V_{GS}=10V, T_A=25°C	12A
I_D@V_{GS}=10V, T_C=25°C	30A
R_{DSON}@V_{GS}=10V, I_D=10A	9 mΩ (typ)
R_{DSON}@V_{GS}=4.5V, I_D=6A	14mΩ (typ)



G：Gate　D：Drain　S：Source

Ordering Information

Device	Package	Shipping
KSPRN4410	DFN3x3 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current @V_{GS}=10V, T_A=25°C	I_D	12	A
Continuous Drain Current @V_{GS}=10V, T_A=70°C		9.6	
Continuous Drain Current @V_{GS}=10V, T_C=25°C		30	
Continuous Drain Current @V_{GS}=10V, T_C=100°C		19	
Pulsed Drain Current	I_{DM}	50 *1	
Total Power Dissipation @ T_A=25°C	P_D	2.5	W
Linear Derating Factor		0.02	W/°C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	8	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	50 *3	

Note : 1. Pulse width limited by maximum junction temperature
2. Surface mounted on 1 in² copper pad of FR-4 board, t≤10s ; 125°C/W when mounted on minimum copper pad.

Characteristics (Tj=25°C, unless otherwise specified)

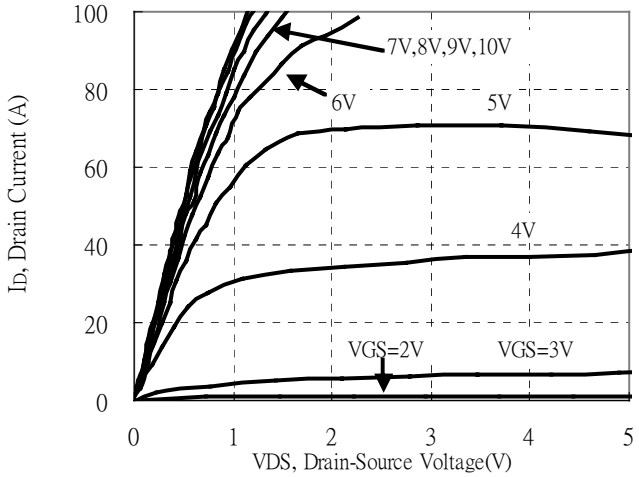
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0V, I_D=250μA
$\Delta BV_{DSS}/\Delta Tj$	-	0.02	-	V/°C	Reference to 25°C, I_D=1mA
$V_{GS(th)}$	1.0	1.6	3.0	V	V_{DS} = V_{GS}, I_D=250μA
G_{FS}	-	20	-	S	V_{DS} =10V, I_D=10A
I_{GSS}	-	-	±100	nA	V_{GS}=±20V
I_{DSS}	-	-	1	μA	V_{DS} =30V, V_{GS} =0V
I_{DSS}	-	-	25		V_{DS} =24V, V_{GS} =0V, Tj=55°C
*$R_{DS(ON)}$	-	9	13.5	mΩ	V_{GS} =10V, I_D=10A
*$R_{DS(ON)}$	-	14	20		V_{GS} =4.5V, I_D=6A
Dynamic					
*Qg	-	16	-	nC	I_D=10A, V_{DS}=15V, V_{GS}=5V
*Qgs	-	3.8	-		
*Qgd	-	6.2	-		
*$t_{d(ON)}$	-	7.5	-	ns	V_{DS}=25V, I_D=1A, V_{GS}=5V, R_G=3.3Ω , R_D=25Ω
*tr	-	17	-		
*$t_{d(OFF)}$	-	36	-		
*t_f	-	15	-		

Ciss	-	1119	-	pF	V_{GS}=0V, V_{DS}=15V, f=1MHz
Coss	-	124	-		
Crss	-	105	-		
Source-Drain Diode					
*V_{SD}	-	-	1.3	V	I_S=2.3A, V_{GS}=0V
*I_S	-	-	2.3	A	V_D=V_G=0V, V_S=1.3V
*I_{SM}	-	-	50		

