Dual N-Channel Enhancement Mode MOSFET

MTDN8810T8

BV_{DSS}	20V
I_D	5A
R_{DSON}@V_{GS}=4.5V, I_D=5A	17.5mΩ(typ)
R_{DSON}@V_{GS}=2.5V,I_D=2.6A	25mΩ(typ)
R_{DSON}@V_{GS}=1.8V,I_D=1A	41mΩ(typ)

Description

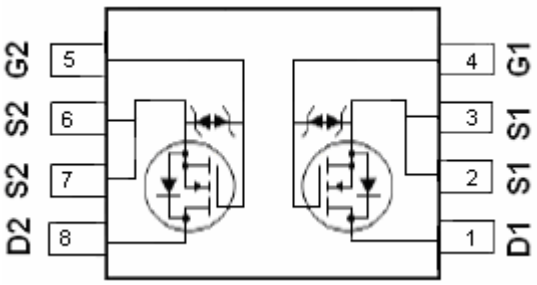
The MTDN8810T8 is a dual N-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness and is suitable for applications such as power management of portable device.
The TSSOP-8 package is universally preferred for all commercial-industrial surface mount applications.

Features

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

Equivalent Circuit

MTDN8810T8



G：Gate S : Source D : Drain

Ordering Information

Device	Package	Shipping	Marking
MTDN8810T8	TSSOP-8 (Pb-free lead plating package)	3000 pcs/ Tape & Reel	8810TS

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Breakdown Voltage		BV_{DSS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current (Note 1)	T_A=25°C	I_D	5	A
	T_A=70°C		4	
Pulsed Drain Current (Note 2)		I_{DM}	20	
Total Power Dissipation (Note 1)	T_A=25°C	P_D	1	W
	T_A=70°C		0.64	
Operating Junction and Storage Temperature Range		Tj ; Tstg	-55~+150	°C
Thermal Resistance, Junction-to-Ambient (Note 1)		Rth,ja	125	°C/W

Note : 1.Surface mounted on 1 in ² 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%

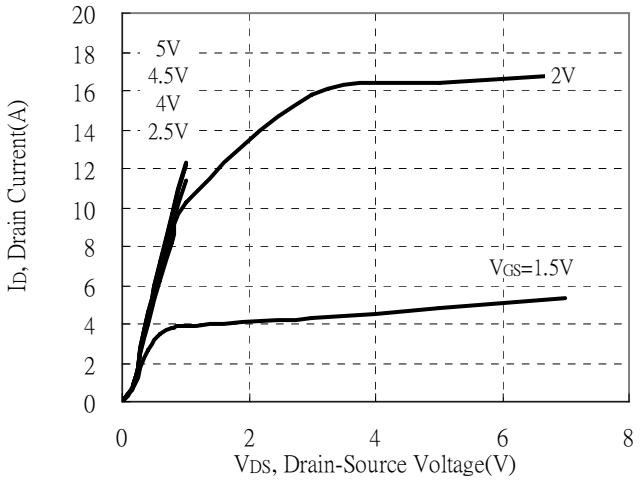
Electrical Characteristics (Tj=25°C, unless otherwise specified)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	20	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	0.4	0.75	1.0	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±20	μA	V_{GS}=±8V, V_{DS}=0
I_{DSS}	-	-	1		V_{DS}=20V, V_{GS}=0
	-	-	25		V_{DS}=16V, V_{GS}=0, Tj=125°C
*$R_{DS(ON)}$	-	17.5	28	mΩ	I_D=5A, V_{GS}=4.5V
	-	25	40		I_D=2.6A, V_{GS}=2.5V
	-	41	60		I_D=1A, V_{GS}=1.8V
*G_{FS}	-	10	-	S	V_{DS}=5V, I_D=5A
Dynamic					
Ciss	-	509	-	pF	V_{DS}=10V, V_{GS}=0, f=1MHz
Coss	-	100	-		
Crss	-	81	-		
*$t_{d(ON)}$	-	5	-	ns	V_{DD}=10V, I_D=1A, V_{GS}=4.5V, R_G=6Ω
*t_r	-	11	-		
*$t_{d(OFF)}$	-	22	-		
*t_f	-	18	-		
*Qg	-	7	-	nC	V_{DS}=10V, V_{GS}=4.5V, I_D=5A
*Qgs	-	0.9	-		
*Qgd	-	2.4	-		
Source Drain Diode					
*I_S	-	-	5	A	
*I_{SM}	-	-	20		
*V_{SD}	-	0.77	1.2	V	V_{GS}=0V, I_S=1.2A
*trr	-	14	-	ns	I_F=5A, dI_F/dt=100A/μs
*Qrr	-	7	-	nC	

