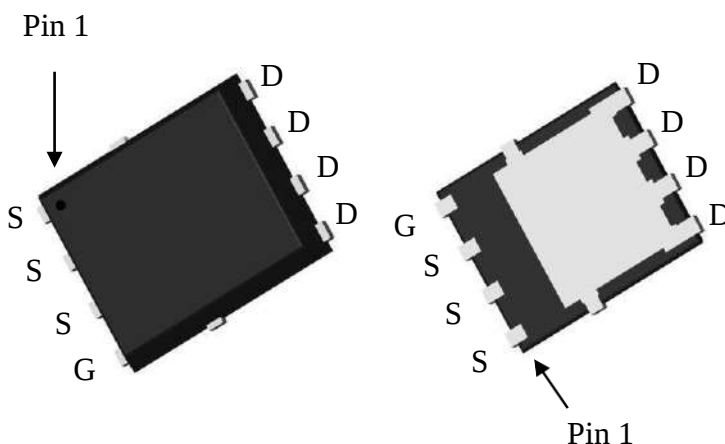


N-Channel Enhancement Mode Power MOSFET

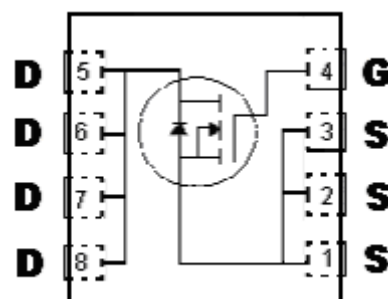
Features:

- Single Drive Requirement
- Low On-resistance
- Fast Switching Characteristic
- Pb-free lead plating and Halogen-free package

DFN5x6



BV_{DSS}	40V
I_D@V_{GS}=10V, T_C=25°C	74A(silicon limit)
I_D@V_{GS}=10V, T_A=25°C	16.5A
R_{DS(ON)} @ V_{GS}=10V, I_D=30A	3.8mΩ (typ.)



G : Gate D : Drain S : Source

Ordering Information

Device	Package	Shipping
KPRE4D5N04	DFN 5 ×6 (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}	40	V
Gate-Source Voltage		V _{GS}	±20	
Continuous Drain Current @ T _C =25°C, V _{GS} =10V (silicon limit)		I _D	74	A
Continuous Drain Current @ T _C =25°C, V _{GS} =10V (package limit)			60	
Continuous Drain Current @ T _C =100°C, V _{GS} =10V			46.8	
Continuous Drain Current @ T _A =25°C, V _{GS} =10V		I _{DSM}	16.5 *3	
Continuous Drain Current @ T _A =70°C, V _{GS} =10V			13.2 *3	
Pulsed Drain Current		I _{DM}	296 *1, 2	
Avalanche Current @ L=0.1mH		I _{AS}	60	
Avalanche Energy @ L=1mH		E _{AS}	338	mJ
Total Power Dissipation	T _C =25°C	P _D	50	W
	T _C =100°C		20	
	T _A =25°C	P _D SM	2.5 *3	
	T _A =70°C		1.6 *3	
Operating Junction and Storage Temperature Range		T _j , T _{stg}	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	R _{θJC}	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max	R _{θJA}	50 *3	

Note : 1.Pulse width limited by maximum junction temperature.

2.Duty cycle≤1%.

3.Surface mounted on 1in2 copper pad of FR-4 board, t≤10s; 125 °C/W when mounted on minimum copper pad.

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS}	40	-	-	V	V _{GS} =0V, I _D =250μA
V _{GS(th)}	2	-	4		V _{DS} = V _{GS} , I _D =250μA
G _{FS} *1	-	18	-	S	V _{DS} =10V, I _D =10A
I _{GSS}	-	-	±100	nA	V _{GS} =±20V, V _{DS} =0V
I _{DSS}	-	-	1	μA	V _{DS} =32V, V _{GS} =0V
	-	-	5		V _{DS} =32V, V _{GS} =0V, T _j =55°C
R _{DS(ON)} *1	-	3.8	5.8	mΩ	V _{GS} =10V, I _D =30A
Dynamic					
C _{iss}	-	2582	3356	pF	V _{DS} =25V, V _{GS} =0V, f=1MHz
C _{oss}	-	261	339		
C _{rss}	-	169	220		