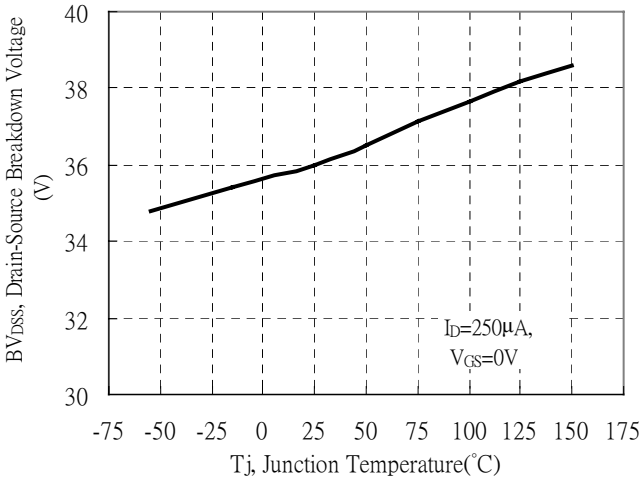
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

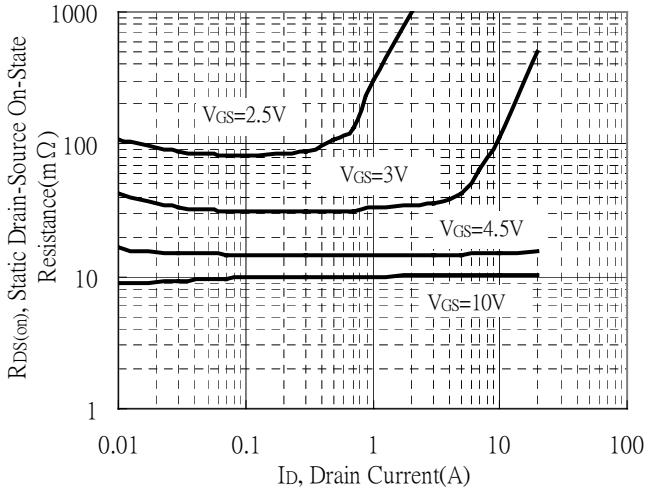
Typical Output Characteristics



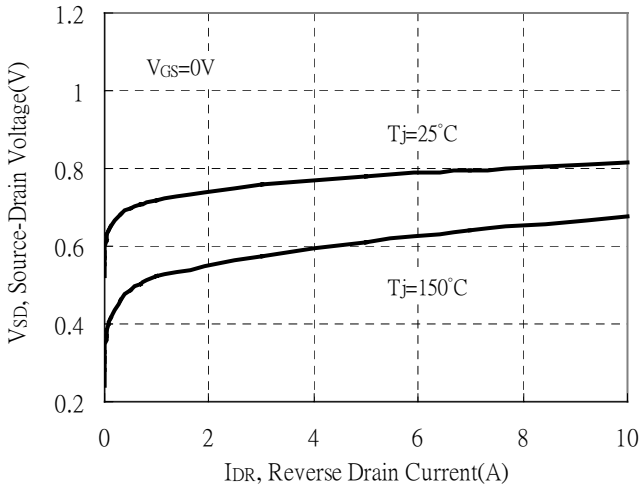
Brekdown Voltage vs Ambient Temperature



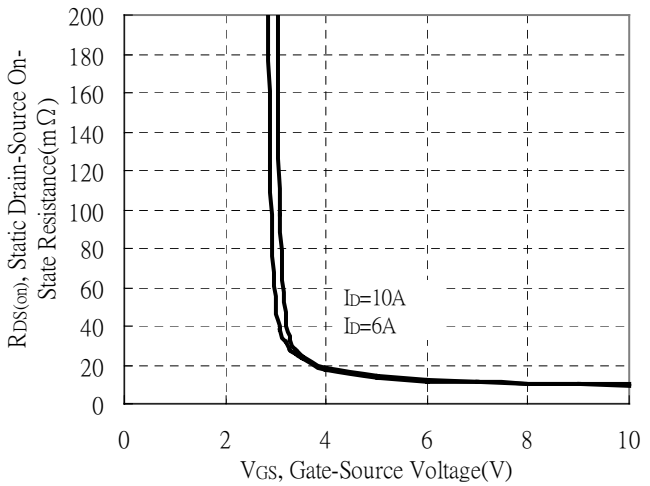
Static Drain-Source On-State resistance vs Drain Current



