

**Dual N-Channel Enhancement Mode MOSFET**

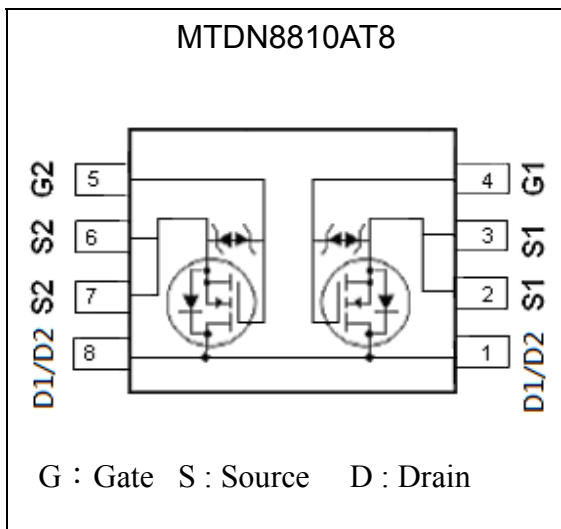
# MTDN8810AT8

BV <sub>DSS</sub>	20V
I <sub>D</sub> @T <sub>A</sub> =25°C, V <sub>GS</sub> =4.5V	5A
R <sub>DS(on)</sub> @V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A	17.5mΩ (typ)
R <sub>DS(on)</sub> @V <sub>GS</sub> =2.5V, I <sub>D</sub> =2.6A	25mΩ (typ)
R <sub>DS(on)</sub> @V <sub>GS</sub> =1.8V, I <sub>D</sub> =1A	41mΩ (typ)

**Features**

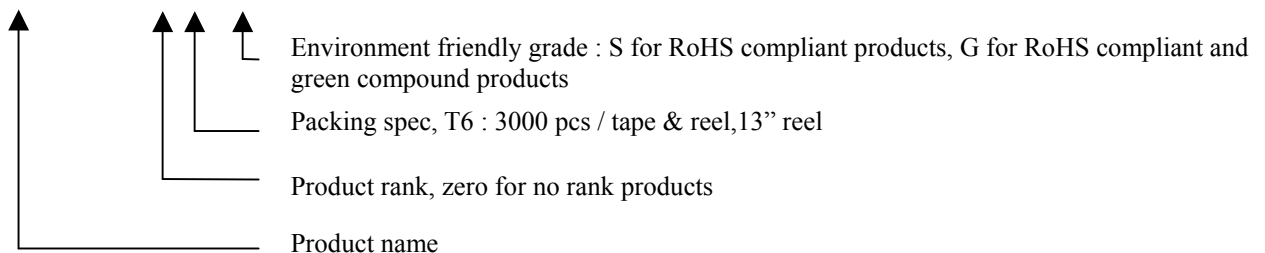
- 1.8V drive available
- Low on-resistance
- Fast switching speed
- Pb-free lead plating and halogen-free package

**Equivalent Circuit**



**Ordering Information**

Device	Package	Shipping
MTDN8810AT8-0-T6-G	TSSOP-8 (Pb-free lead plating and halogen-free package)	3000 pcs/ Tape & Reel





**Absolute Maximum Ratings (Ta=25°C)**

Parameter	Symbol	Limits	Unit
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	20	V
Gate-Source Voltage	V <sub>GS</sub>	±8	
Continuous Drain Current (Note 1)	I <sub>D</sub>	T <sub>A</sub> =25°C, V <sub>GS</sub> =4.5V	5
		T <sub>A</sub> =70°C, V <sub>GS</sub> =4.5V	4
Pulsed Drain Current (Note 2)	I <sub>DM</sub>	20	A
Total Power Dissipation (Note 1)	P <sub>D</sub>	T <sub>A</sub> =25°C	1
		T <sub>A</sub> =70°C	0.64
Operating Junction and Storage Temperature Range	T <sub>j</sub> ; T <sub>stg</sub>	-55~+150	°C
Thermal Resistance, Junction-to-Ambient (Note 1)	R <sub>th,ja</sub>	125	°C/W

Note : 1.Surface mounted on 1 in <sup>2</sup> copper pad of FR-4 board, t≤10sec. The value in any given application depends on the user's specific board design.  
 2.Pulse width ≤300μs, Duty Cycle≤2%

