P-Channel Enhancement Mode Power MOSFET

MTEF1P15N6

Description

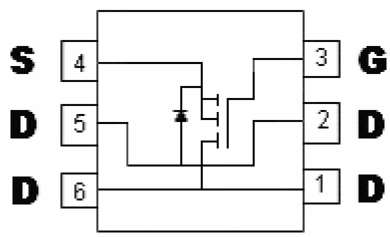
The MTEF1P15N6 is a P-channel enhancement-mode MOSFET, providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness.
The SOT-26 package is universally preferred for all commercial-industrial surface mount applications.

Features

- Simple drive requirement
- Low on-resistance
- Small package outline
- Pb-free lead plating package

Equivalent Circuit

MTEF1P15N6



G：Gate　S：Source　D：Drain

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V_{DS}	-150	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C=25 °C	I_D	-1.4	A
	T_C=70 °C		-1.1	
	T_A=25 °C (Note 1)		-1.1	
	T_A=70 °C (Note 1)		-0.88	
Pulsed Drain Current (Note 2, 3)		I_{DM}	-5.6	
Total Power Dissipation	T_C=25 °C	P_D	3.2	W
	T_C=70 °C		2.1	
	T_A=25 °C		2	
	T_A=70 °C		1.25	
Operating Junction Temperature and Storage Temperature Range		Tj, Tstg	-55~+150	°C

Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	39	°C/W
Thermal Resistance, Junction-to-ambient, max (Note 1)	$R_{\theta JA}$	62.5	

Note : 1.Surface mounted on 1 in² copper pad of FR-4 board, t≤5 sec. 156℃/W when mounted on minimum copper pad.
2.Pulse width limited by maximum junction temperature.
3.Pulse Width ≤300μs, Duty Cycle≤2%

Electrical Characteristics (Ta=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	-150	-	-	V	V_{GS}=0, I_D=-250μA
$\Delta BV_{DSS}/\Delta Tj$	-	-0.1	-	V/℃	Reference to 25℃, I_D=-250μA
$V_{GS(th)}$	-2	-2.8	-3.5	V	V_{DS}=V_{GS}, I_D=-250μA
I_{GSS}	-	-	±100	nA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	-100	nA	V_{DS}=-120V, V_{GS}=0, Tj=25℃
	-	-	-10	μA	V_{DS}=-120V, V_{GS}=0, Tj=55℃
*$R_{DS(ON)}$	-	661	820	mΩ	I_D=-1.4A, V_{GS}=-10V
	-	724	850		I_D=-1A, V_{GS}=-6V
*G_{FS}	-	2.5	-	S	V_{DS}=-10V, I_D=-1.4A
Dynamic					
Ciss	-	471	-	pF	V_{DS}=-30V, V_{GS}=0, f=1MHz
Coss	-	28	-		
Crss	-	11	-		
$t_{d(ON)}$	-	8	-	ns	V_{DS}=-75V, I_D=-1A, V_{GS}=-10V, R_G=1Ω
t_r	-	6	-		
$t_{d(OFF)}$	-	20	-		
t_f	-	4	-		
Qg	-	6	-	nC	V_{DS}=-75V, I_D=-1A, V_{GS}=-10V,
Qgs	-	2	-		
Qgd	-	1.4	-		
Source-Drain Diode					
*I_S	-	-	-1.4	A	
*I_{SM}	-	-	-5		
*V_{SD}	-	-0.77	-1.2	V	I_S=-1A,V_{GS}=0V
*T_{rr}	-	60	-	ns	I_S=-1A,V_{GS}=0V,dI/dt=100A/μs
Q_{rr}	-	120	-	nC	

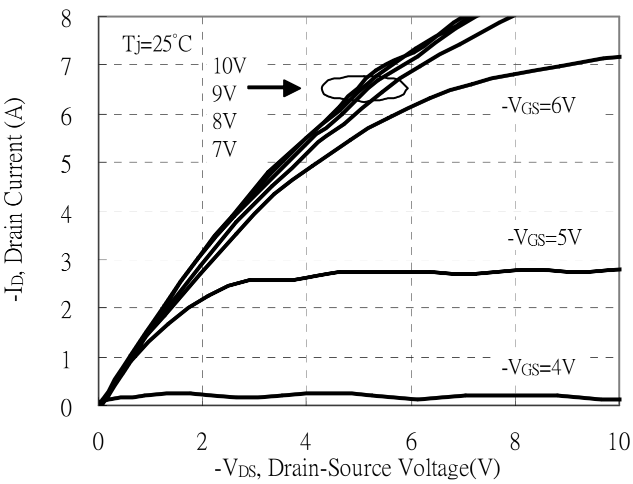
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