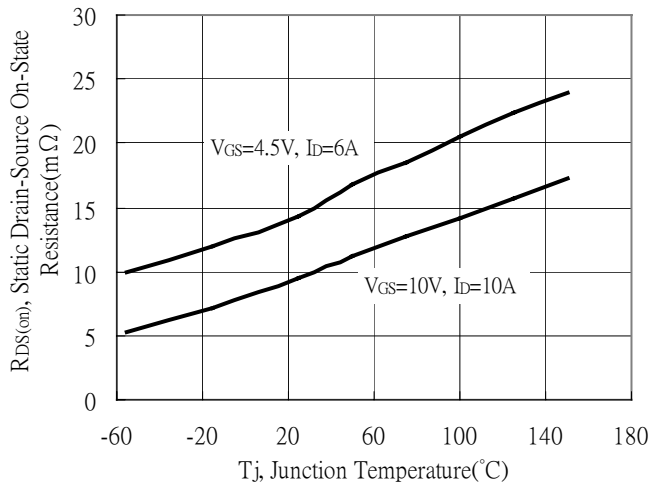
Reverse Drain Current vs Source-Drain Voltage



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

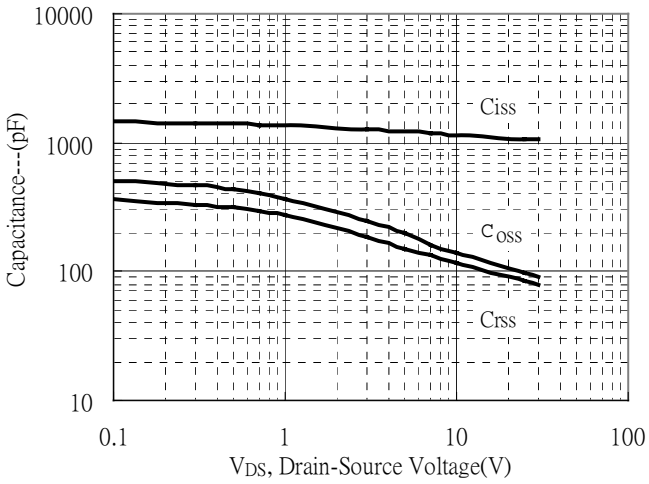


Drain-Source On-State Resistance vs Junction Tempearture

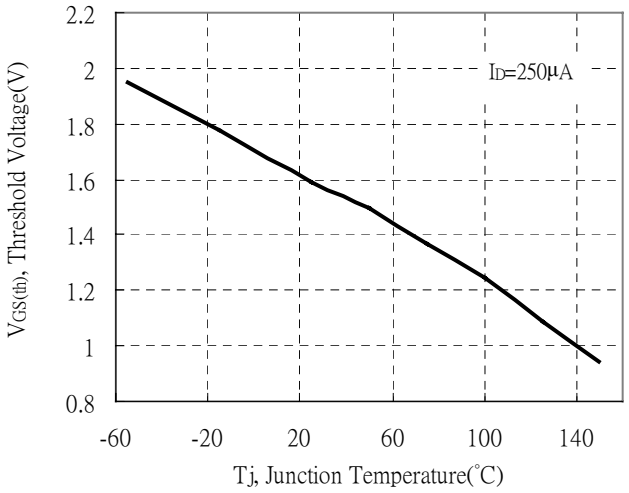


Typical Characteristics(Cont.)

