Dual P-Channel Enhancement Mode MOSFET

MTA050B01DFA6

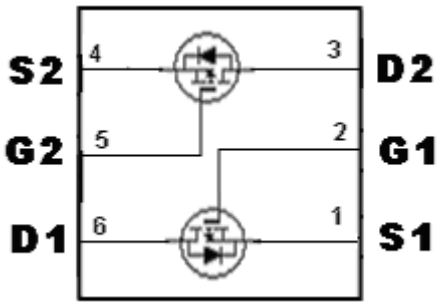
BV_{DSS}	-14V
I_D @V_{GS}=-4.5 V, T_A=25°C	-4.3A
R_{DSON}@V_{GS}=-4.5V, I_D=-3.6A	39mΩ (TYP.)
R_{DSON}@V_{GS}=-2.5V, I_D=-3.2A	55mΩ (TYP.)
R_{DSON}@V_{GS}=-1.8V, I_D=-1.0A	69mΩ (TYP.)

Features

- Simple drive requirement
- Low gate charge
- Low on-resistance
- Fast switching speed
- Pb-free lead plating and halogen-free package

Equivalent Circuit

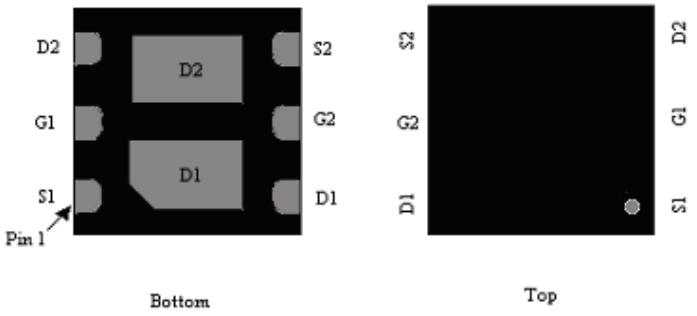
MTA050B01DFA6



G：Gate S：Source D：Drain

Outline

DFN2x2-6L



Ordering Information

Device	Package	Shipping
MTA050B01DFA6-0-T1-G	DFN2x2-6L (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

- Environment friendly grade : S for RoHS compliant products, G for RoHS compliant and green compound products
- Packing spec, T1 : 3000 pcs / tape & reel, 7” reel
- Product rank, zero for no rank products
- Product name

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	-14	V
Gate-Source Voltage	V_{GS}	±8	
Continuous Drain Current @T_A=25 °C, V_{GS}=-4.5V (Note 1)	I_D	-4.3	A
Continuous Drain Current @T_A=70 °C, V_{GS}=-4.5V (Note 1)		-3.4	
Pulsed Drain Current (Note 2)	I_{DM}	-26	
Total Power Dissipation (Note 1)	P_D	1.38	W
Linear Derating Factor		0.01	W / °C
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board, t≤5 sec
2.Pulse width limited by maximum junction temperature

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{\theta JC}$	75	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{\theta JA}$	90 (Note)	

Note :.Surface mounted on 1 in² copper pad of FR-4 board, t≤5 sec; 195°C/W when mounted on minimum copper pad

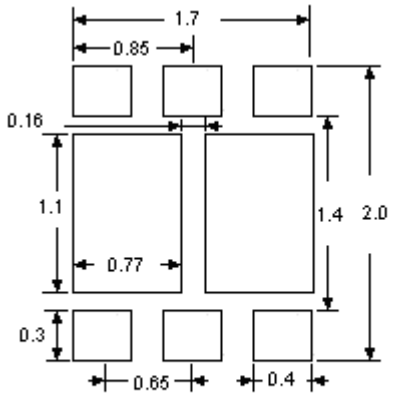
Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-14	-	-	V	V_{GS}=0V, I_D=-250μA
$\Delta BV_{DSS}/\Delta Tj$	-	-5	-	mV/°C	Reference to 25°C, I_D=-250μA
$V_{GS(th)}$	-	-0.8	-1.2	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±8V, V_{DS}=0V
I_{DSS}	-	-	-1	μA	V_{DS}=-12V, V_{GS}=0V
	-	-	-25		V_{DS}=-12V, V_{GS}=0V, Tj=70°C
*$R_{DS(ON)}$	-	39	55	mΩ	V_{GS}=-4.5V, I_D=-3.6A
	-	55	77		V_{GS}=-2.5V, I_D=-3.2A
	-	69	-		V_{GS}=-1.8V, I_D=-1.0A
*G_{FS}	-	7.4	-	S	V_{DS}=-5V, I_D=-3A
Dynamic					
Ciss	-	678	-	pF	V_{DS}=-10V, V_{GS}=0V, f=1MHz
Coss	-	130	-		
Crss	-	123	-		
*$t_{d(ON)}$	-	11.6	-	ns	V_{DS}=-10V, I_D=-1A, V_{GS}=-4.5V, R_G=6Ω
*t_r	-	22.8	-		
*$t_{d(OFF)}$	-	56	-		
*t_f	-	33.2	-		