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

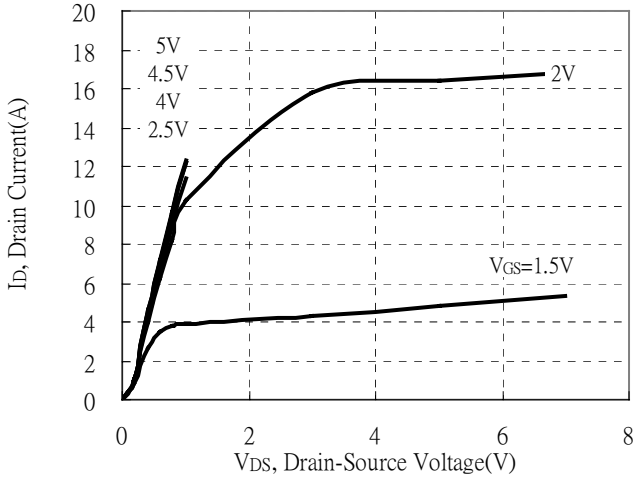
Symbol	Min.	Typ.	Max.	Unit	Test Conditions
<b>Static</b>					
BV <sub>DSS</sub>	20	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250μA
V <sub>GS(th)</sub>	0.4	0.75	1.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA
I <sub>GSS</sub>	-	-	±20	μA	V <sub>GS</sub> =±8V, V <sub>DS</sub> =0
I <sub>DSS</sub>	-	-	1		V <sub>DS</sub> =20V, V <sub>GS</sub> =0
	-	-	25		V <sub>DS</sub> =16V, V <sub>GS</sub> =0, T <sub>j</sub> =125°C
*R <sub>DS(ON)</sub>	-	17.5	28	mΩ	I <sub>D</sub> =5A, V <sub>GS</sub> =4.5V
	-	25	40		I <sub>D</sub> =2.6A, V <sub>GS</sub> =2.5V
	-	41	60		I <sub>D</sub> =1A, V <sub>GS</sub> =1.8V
*G <sub>FS</sub>	-	10	-	S	V <sub>DS</sub> =5V, I <sub>D</sub> =5A
<b>Dynamic</b>					
C <sub>iss</sub>	-	509	-	pF	V <sub>DS</sub> =10V, V <sub>GS</sub> =0, f=1MHz
C <sub>oss</sub>	-	100	-		
C <sub>rss</sub>	-	81	-		
*t <sub>d(ON)</sub>	-	5	-	ns	V <sub>DD</sub> =10V, I <sub>D</sub> =1A, V <sub>GS</sub> =4.5V, R <sub>G</sub> =6Ω
*t <sub>r</sub>	-	11	-		
*t <sub>d(OFF)</sub>	-	22	-		
*t <sub>f</sub>	-	18	-		
*Q <sub>g</sub>	-	7	-	nC	V <sub>DS</sub> =10V, V <sub>GS</sub> =4.5V, I <sub>D</sub> =5A
*Q <sub>gs</sub>	-	0.9	-		
*Q <sub>gd</sub>	-	2.4	-		
<b>Source Drain Diode</b>					
*I <sub>S</sub>	-	-	5	A	
*I <sub>SM</sub>	-	-	20		
*V <sub>SD</sub>	-	0.77	1.2	V	V <sub>GS</sub> =0V, I <sub>S</sub> =1.2A
*t <sub>rr</sub>	-	14	-	ns	I <sub>F</sub> =5A, dI <sub>F</sub> /dt=100A/μs
*Q <sub>rr</sub>	-	7	-	nC	