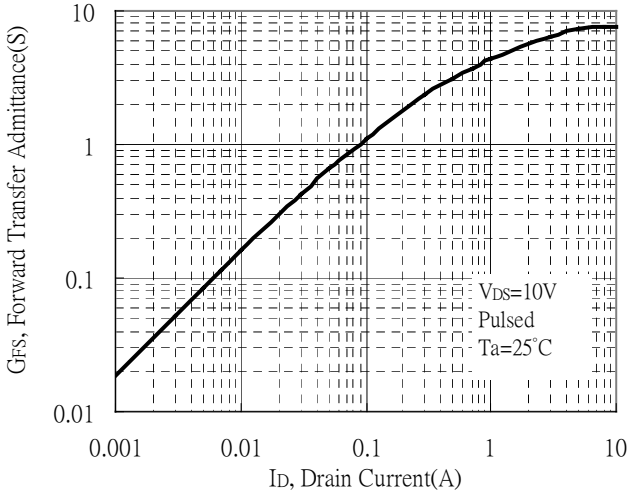
Capacitance vs Drain-to-Source Voltage



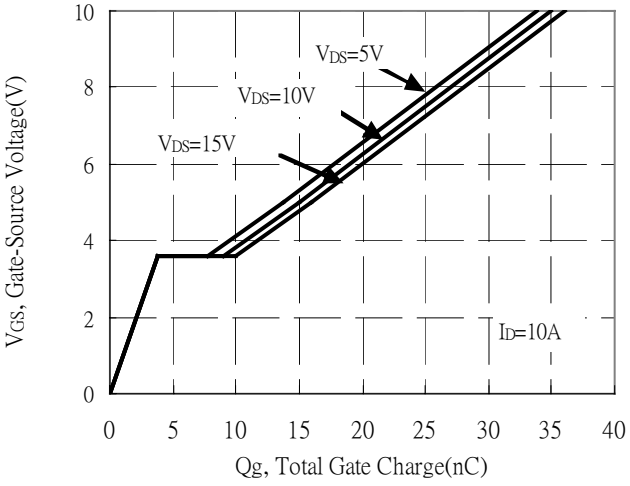
Threshold Voltage vs Junction Tempearture



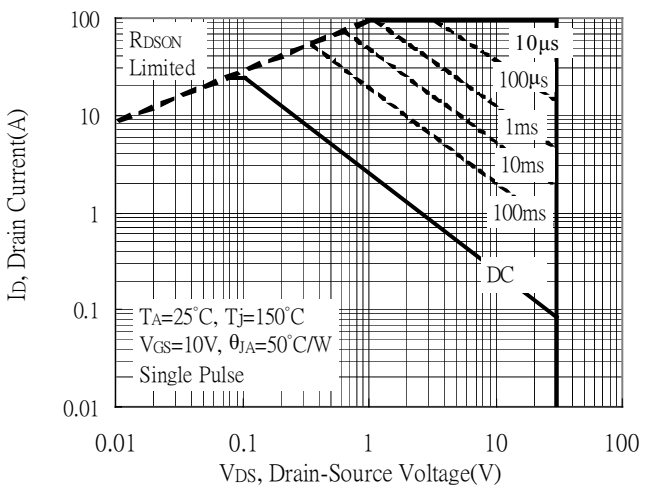
Forward Transfer Admittance vs Drain Current