Qg *1, 2	-	52.2	-	nC	V _{DS} =20V, V _{GS} =10V, I _D =30A
Qgs *1, 2	-	15	-		
Qgd *1, 2	-	11.1	-		
t _{d(ON)} *1, 2	-	24	-	ns	V _{DD} =20V, I _D =30A, V _{GS} =10V, R _{GS} =3.5Ω
tr *1, 2	-	11.4	-		
t _{d(OFF)} *1, 2	-	58.4	-		
t _f *1, 2	-	12	-		
Rg	-	0.9	-	Ω	f=1MHz
Source-Drain Diode					
I _S *1	-	-	40	A	
I _{SM} *3	-	-	160		
V _{SD} *1	-	0.83	1.2	V	I _S =30A, V _{GS} =0V
trr	-	14.9	-	ns	I _F =50A, dI _F /dt=100A/μs
Qrr	-	10.2	-	nC	

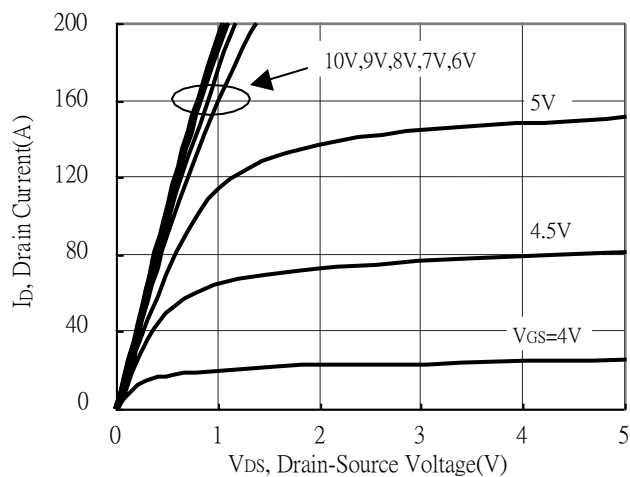
Note : *1.Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

*2.Independent of operating temperature

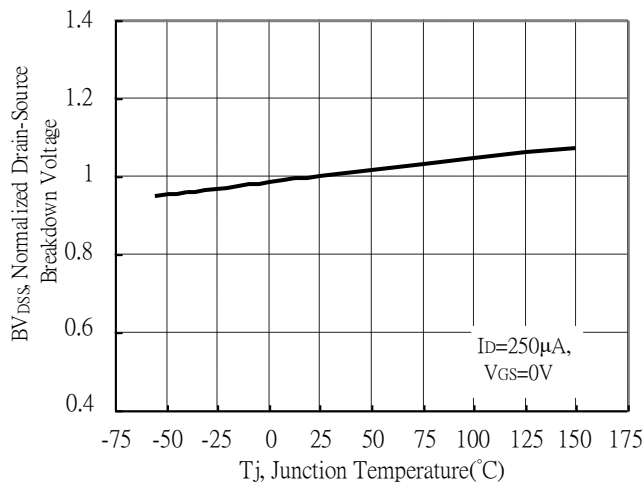
*3.Pulse width limited by maximum junction temperature.