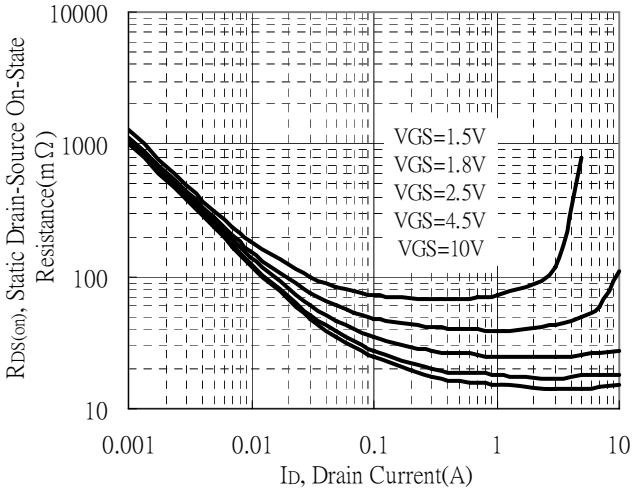
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Typical Characteristics

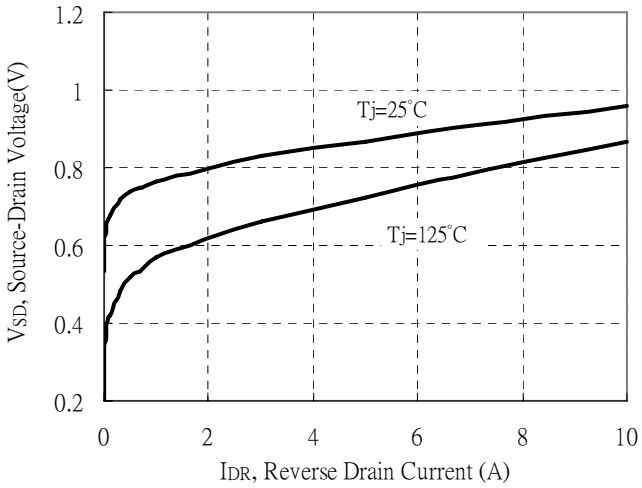
Typical Output Characteristics



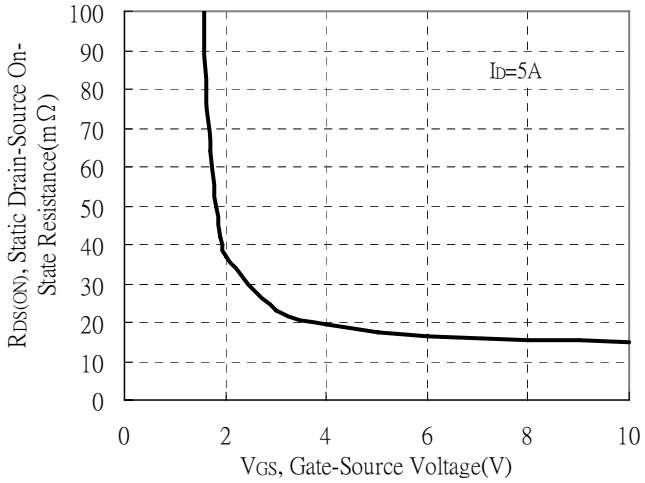
Static Drain-Source On-State resistance vs Drain Current