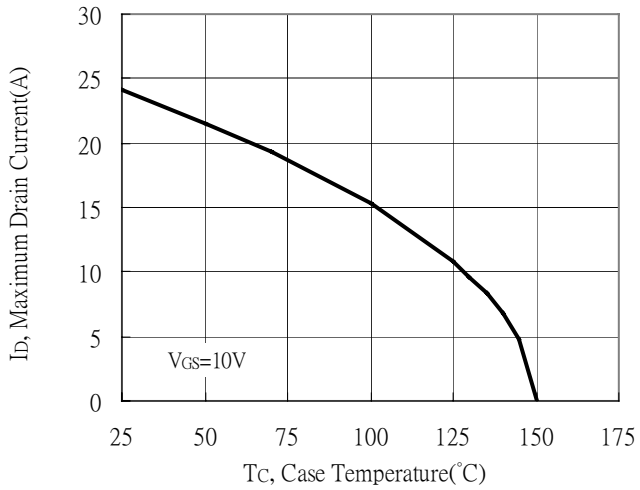
Gate Charge Characteristics



Maximum Safe Operating Area

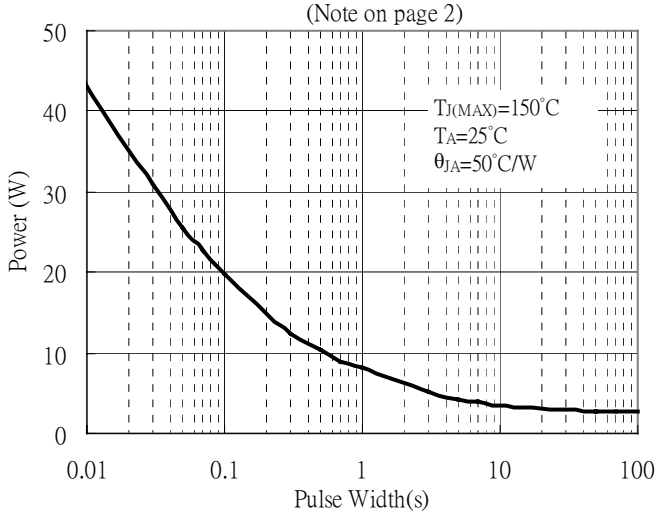


Maximum Drain Current vs Case Temperature