Typical Characteristics

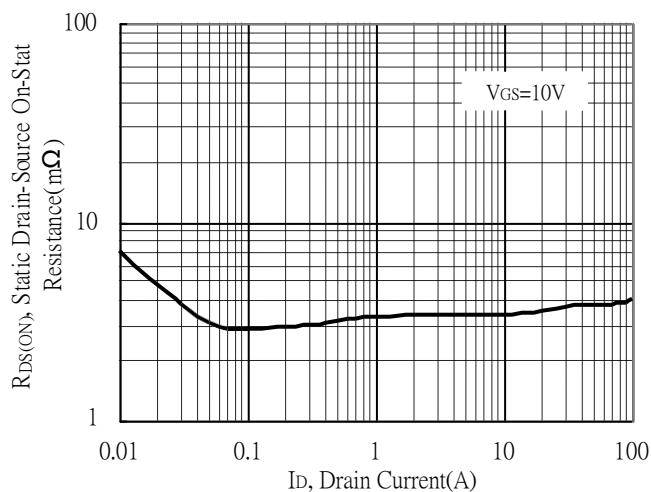
Typical Output Characteristics



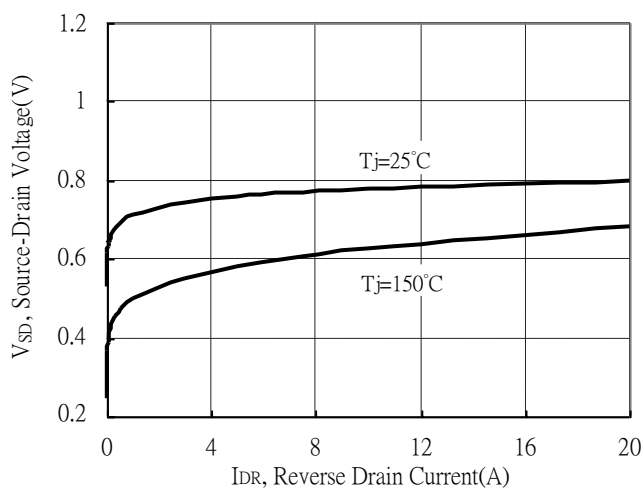
Breakdown Voltage vs Ambient Temperature



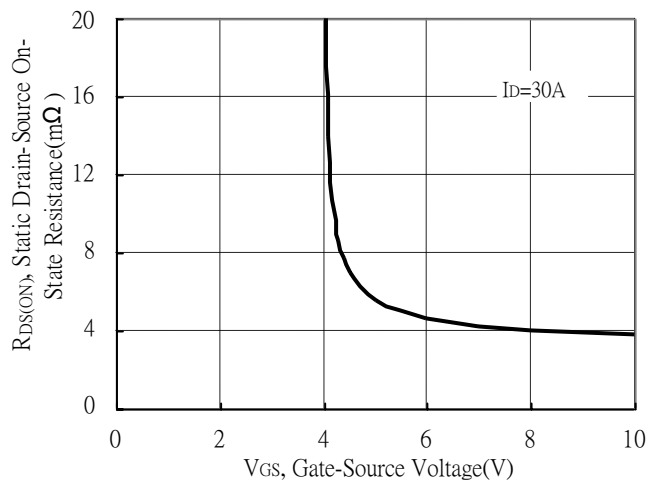
Static Drain-Source On-State resistance vs Drain Current



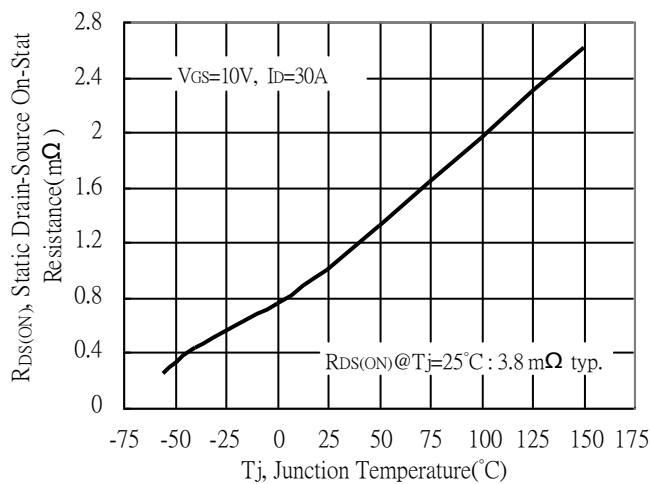
Reverse Drain Current vs Source-Drain Voltage