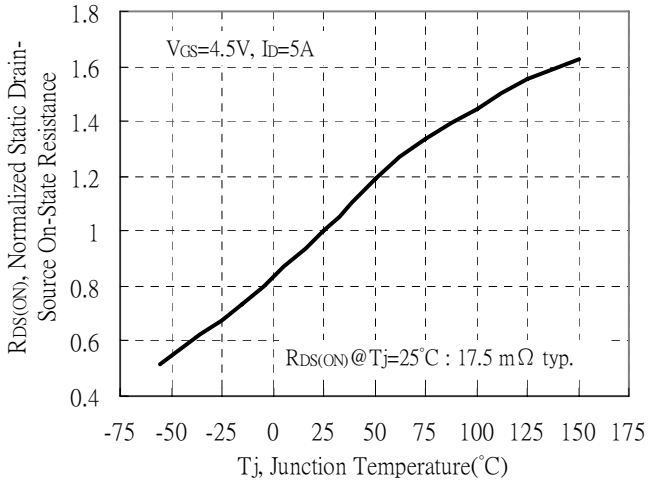
Reverse Drain Current vs Source-Drain Voltage



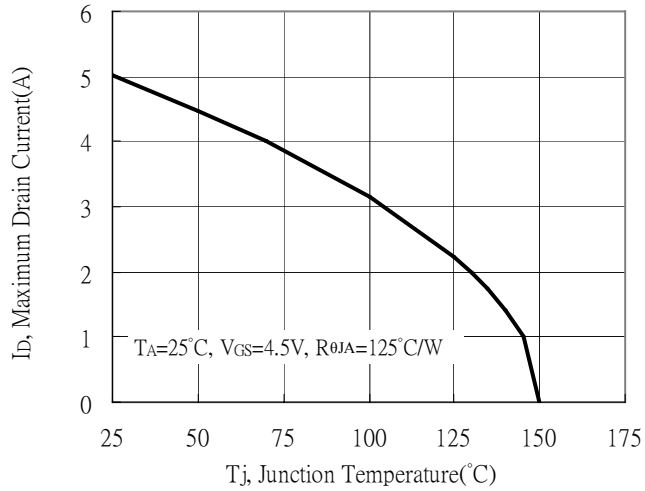
Static Drain-Source On-State Resistance vs Gate-Source Voltage



Drain-Source On-State Resistance vs Junction Tempearture

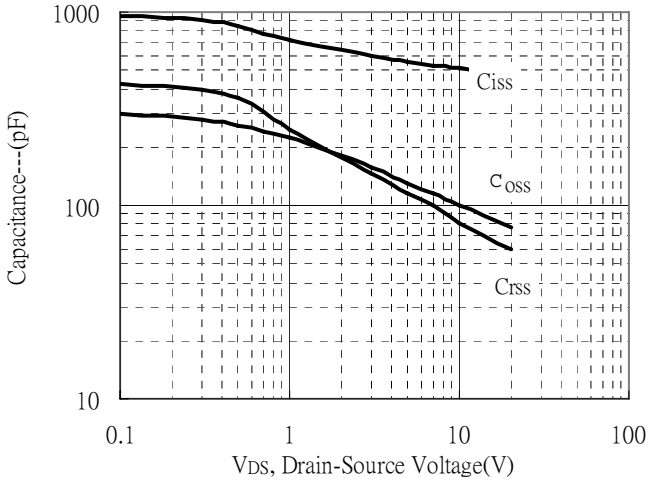


Maximum Drain Current vs Junction Temperature

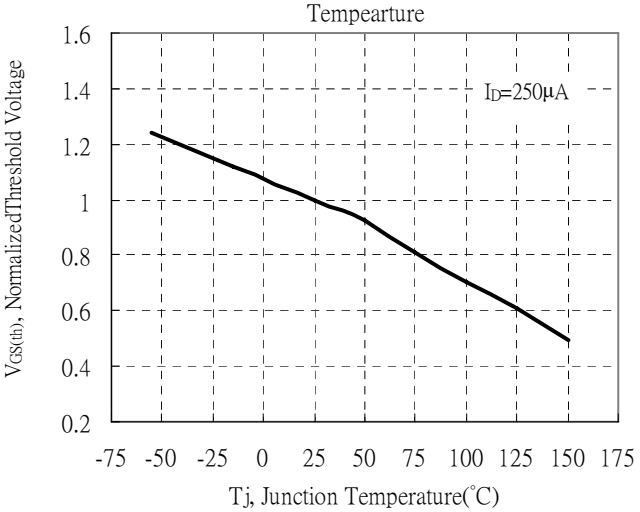


Typical Characteristics(Cont.)