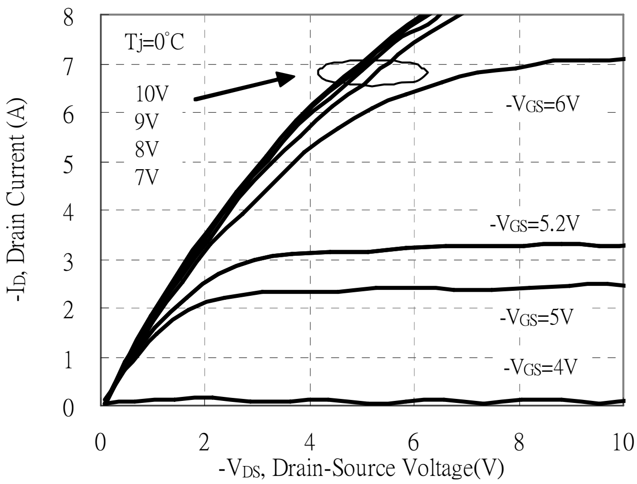
Device	Package	Shipping
MTEF1P15N6-0-T1-G	SOT-26 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Typical Characteristics

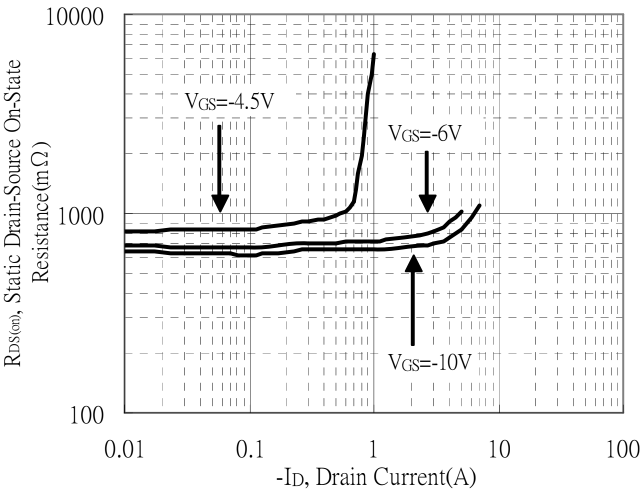
Typical Output Characteristics



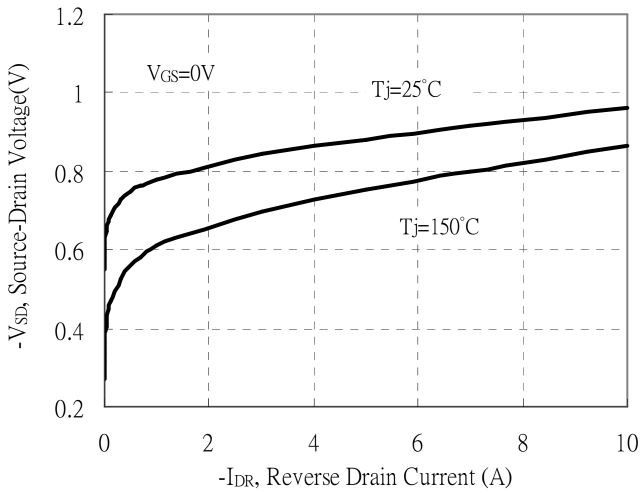
Typical Output Characteristics



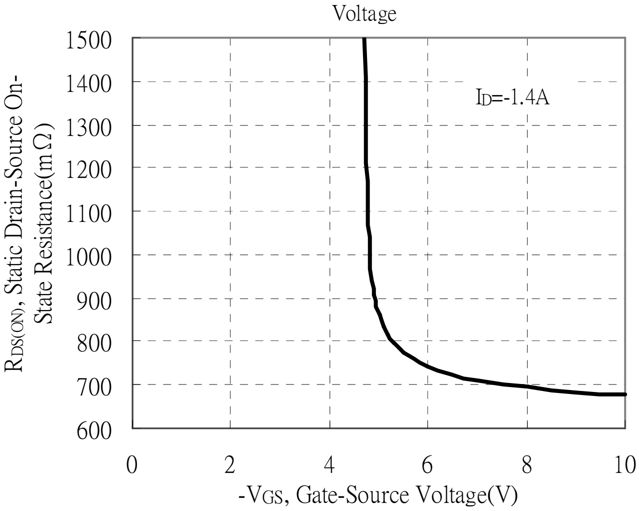
Static Drain-Source On-State resistance vs Drain Current



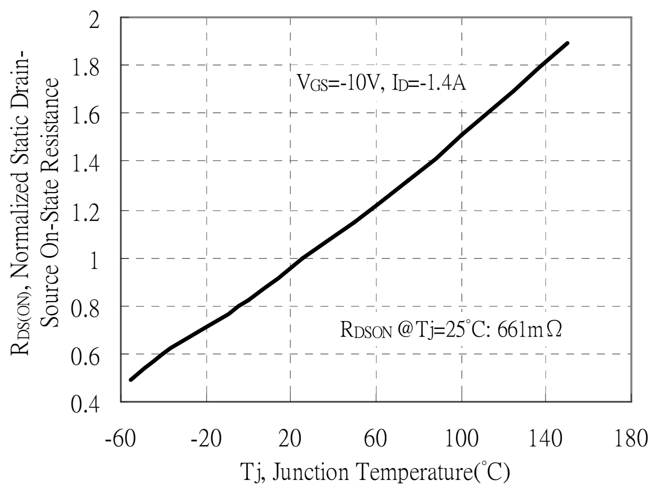
Reverse Drain Current vs Source-Drain Voltage