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

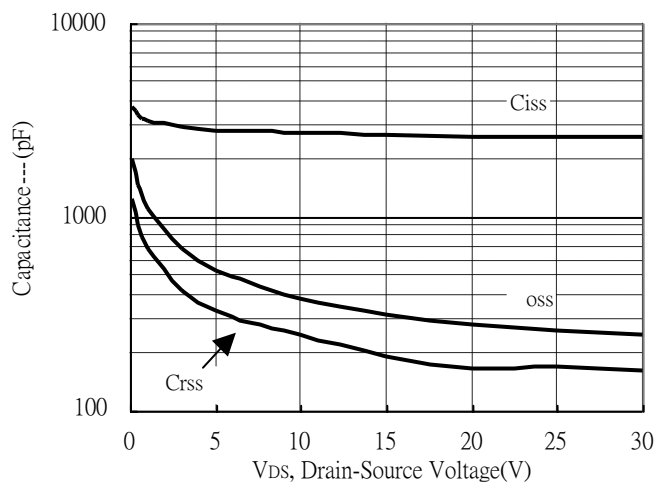


Drain-Source On-State Resistance vs Junction Temperature

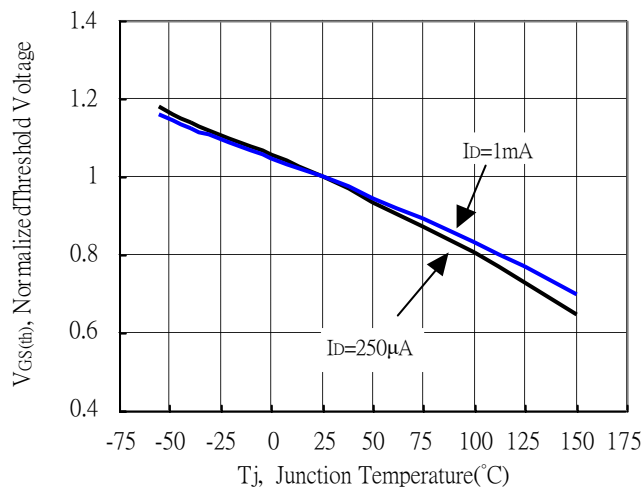


Typical Characteristics(Cont.)

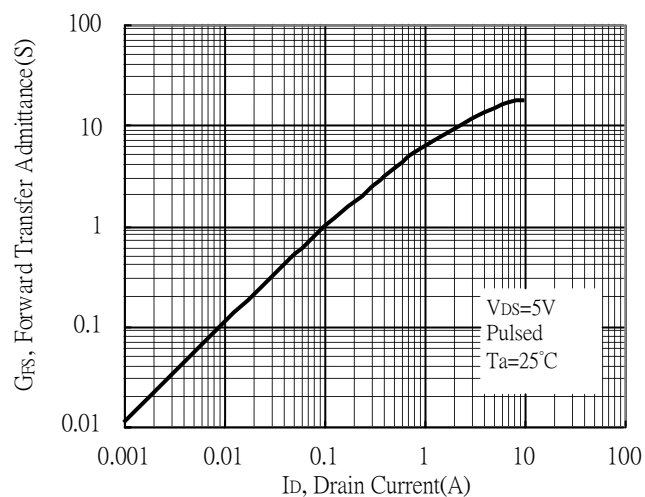
Capacitance vs Drain-to-Source Voltage



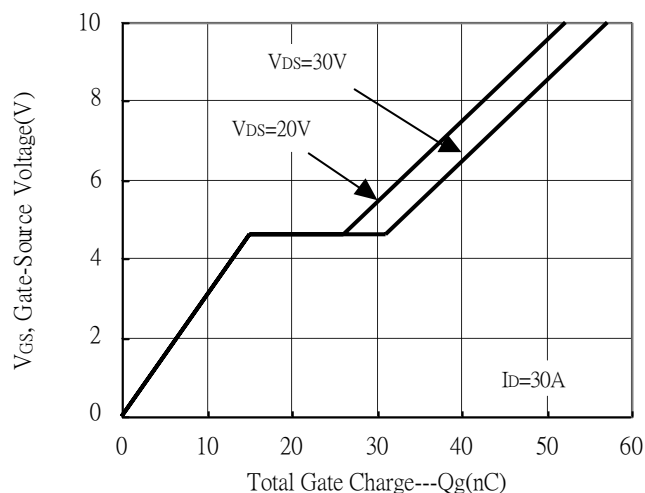
Threshold Voltage vs Junction Temperature



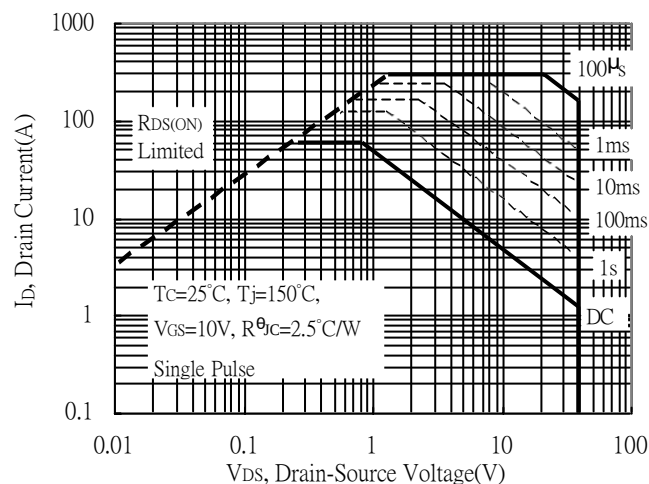
Forward Transfer Admittance vs Drain Current