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

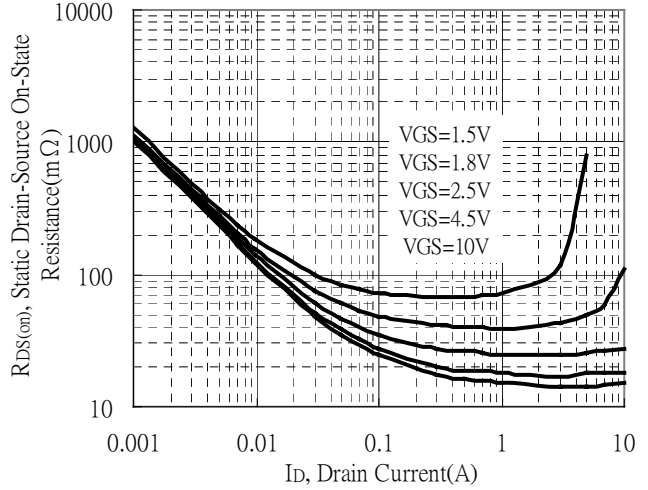


**Typical Characteristics**

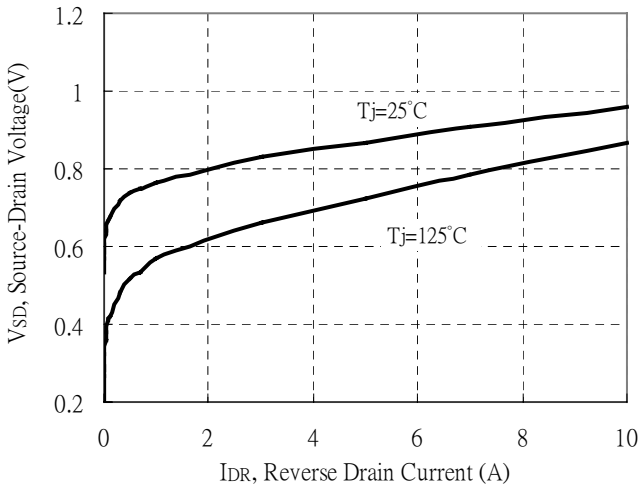
Typical Output Characteristics



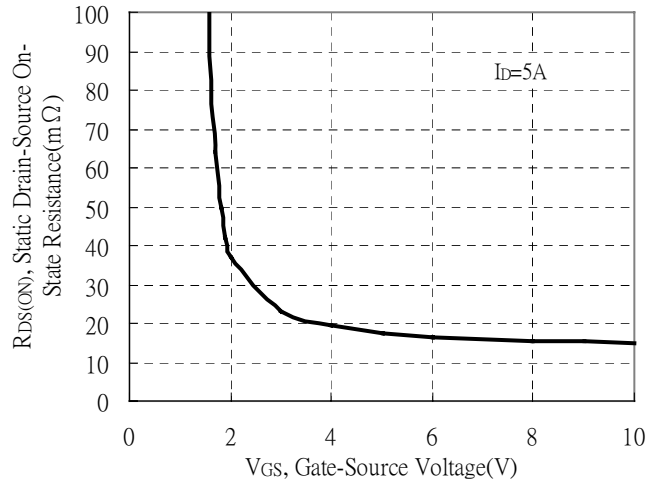
Static Drain-Source On-State resistance vs Drain Current



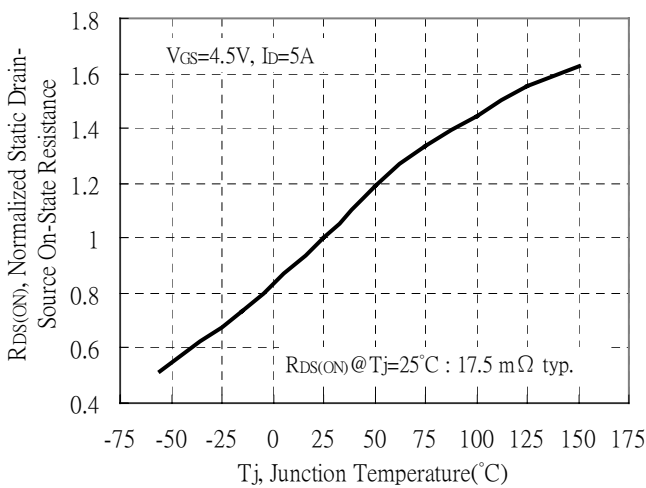
Reverse Drain Current vs Source-Drain Voltage



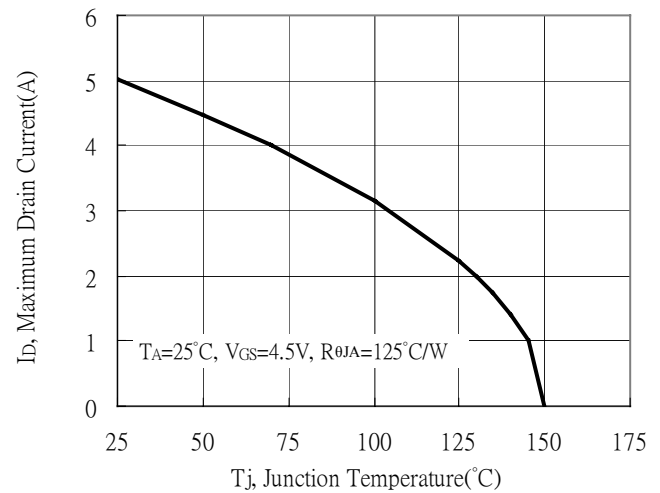
Static Drain-Source On-State Resistance vs Gate-Source Voltage