*Qg	-	8.8	-	nC	V_{DS}=-10V, I_D=-1.5A, V_{GS}=-4.5V
*Qgs	-	0.9	-		
*Qgd	-	2.7	-		
Rg	-	15	-	Ω	f=1MHz
Source-Drain Diode					
*V_{SD}	-	-0.9	-1.2	V	V_{GS}=0V, I_S=-3.4A
*trr	-	24.7	-	ns	I_F=-3.4A, V_{GS}=0V, dI_F/dt=100A/μs
*Qrr	-	4.8	-	nC	

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

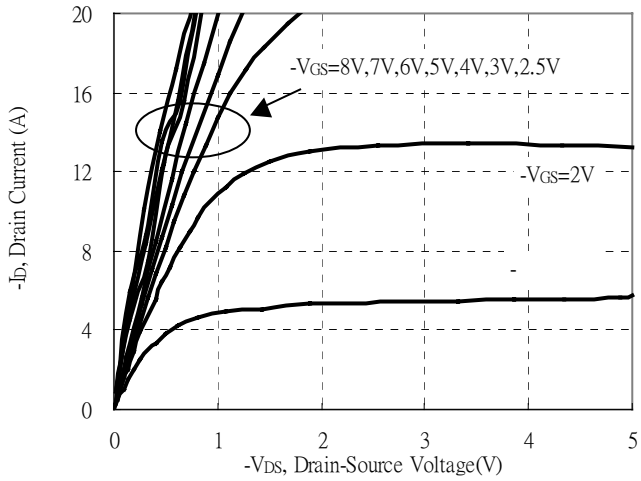
Recommended Soldering Footprint



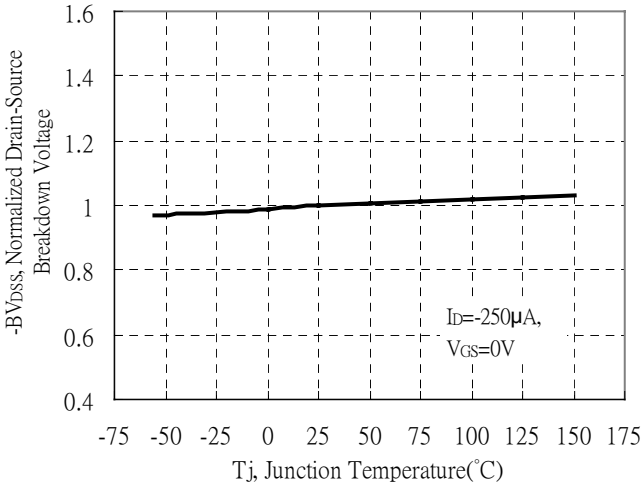
Unit : mm

Typical Characteristics

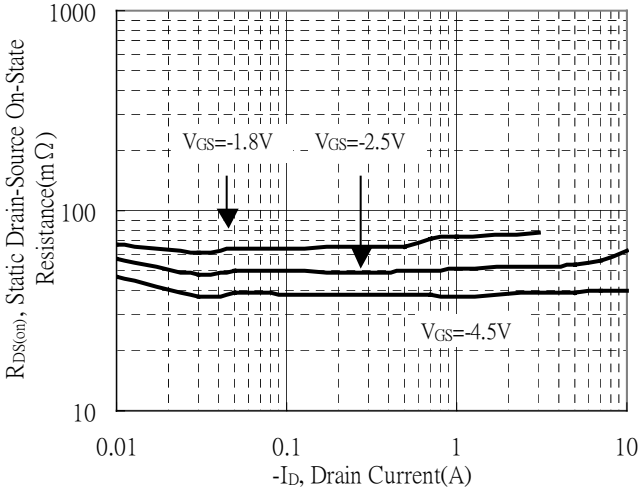
Typical Output Characteristics