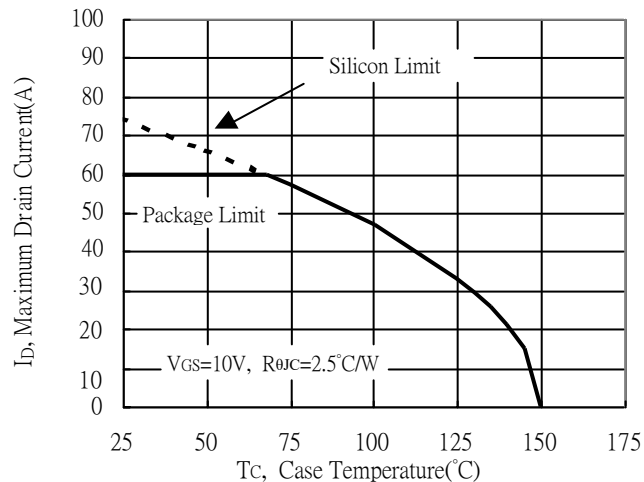
Gate Charge Characteristics



Maximum Safe Operating Area

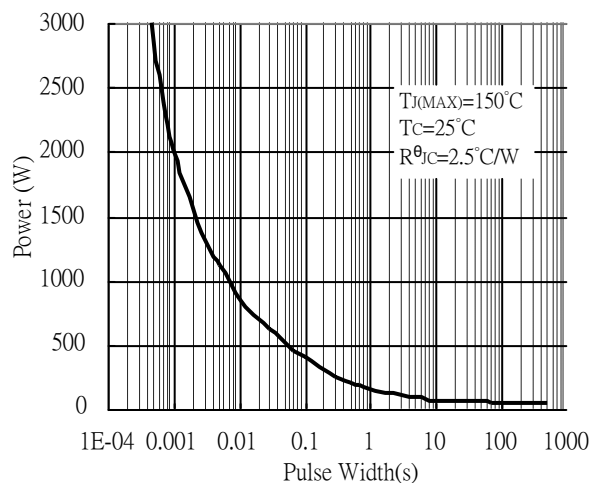


Maximum Drain Current vs Case Temperature

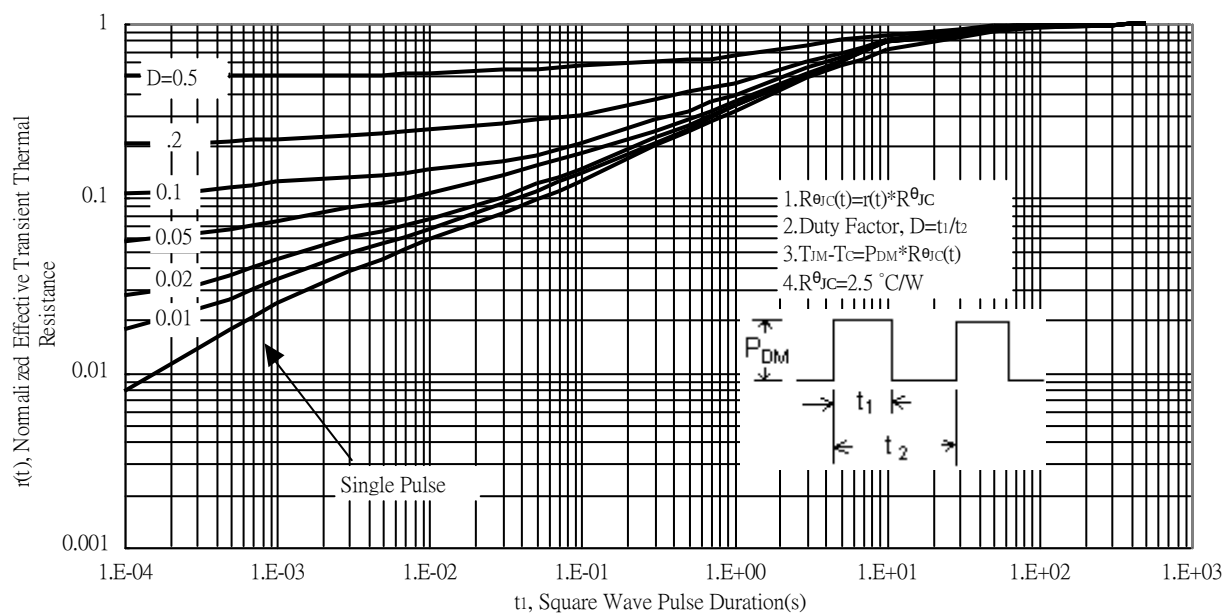


Typical Characteristics(Cont.)