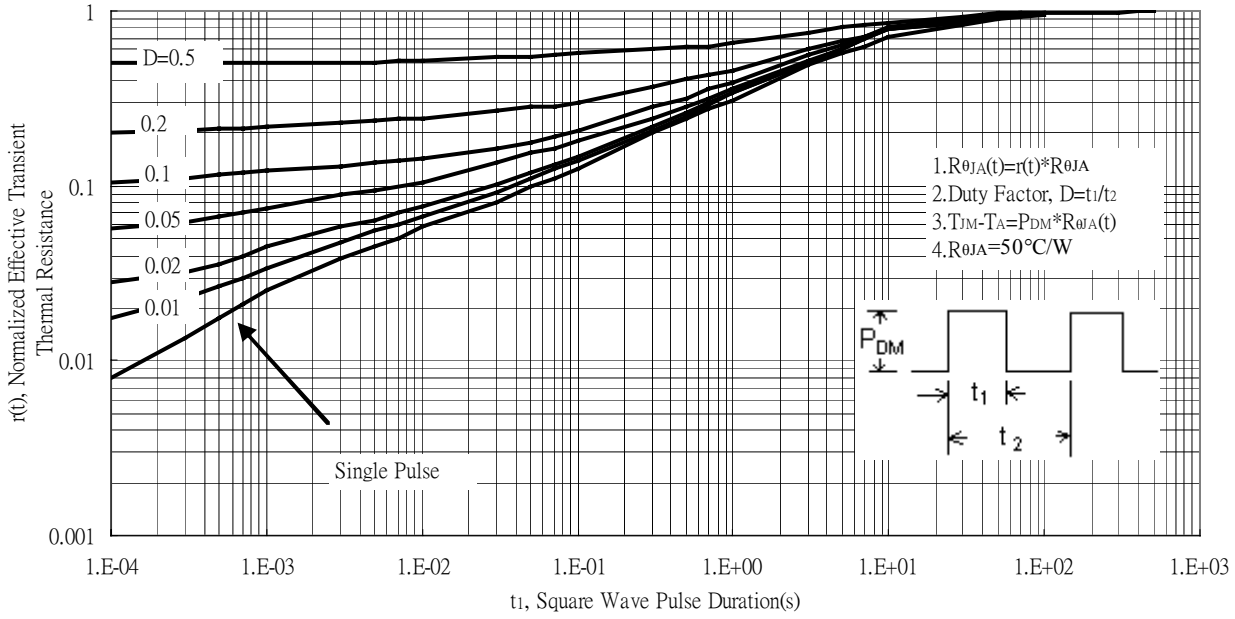


Typical Characteristics(Cont.)

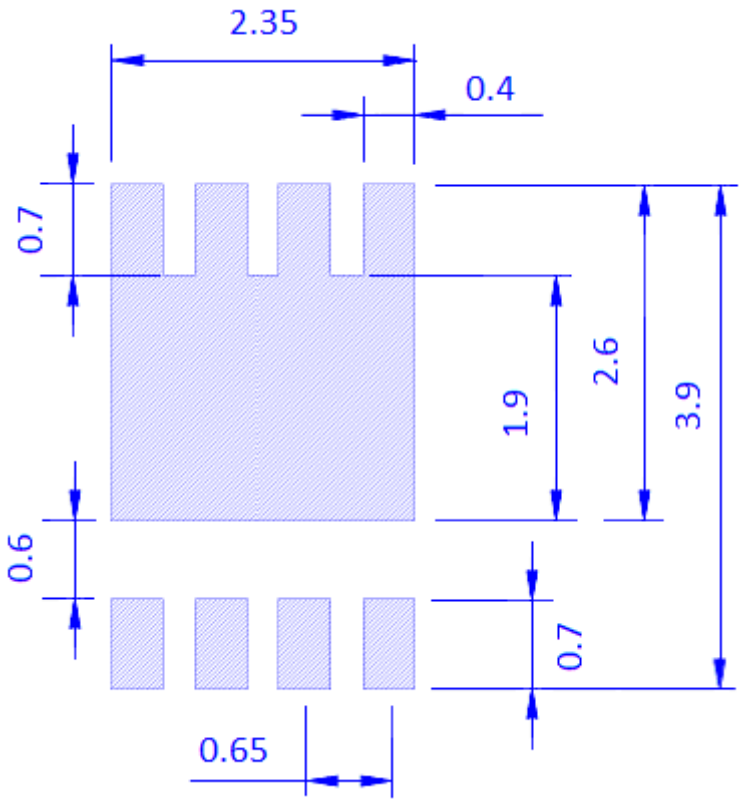
Single Pulse Power Rating, Junction to Ambient
(Note on page 2)