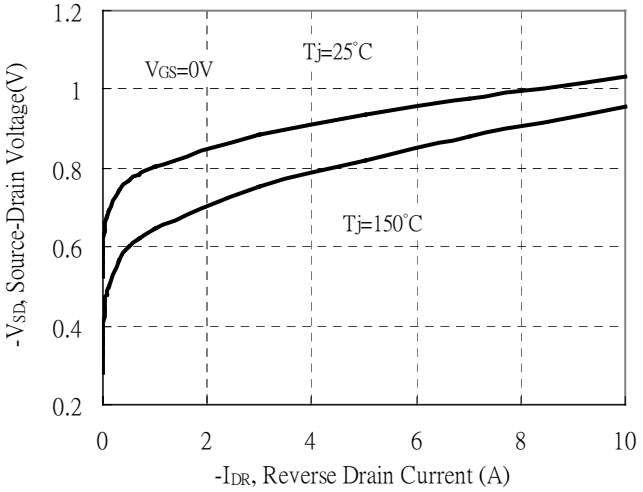
Brekdown Voltage vs Ambient Temperature



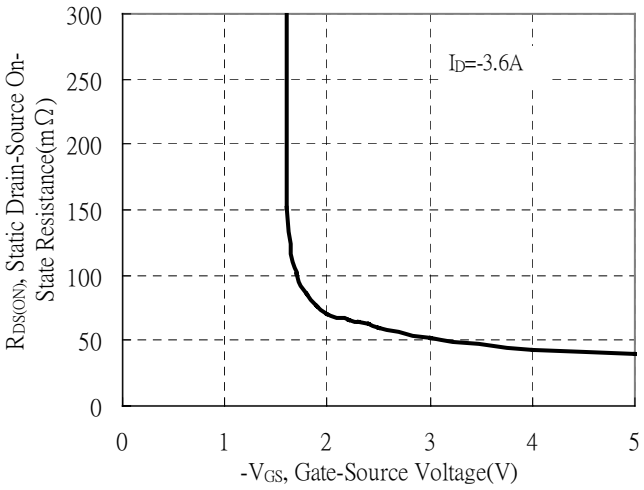
Static Drain-Source On-State resistance vs Drain Current



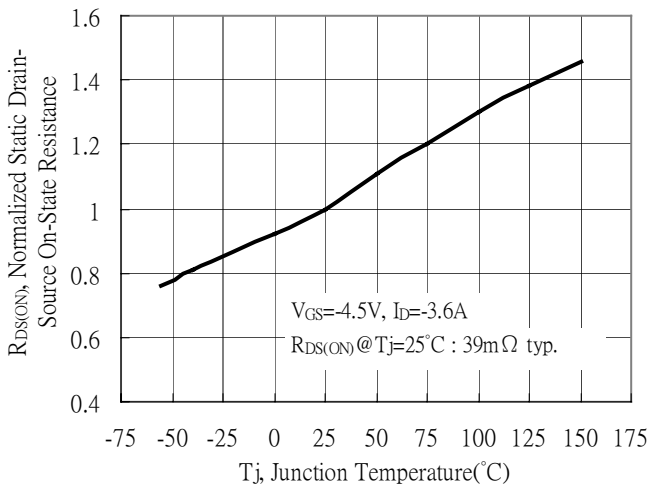
Reverse Drain Current vs Source-Drain Voltage



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

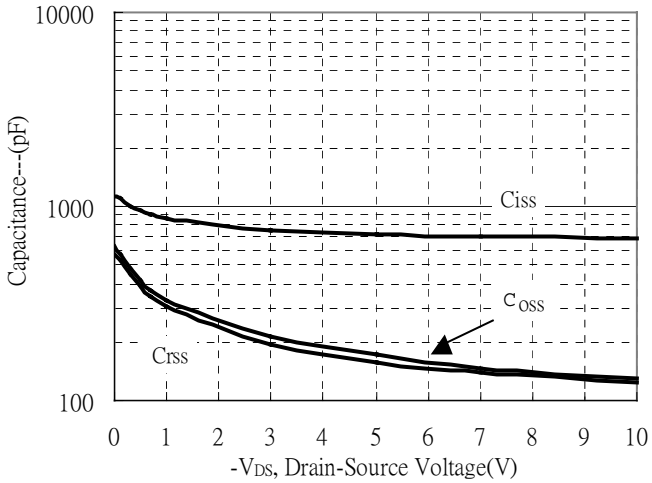


Drain-Source On-State Resistance vs Junction Tempearture

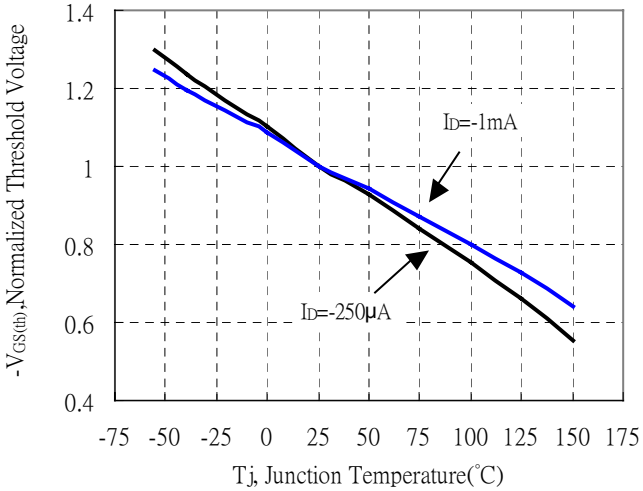


Typical Characteristics(Cont.)