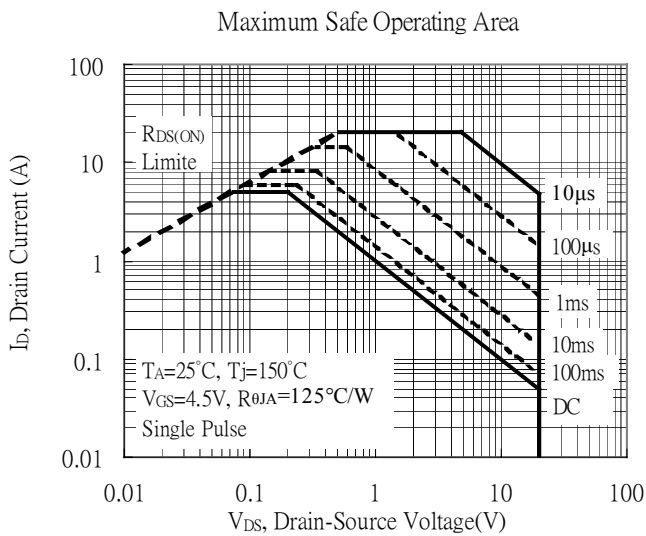
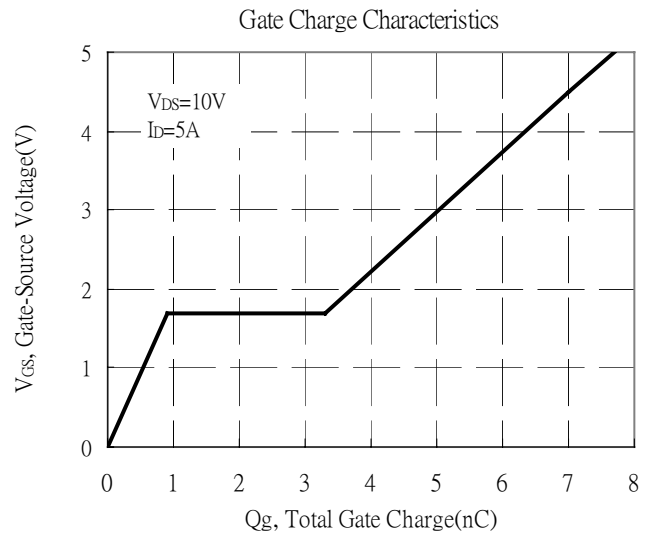
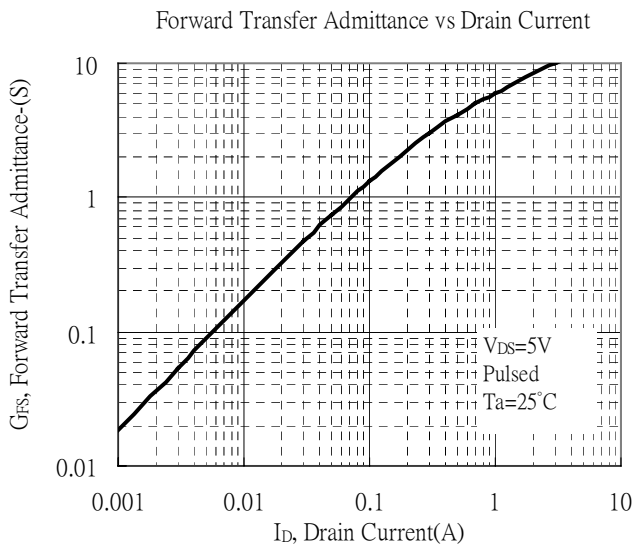
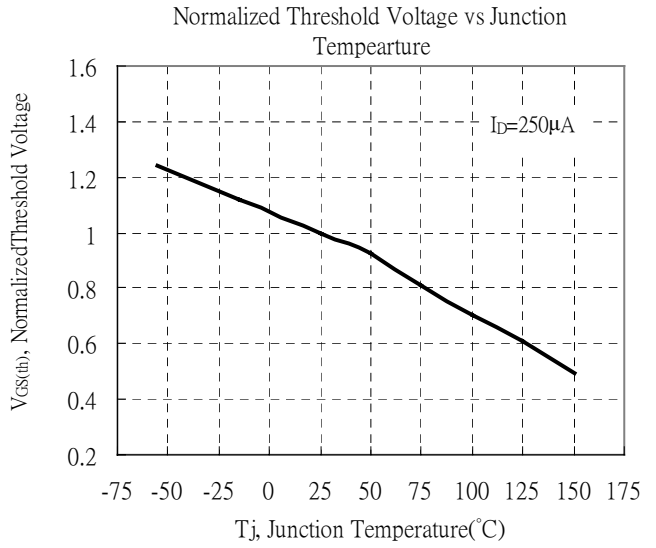
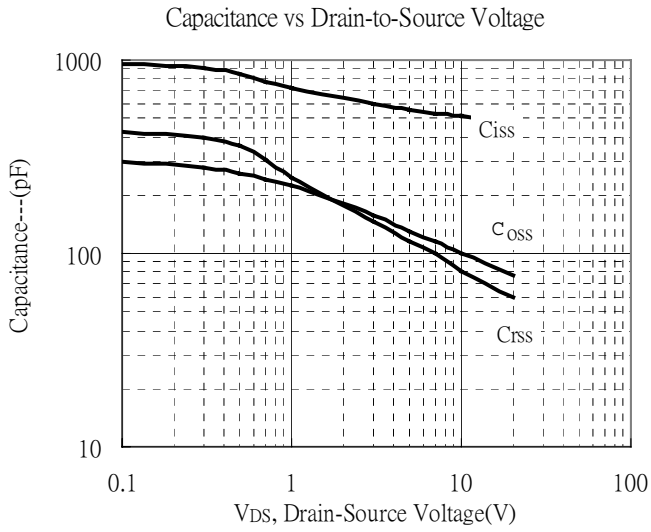
Drain-Source On-State Resistance vs Junction Temperature