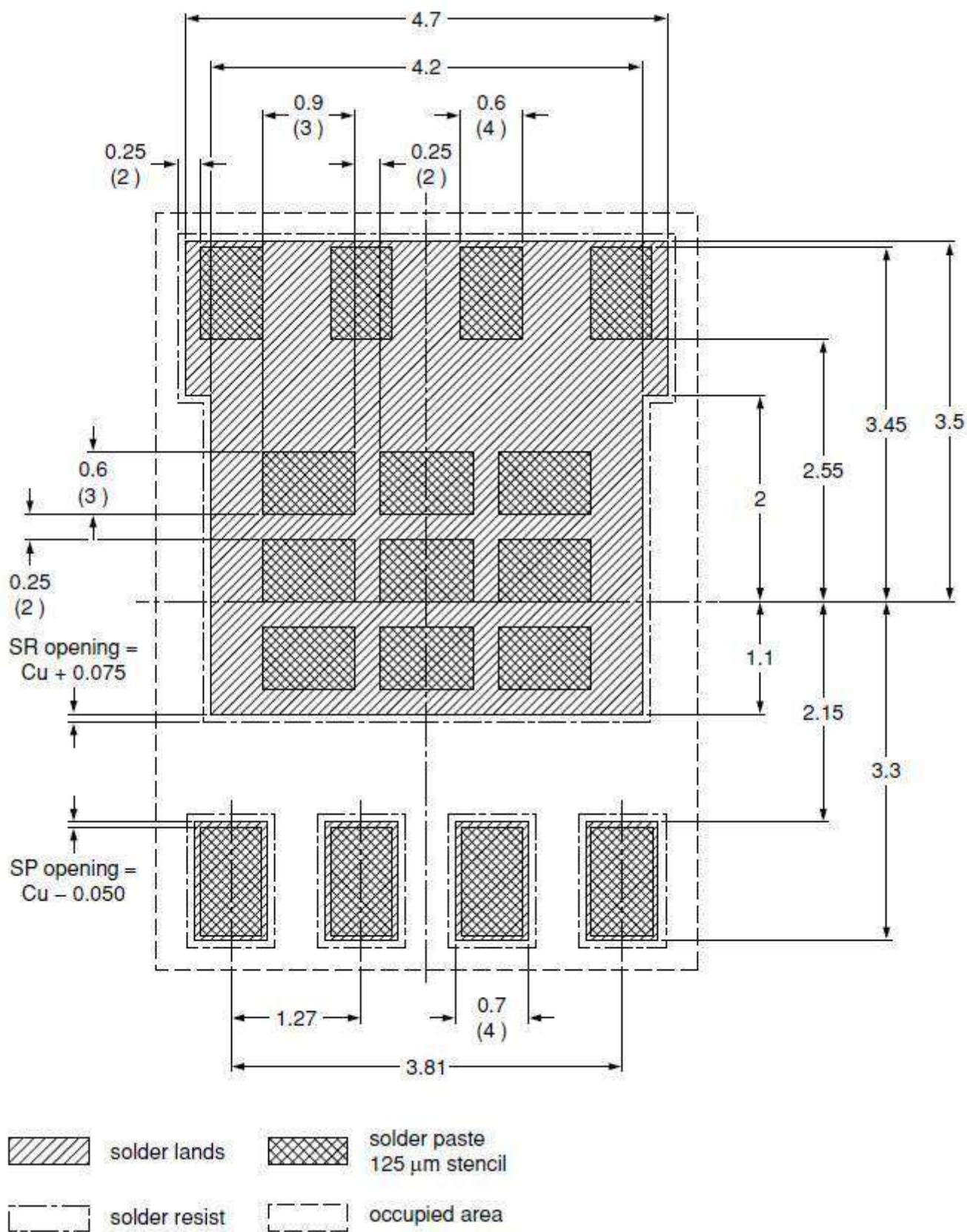
Single Pulse Maximum Power Dissipation



Transient Thermal Response Curves

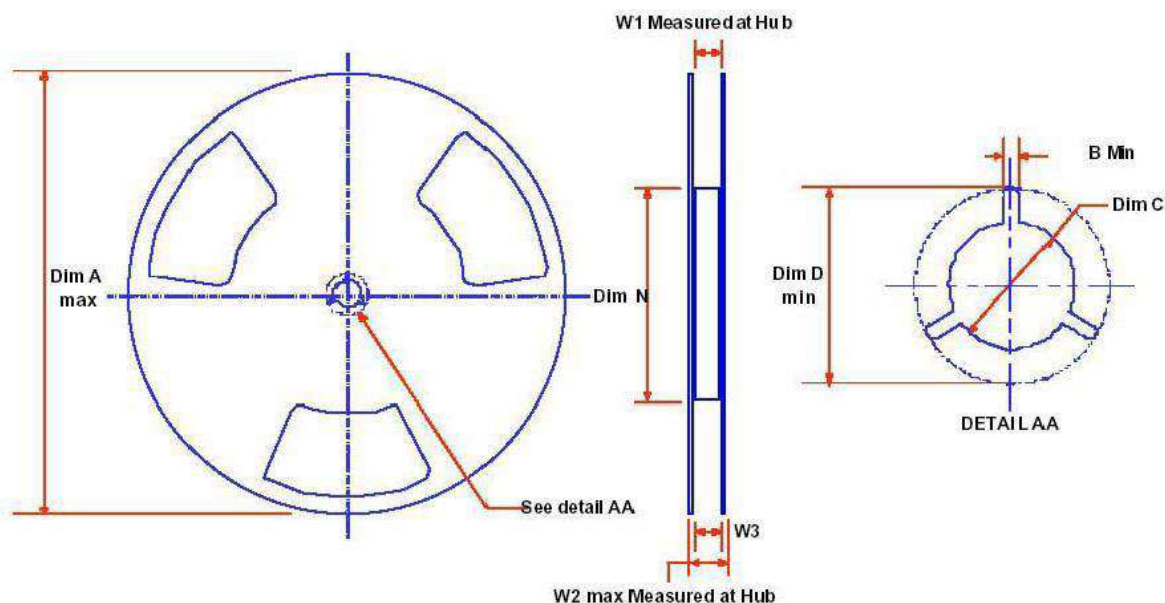


Recommended Soldering Footprint & Stencil Design



unit : mm

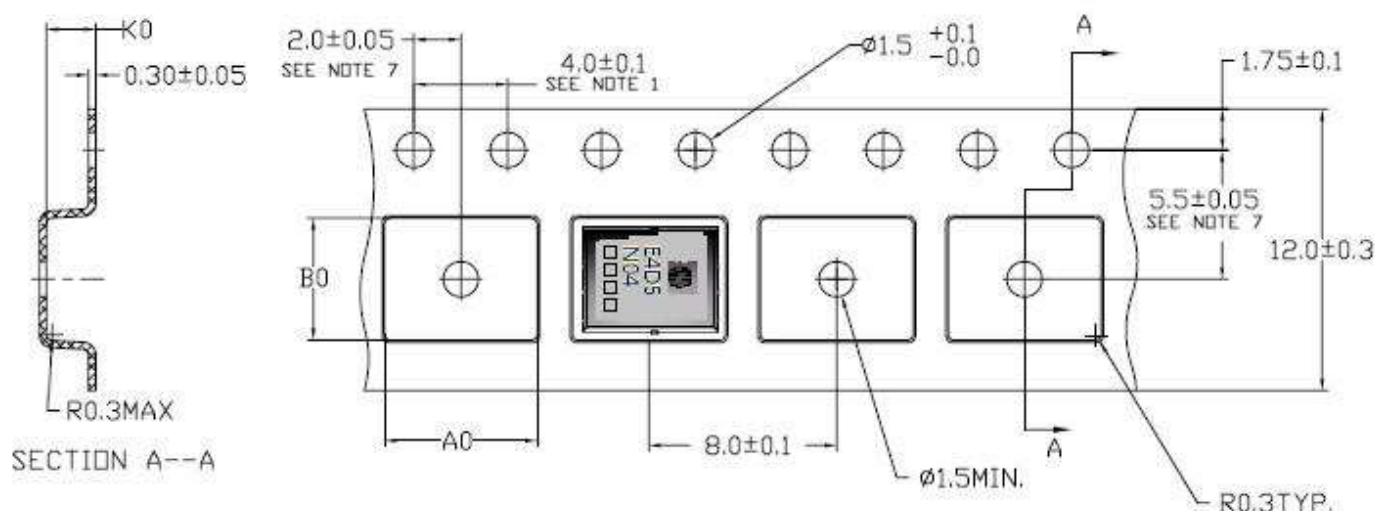
Reel Dimension



Dimensions are in inches and millimeters

Tape Size	Reel Option	Dim A	Dim B	Dim C	Dim D	Dim N	Dim W1	Dim W2	Dim W3 (LSL-USL)
12mm	13" Dia (STD/L99Z)	13.00 330+/-1	0.059 1.5 Min.	0.512 13.0 Min.	0.795 20.2(ref.)	7.00 178+0/-2	0.488 +0.078/-0.000 12.4 +2/0	0.724 18.4(ref.)	0.469 - 0.606 11.9 - 15.4