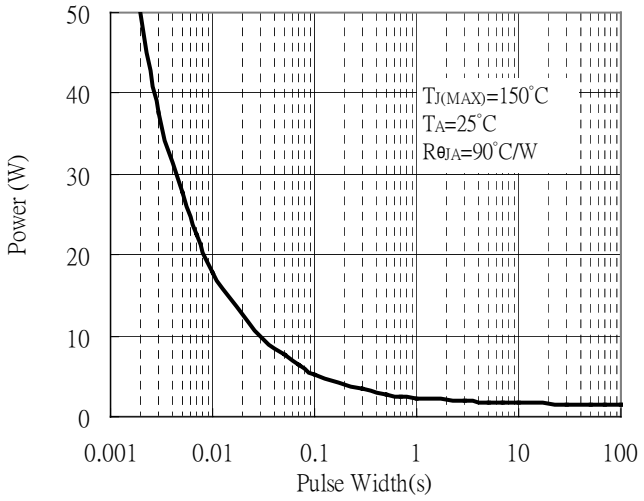
Capacitance vs Drain-to-Source Voltage



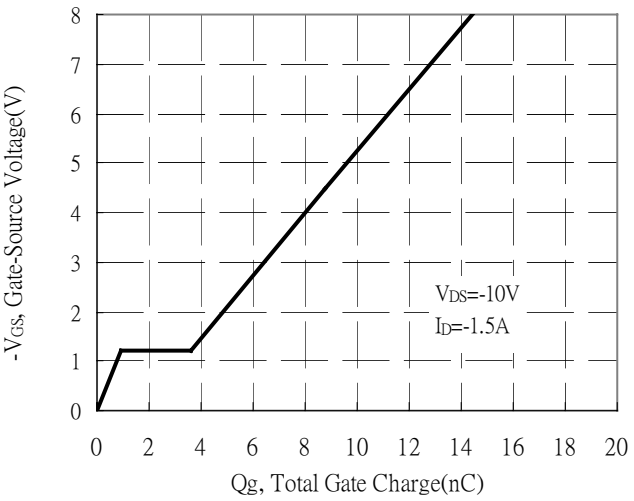
Threshold Voltage vs Junction Tempearture



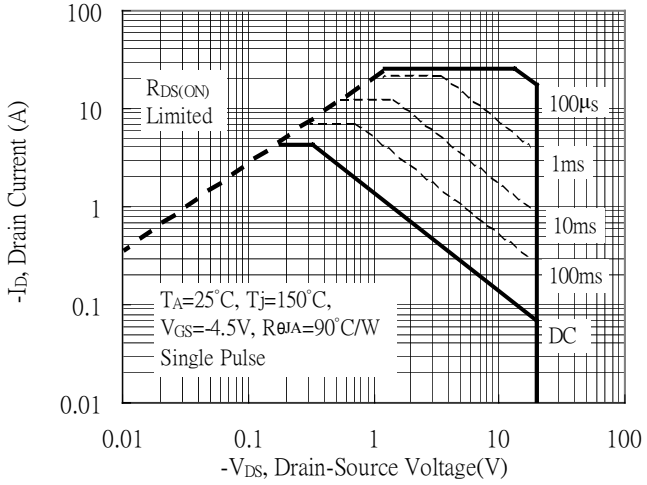
Single Pulse Power Rating, Junction to Ambient