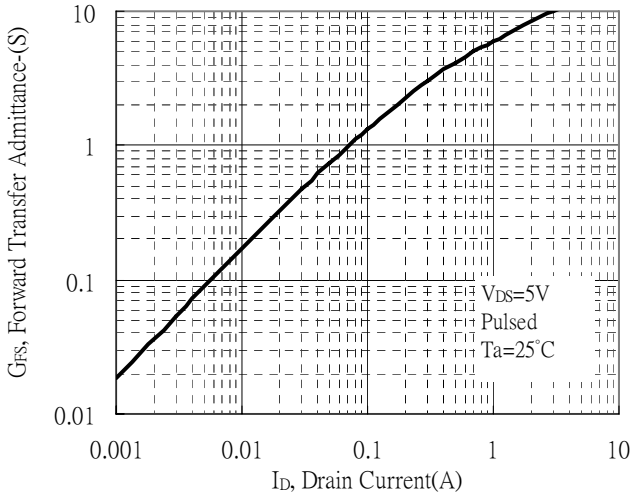
Capacitance vs Drain-to-Source Voltage



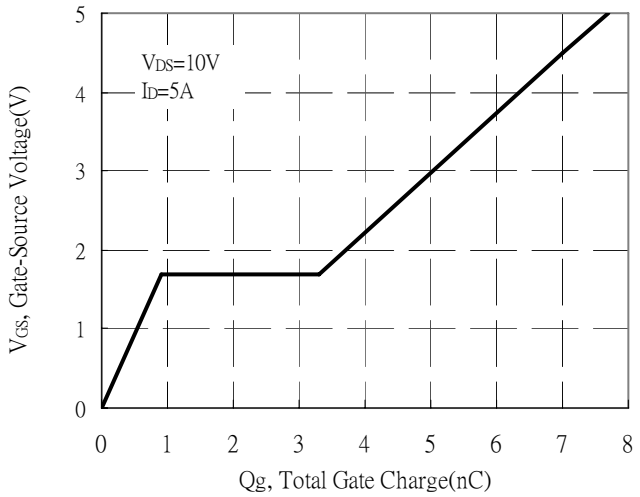
Normalized Threshold Voltage vs Junction Tempearture



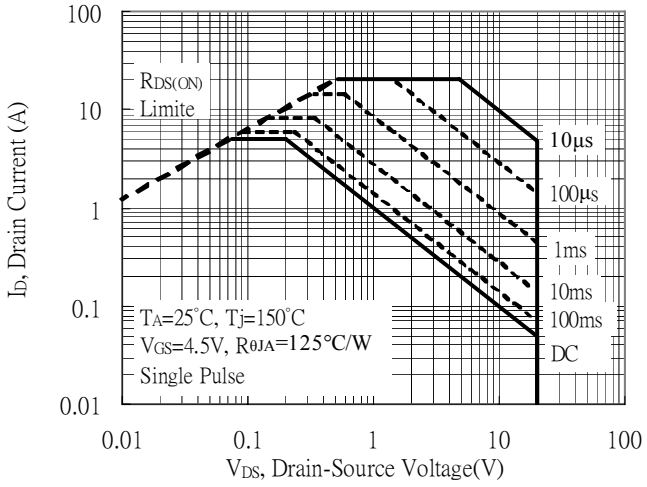
Forward Transfer Admittance vs Drain Current