Maximum Drain Current vs Junction Temperature

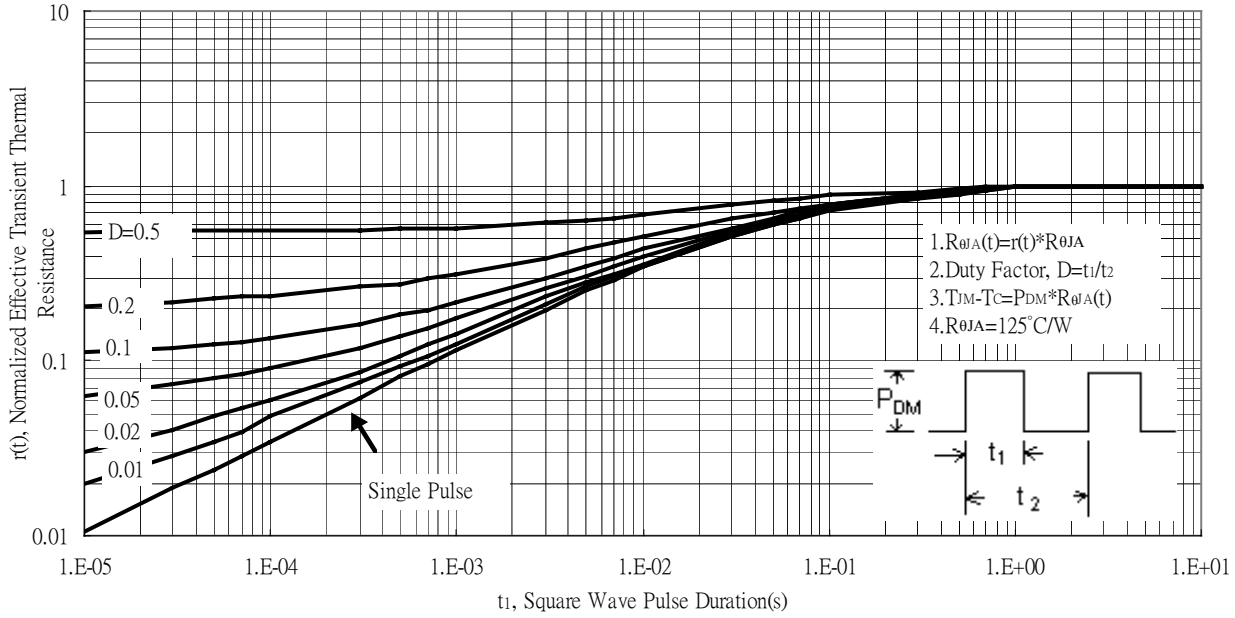


**Typical Characteristics(Cont.)**

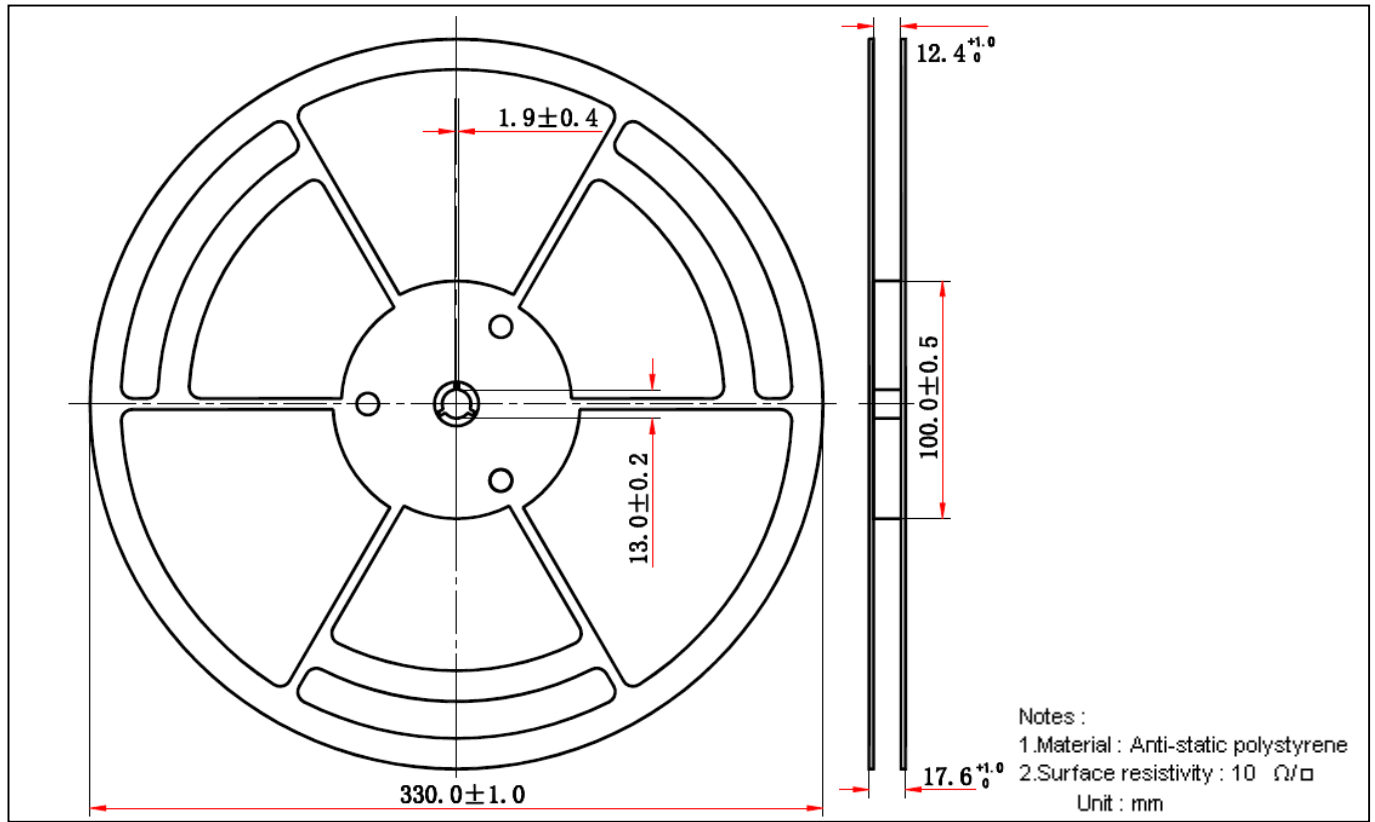


**Typical Characteristics(Cont.)**

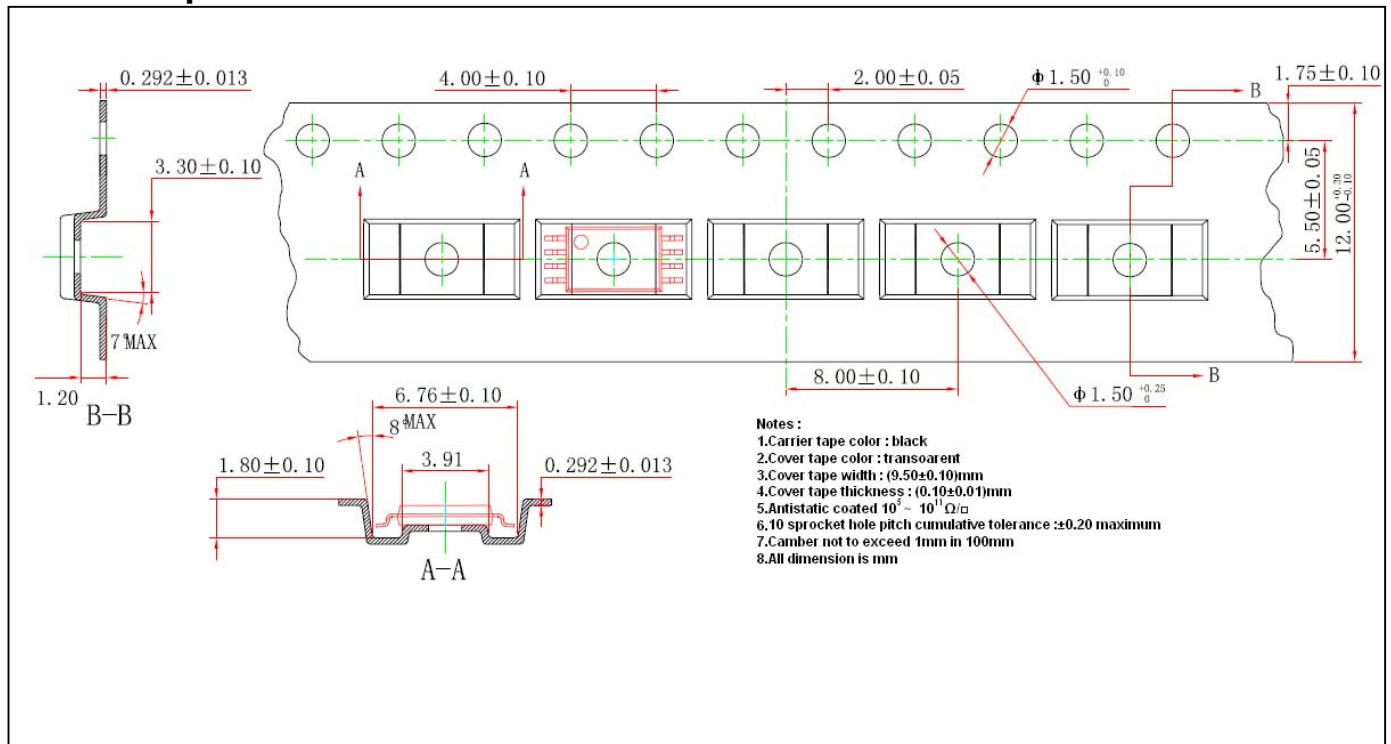
Transient Thermal Response Curves



**Reel Dimension**



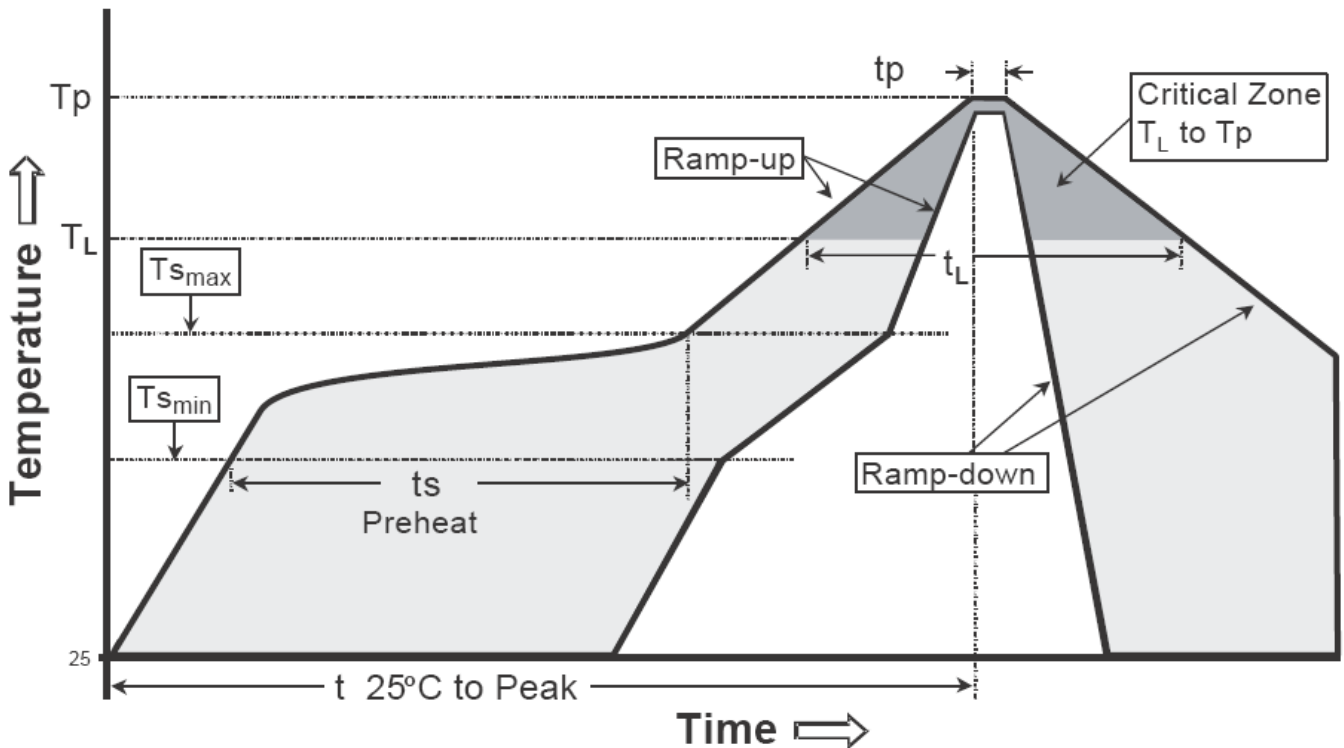