Transient Thermal Response Curves

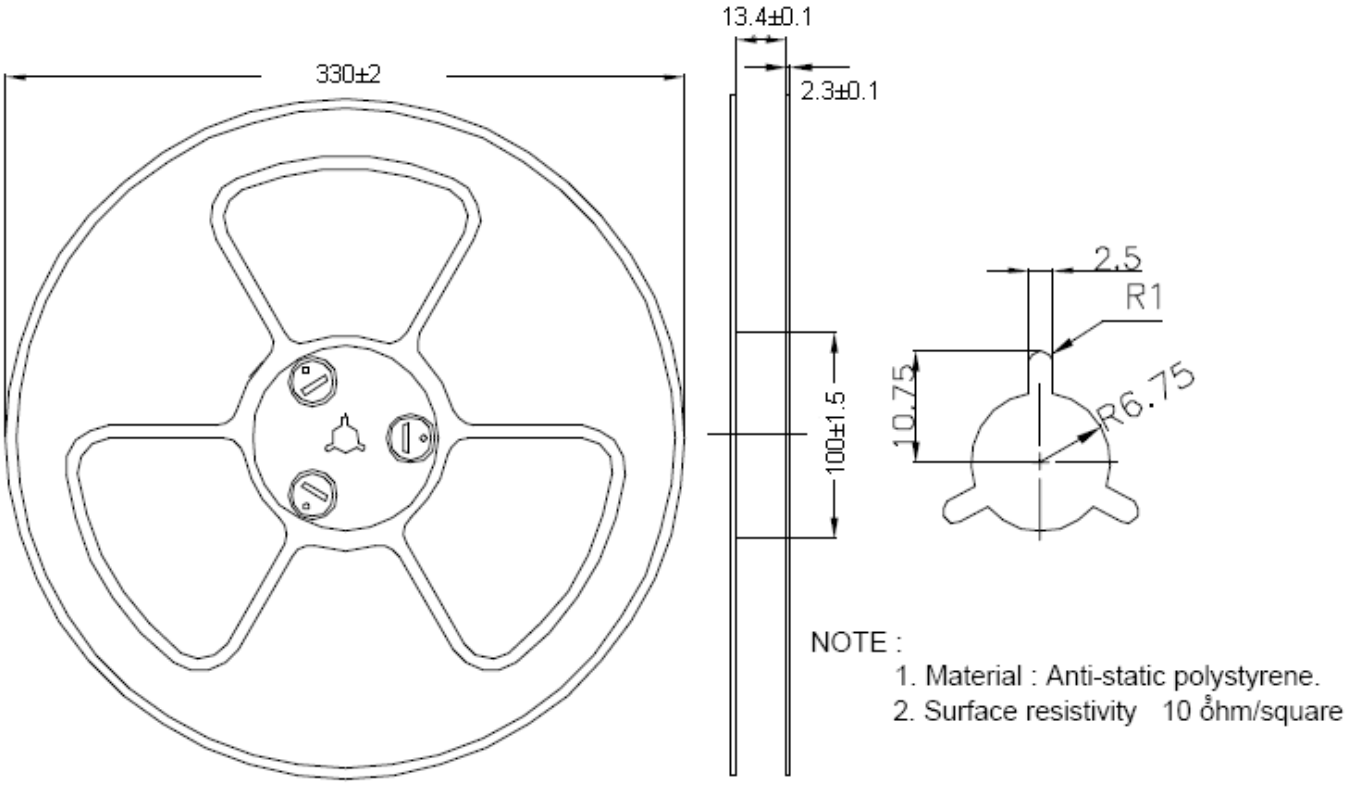


Recommended Soldering Footprint



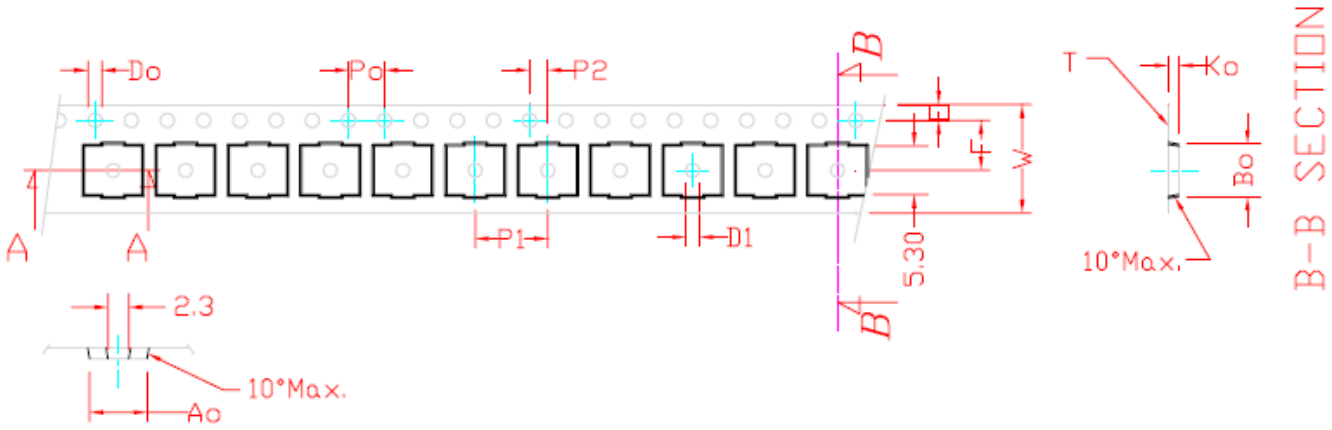
unit : mm

Reel Dimension



NOTE :
1. Material : Anti-static polystyrene.
2. Surface resistivity 10 ŏhm/square

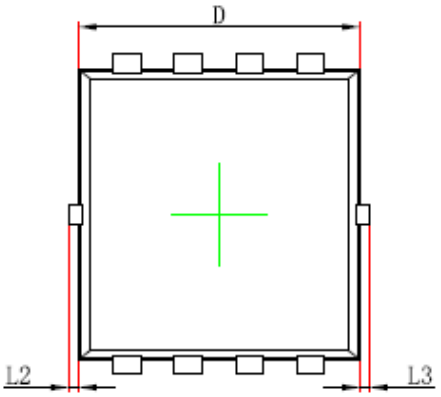
Carrier Tape Dimension



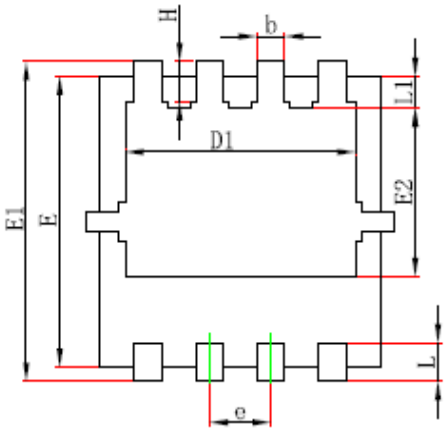
A-A SECTION

symbol	Ao	Bo	Ko	Po	P1	P2	T
Spec	6.33±0.1	5.78±0.1	1.18±0.1	4.00±0.1	8.0±0.10	2.0±0.05	0.29±0.02
symbol	E	F	Do	D1	W	10Po	
Spec	1.75±0.1	5.5±0.05	1.50±0.10	1.5±0.25	12.0 $^{+0.3}_{-0.1}$	40.0±0.2	

DFN3x3 Dimension