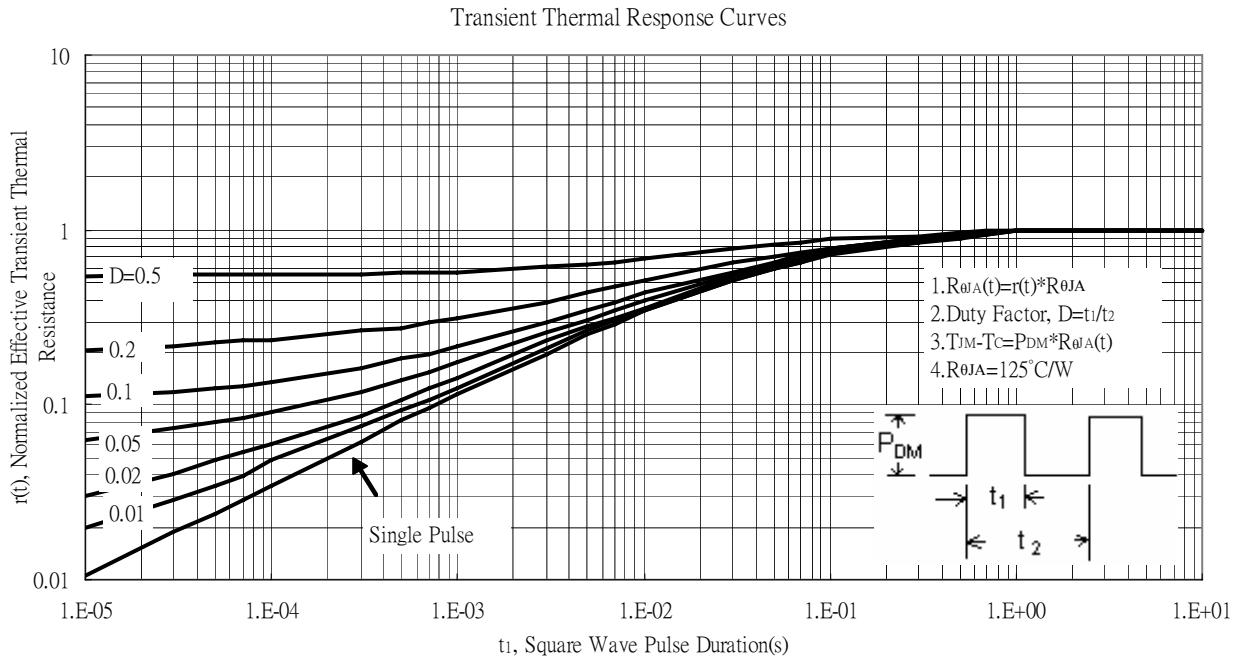
Gate Charge Characteristics



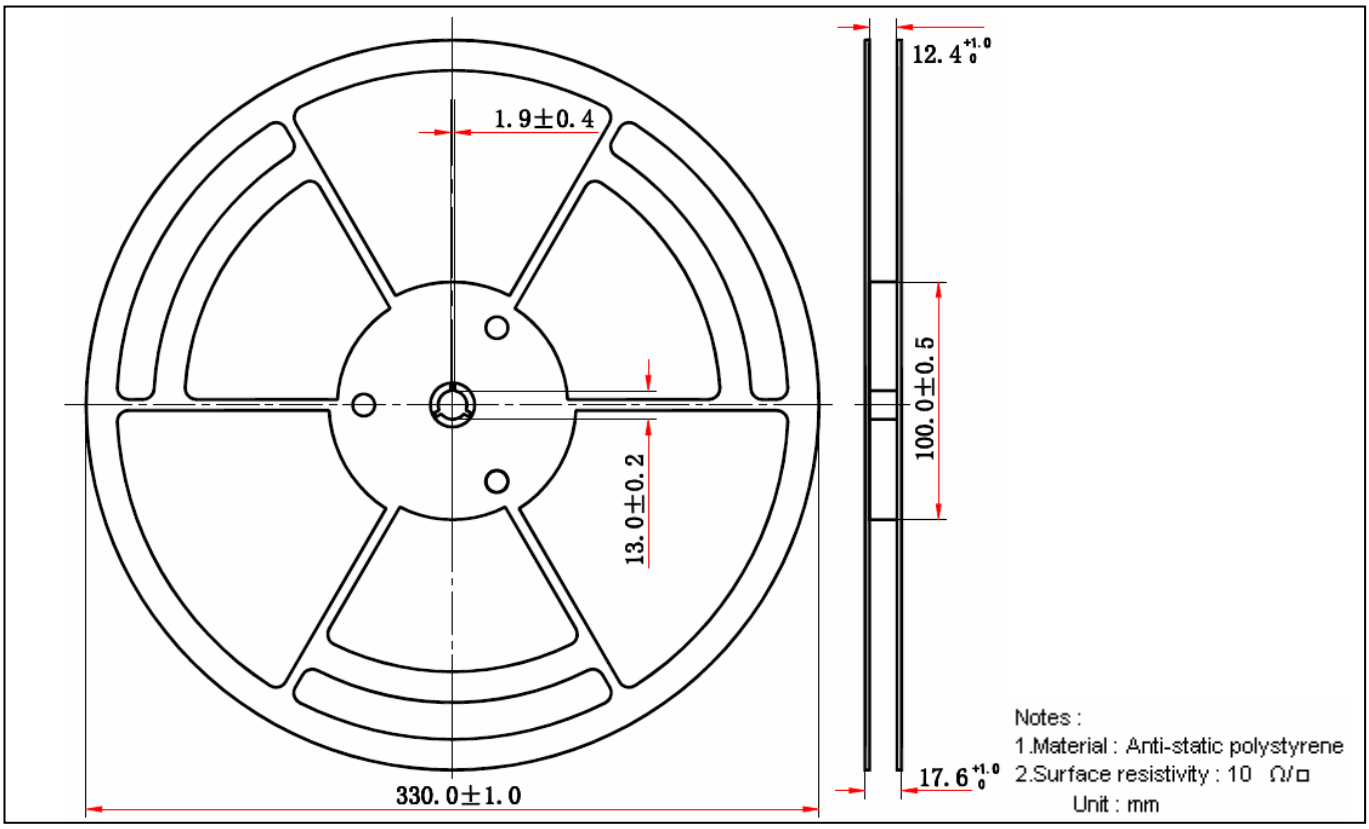