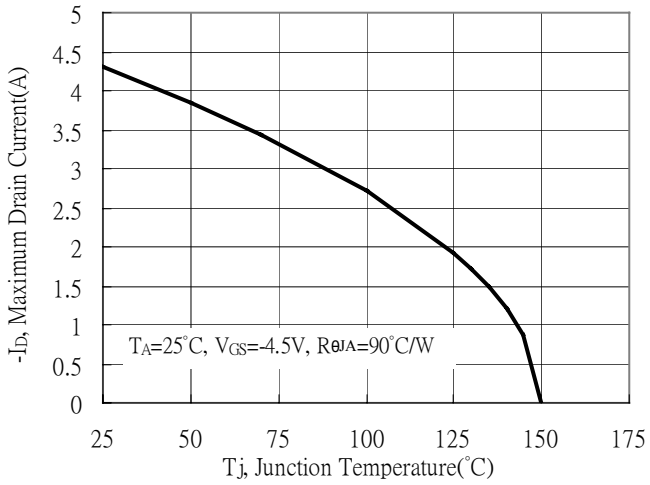
Gate Charge Characteristics



Maximum Safe Operating Area

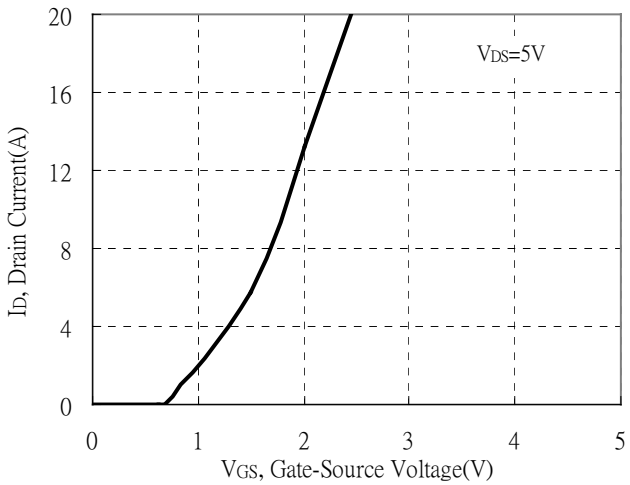


Maximum Drain Current vs JunctionTemperature

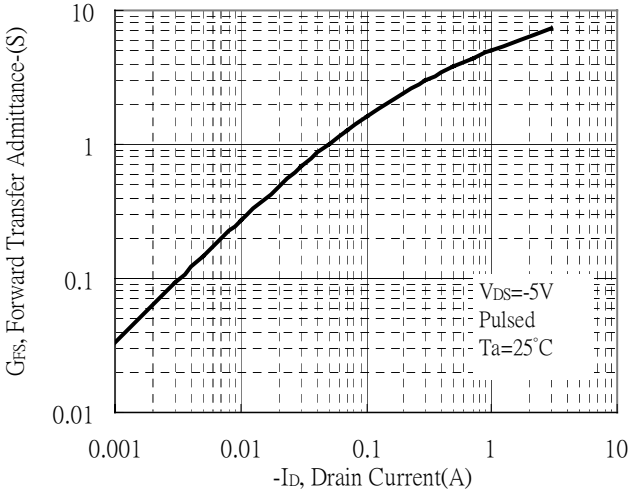


Typical Characteristics(Cont.)