**Carrier Tape Dimension**



**Recommended wave soldering condition**

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

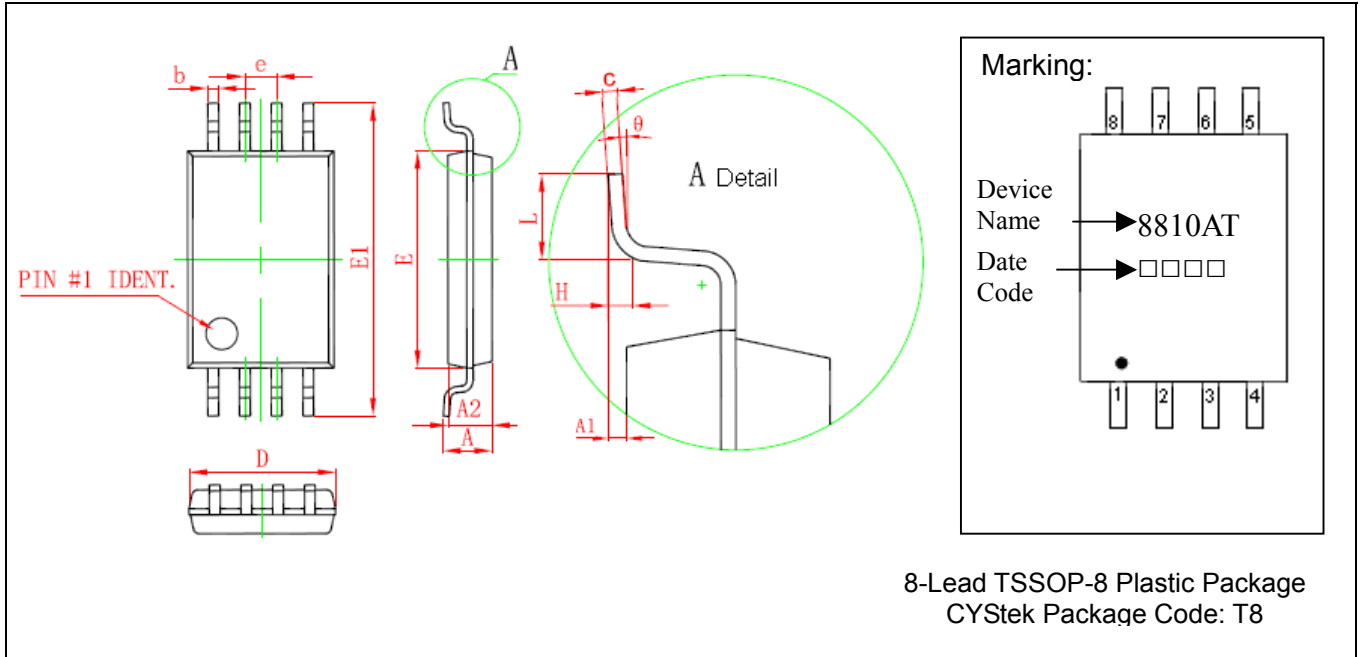
**Recommended temperature profile for IR reflow**



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T <sub>s min</sub> )	100°C	150°C
-Temperature Max(T <sub>s max</sub> )	150°C	200°C
-Time(t <sub>s min</sub> to t <sub>s max</sub> )	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T <sub>L</sub> )	183°C	217°C
- Time (t <sub>L</sub> )	60-150 seconds	60-150 seconds
Peak Temperature(T <sub>P</sub> )	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.

**TSSOP-8 Dimension**



\*: Typical

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	-	1.200	-	0.047	E	4.300	4.500	0.169	0.177
A1	0.020	0.150	0.001	0.006	E1	6.250	6.550	0.246	0.258
A2	0.800	1.000	0.031	0.039	e	0.650 (BSC)		0.026 (BSC)	
b	0.190	0.300	0.007	0.012	L	0.500	0.700	0.020	0.028
c	0.090	0.200	0.004	0.008	H	0.250*		0.010*	
D	2.900	3.100	0.114	0.122	θ	1°	7°	1°	7°

- 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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