Maximum Safe Operating Area



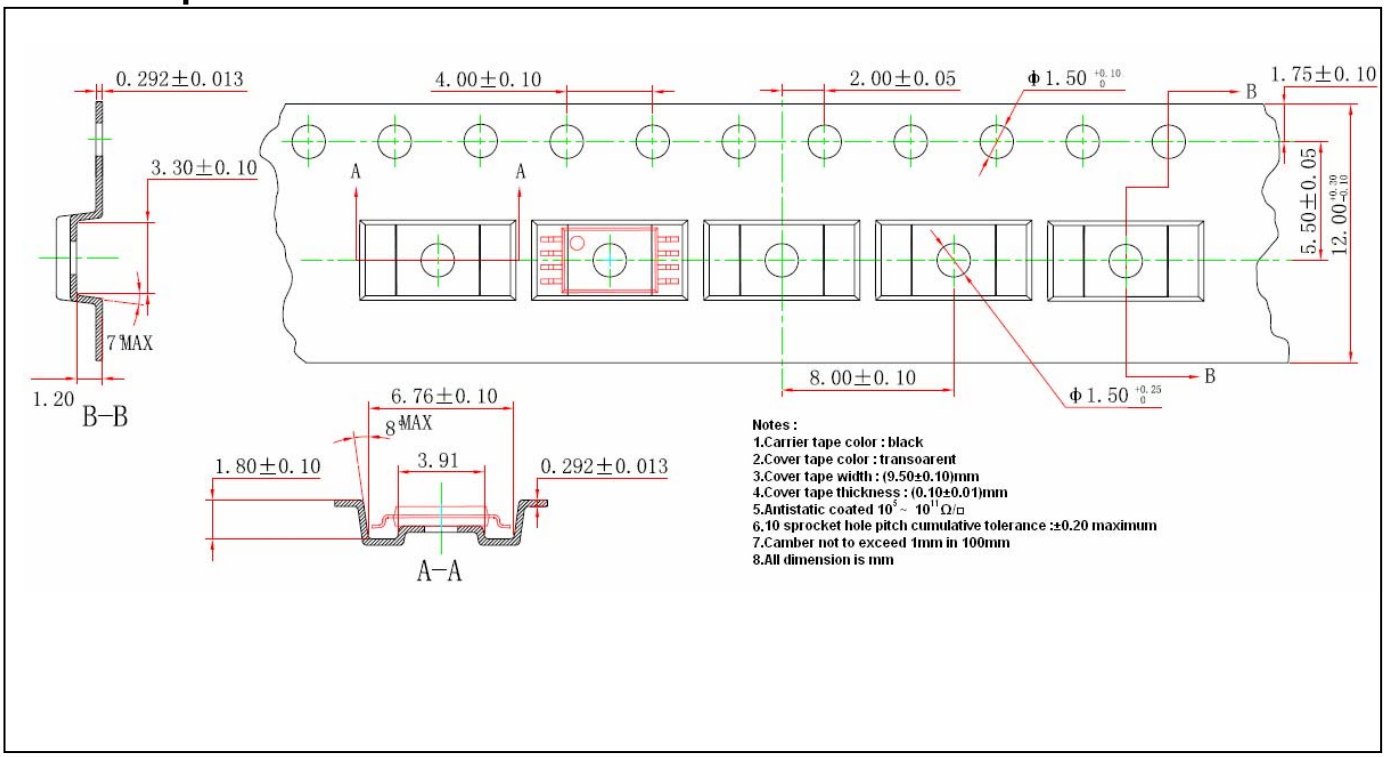
Typical Characteristics(Cont.)