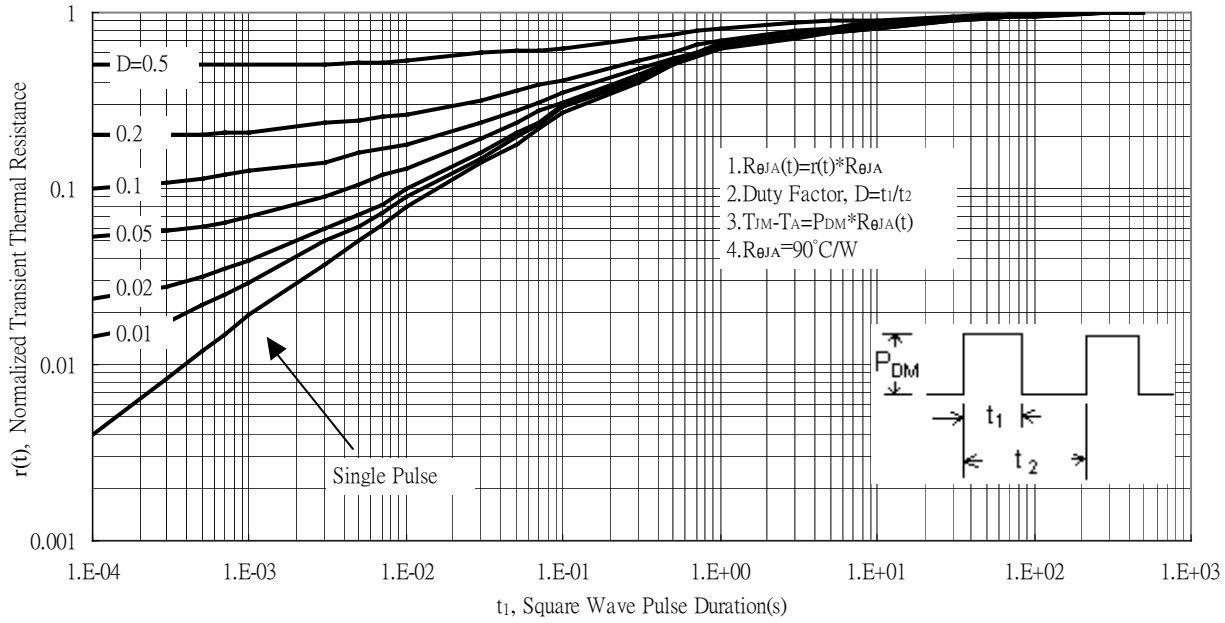
Typical Transfer Characteristics



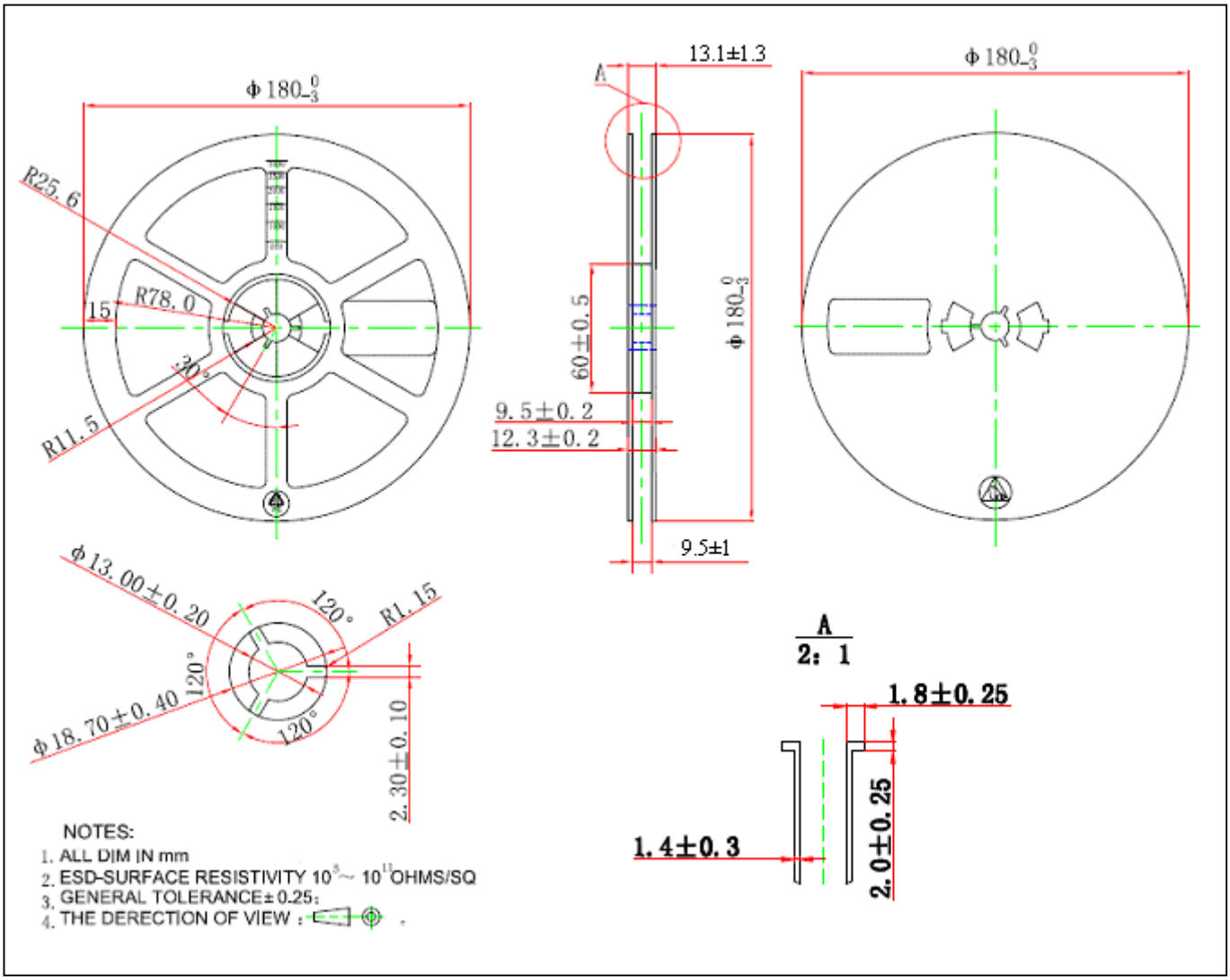
Forward Transfer Admittance vs Drain Current