Carrier Tape Dimension

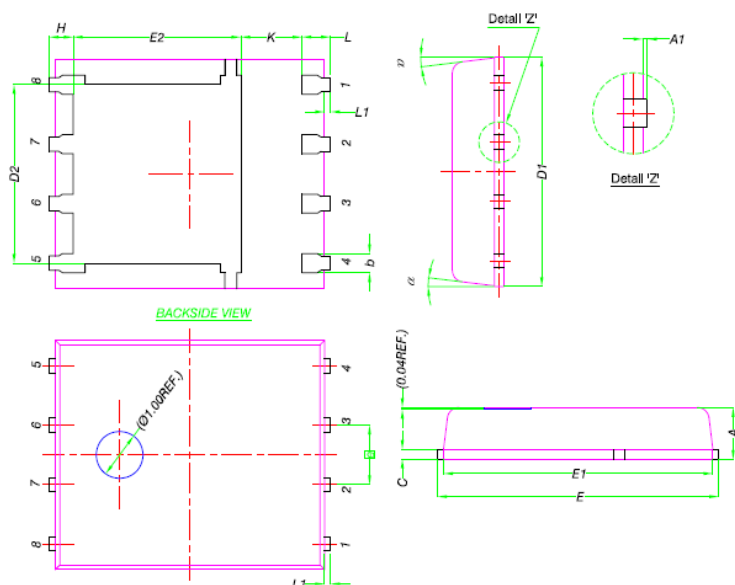


NOTE:

1. ID SPROCKET HOLE PITCH CUMULATIVE TOLERANCE ±0.2
2. CAMBER NOT TO EXCEED 1mm IN 100mm, NONCUMULATIVE OVER 250mm.
3. MATERIAL: BLACK STATIC DISSIPATIVE PS(POLYSTYRENE)
4. ALL DIMENSIONS ARE IN MILLIMETERS (UNLESS OTHERWISE SPECIFIED)
5. A0 AND B0 MEASURED ON A PLANE 0.3mm ABOVE THE BOTTOM OF THE POCKET
6. K0 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 POCKET, NOT POCKET HOLE
8. SURFACE RESISTIVITY
1X10E4~1X10E11 OHMS/SQ.

A0=6.5±0.1
B0=5.3±0.1
K0=1.4±0.1

DFN5x6 Dimension



Marking:

Device Name

**E4D5
N04**

Date Code



8-Lead DFN5x6 Plastic Package

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.90	1.10	0.035	0.043	E2	3.38	3.78	0.133	0.149
A1	0.00	0.05	0.000	0.002	e	1.27	BSC	0.050	BSC
b	0.33	0.51	0.013	0.020	H	0.41	0.61	0.016	0.024
C	0.20	0.30	0.008	0.012	K	1.10	-	0.043	-
D1	4.80	5.00	0.189	0.197	L	0.51	0.71	0.020	0.028
D2	3.61	3.96	0.142	0.156	L1	0.06	0.20	0.002	0.008
E	5.90	6.10	0.232	0.240	θ	8°	12°	8°	12°
E1	5.70	5.80	0.224	0.228					