Reel Dimension



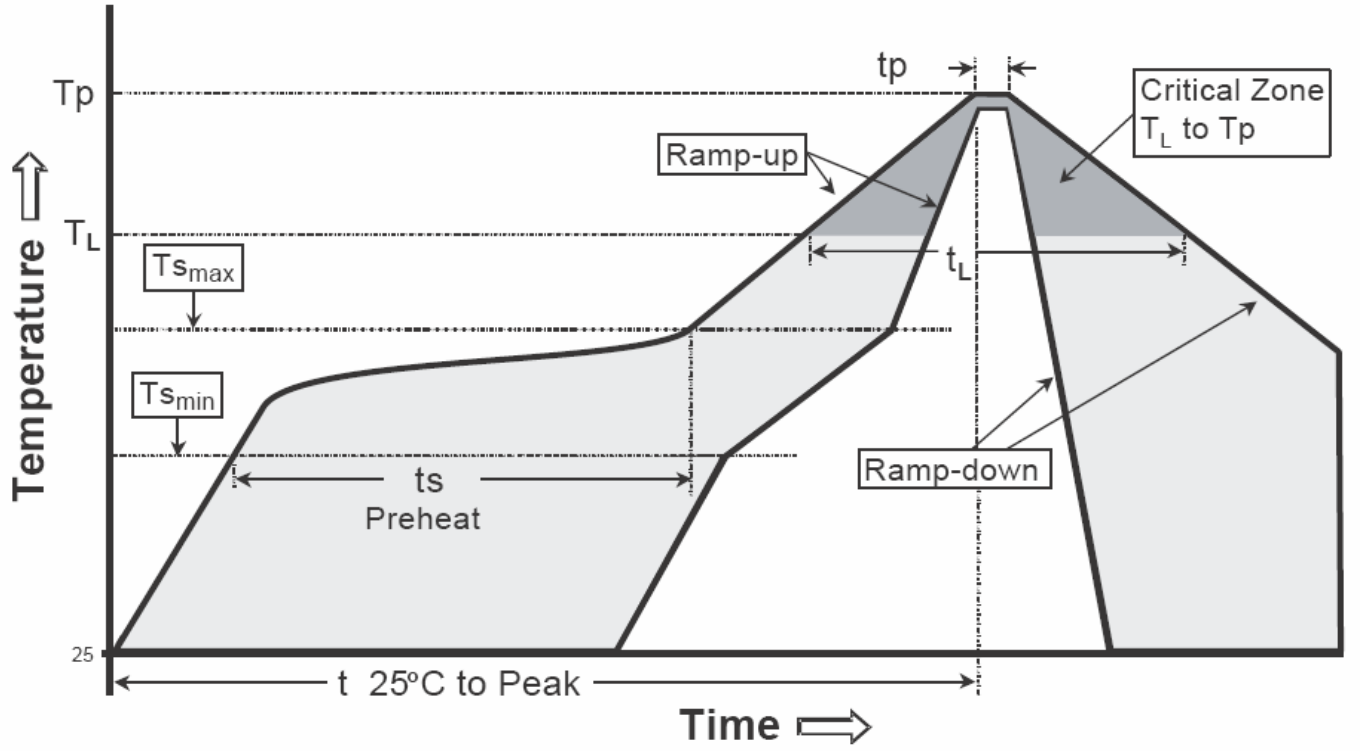
Carrier Tape Dimension



Recommended wave soldering condition

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

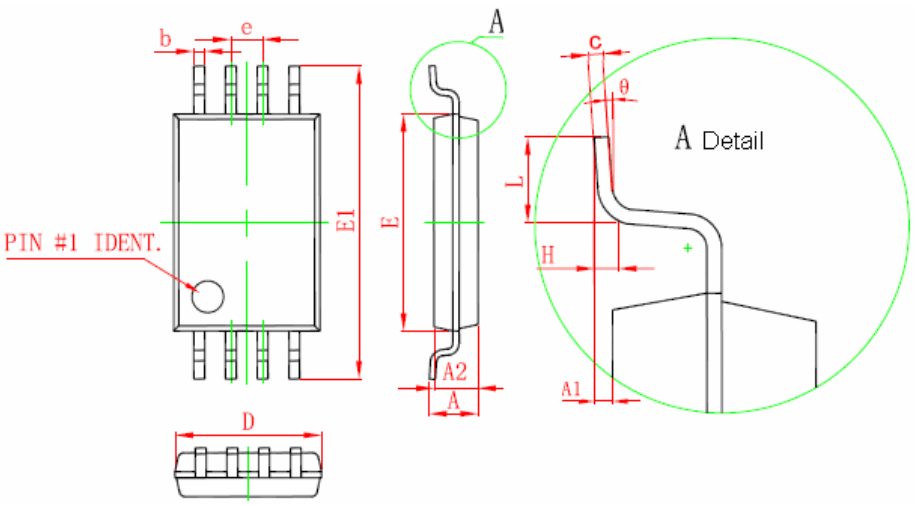
Recommended temperature profile for IR reflow

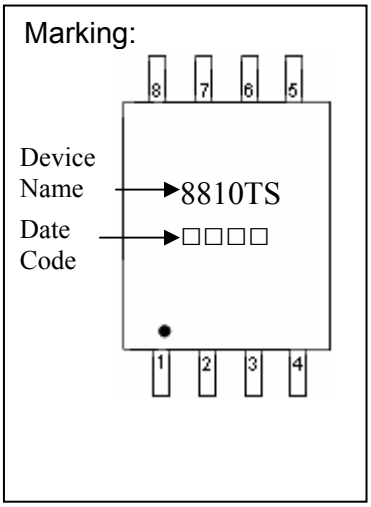


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(T_S min) −Temperature Max(T_S max) −Time($t_{s\ min}$ to $t_{s\ max}$)	 100°C 150°C 60-120 seconds	 150°C 200°C 60-180 seconds
Time maintained above: −Temperature (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.

TSSOP-8 Dimension





8-Lead TSSOP-8 Plastic Package
CYStek Package Code: T8

*: 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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