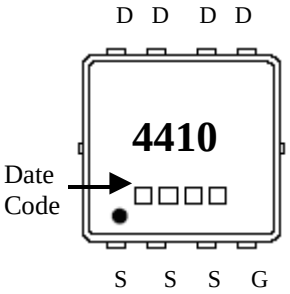


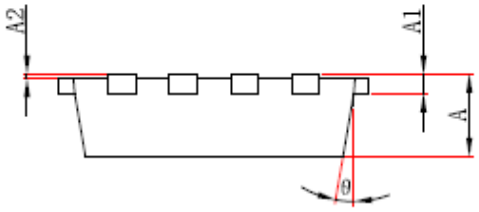
Top Vlew



Bottom Vlew

Marking:





Slde Vlew

8-Lead DFN3x3 Plastic Package

*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.605	0.850	0.026	0.033	b	0.200	0.400	0.008	0.016
A1	0.152 REF		0.006 REF		e	0.550	0.750	0.022	0.030
A2	0.000	0.050	0.000	0.002	L	0.300	0.500	0.012	0.020
D	2.900	3.100	0.114	0.122	L1	0.180	0.480	0.007	0.019
D1	2.300	2.600	0.091	0.102	L2	0.000	0.100	0.000	0.004
E	2.900	3.100	0.114	0.122	L3	0.000	0.100	0.000	0.004
E1	3.150	3.450	0.124	0.136	H	0.315	0.515	0.012	0.020
E2	1.535	1.935	0.060	0.076	θ	9°	13°	9°	13°