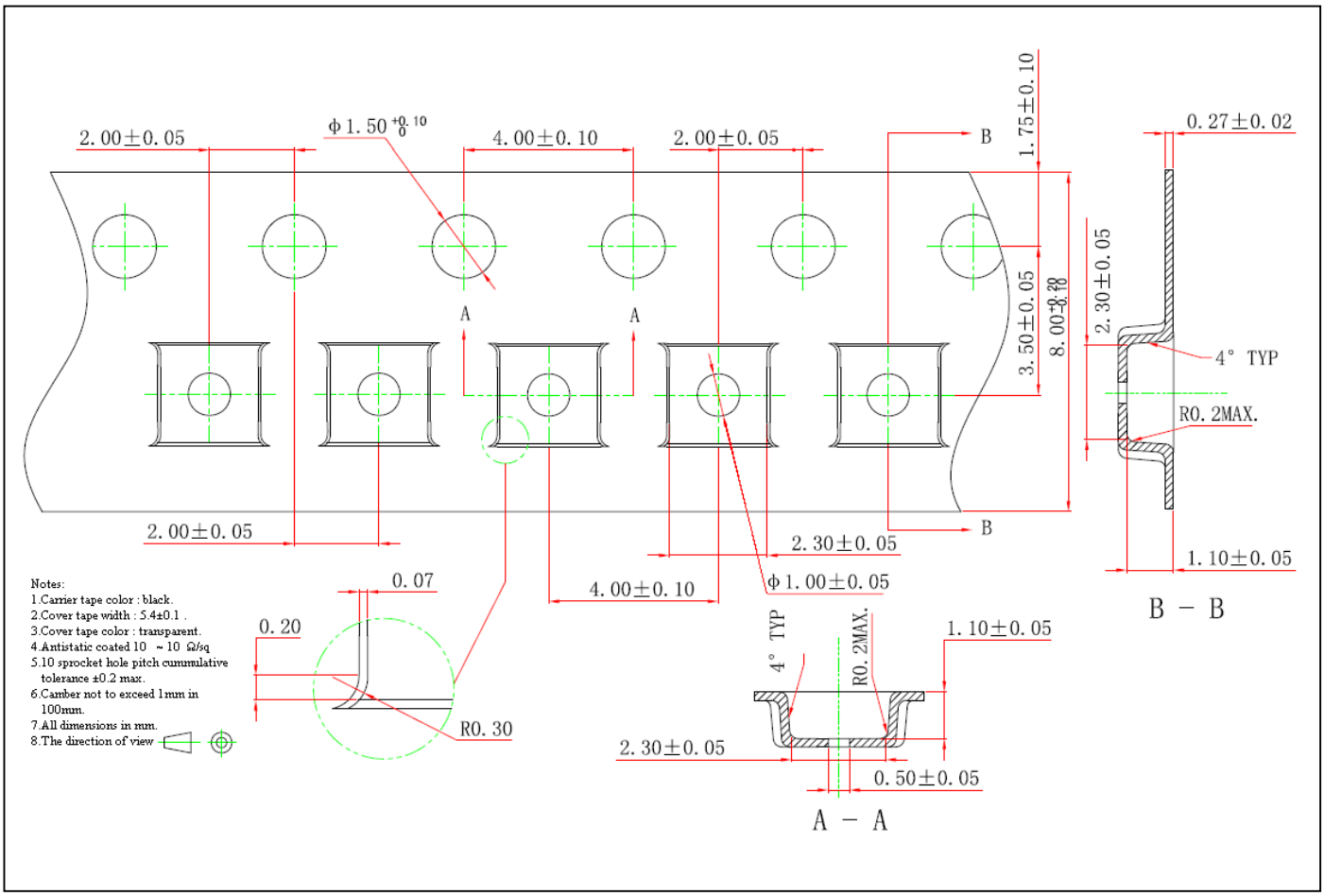
Transient Thermal Response Curves



Reel Dimension



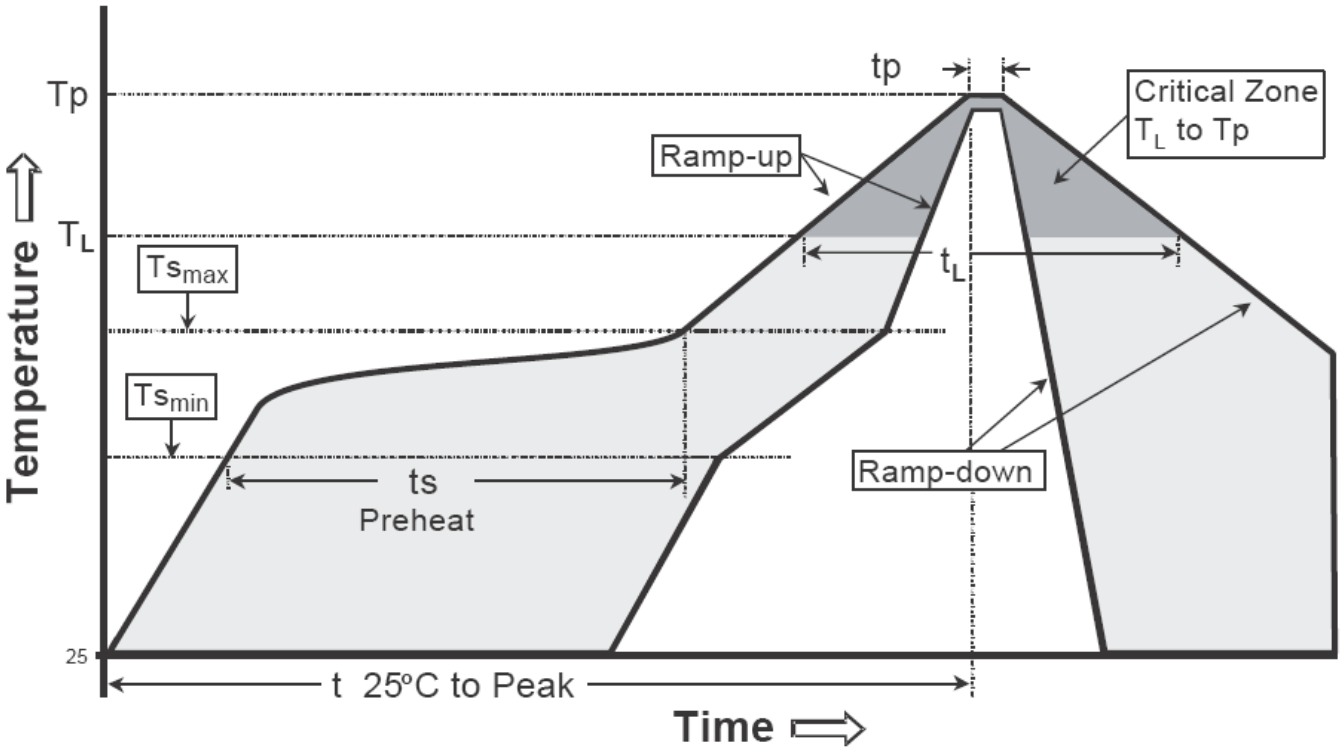
Carrier Tape Dimension



Recommended wave soldering condition

Product	Peak Temperature	Soldering Time
Pb-free devices	260 +0/-5 °C	5 +1/-1 seconds

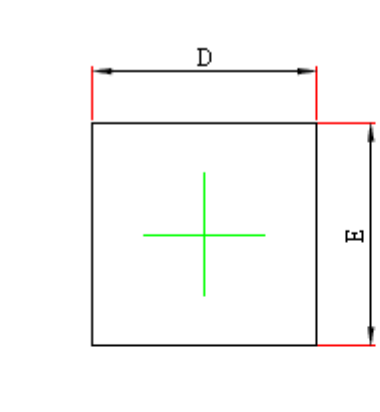
Recommended temperature profile for IR reflow

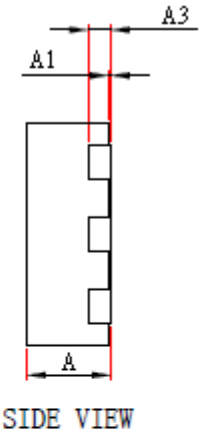


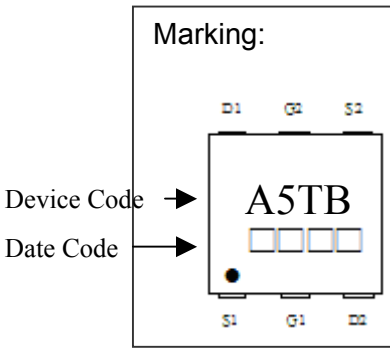
Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (T_L) − Time (t_L)	 183°C 60-150 seconds	 217°C 60-150 seconds
Peak Temperature(T_P)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(tp)	10-30 seconds	20-40 seconds
Ramp down rate	6°C/second max.	6°C/second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

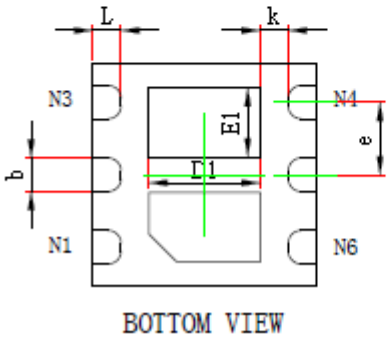
Note : All temperatures refer to topside of the package, measured on the package body surface.

DFN2x2-6L Dimension









Style:
Pin 1. Source1 (S1)
Pin 2. Gate 1 (G1)
Pin 3. Drain2 (D2)
Pin 4. Source2 (S2)
Pin 5. Gate2 (G2)
Pin 6. Drain1 (D1)

6-Lead DFN2x2-6L Plastic
Surface Mounted Package
CYStek Package Code: DFA6

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.700	0.800	0.028	0.031	E1	0.520	0.720	0.020	0.028
A1	0.000	0.050	0.000	0.002	k	0.200	-	0.008	-
A3	0.203 REF		0.008 REF		b	0.250	0.350	0.010	0.014
D	1.900	2.100	0.075	0.083	e	0.650 TYP		0.026 TYP	
E	1.900	2.100	0.075	0.083	L	0.200	0.300	0.008	0.012
D1	0.900	1.100	0.035	0.043					

Notes : 1.Controlling dimension : millimeters.
2.Maximum lead thickness includes lead finish thickness, and minimum lead thickness is the minimum thickness of base material.
3.If there is any question with packing specification or packing method, please contact your local CYStek sales office.

Material :

- Lead :Pure tin plated.
- Mold Compound : Epoxy resin family, flammability solid burning class:UL94V-0.

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