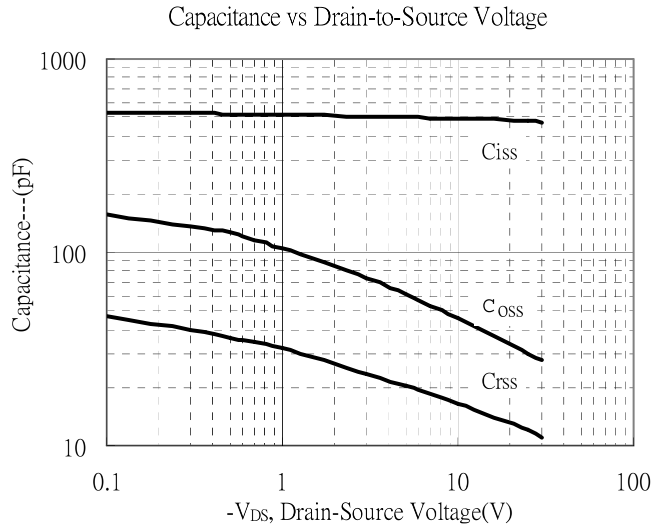
Static Drain-Source On-State Resistance vs Gate-Source Voltage

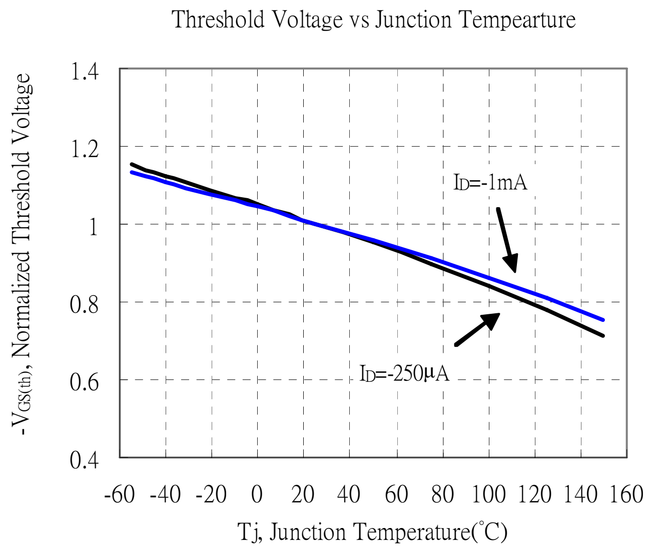


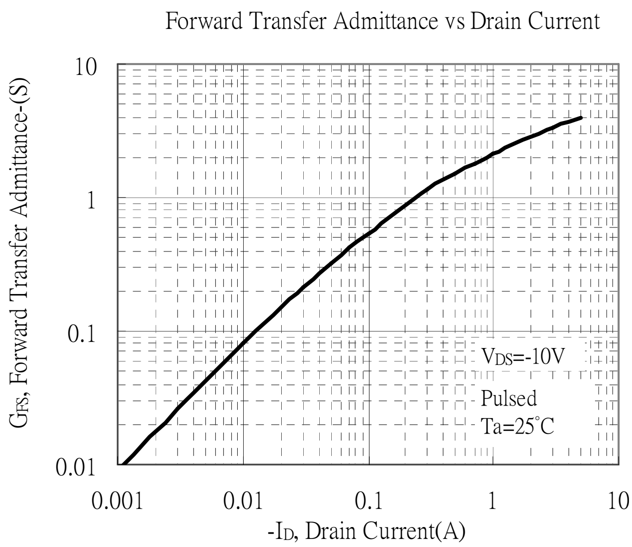
Drain-Source On-State Resistance vs Junction Tempearture

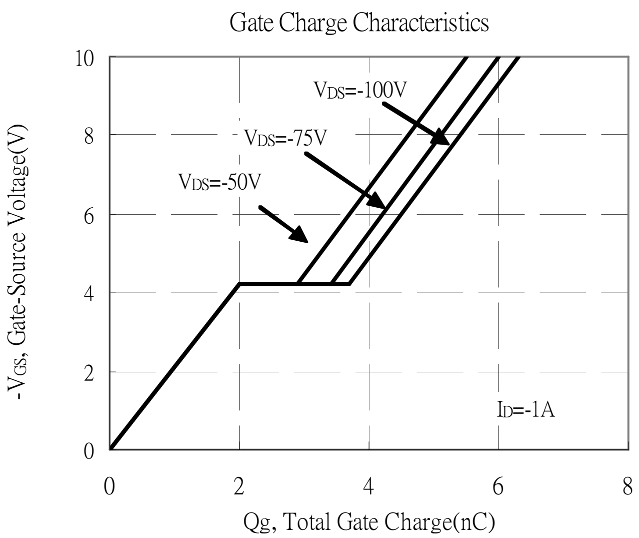


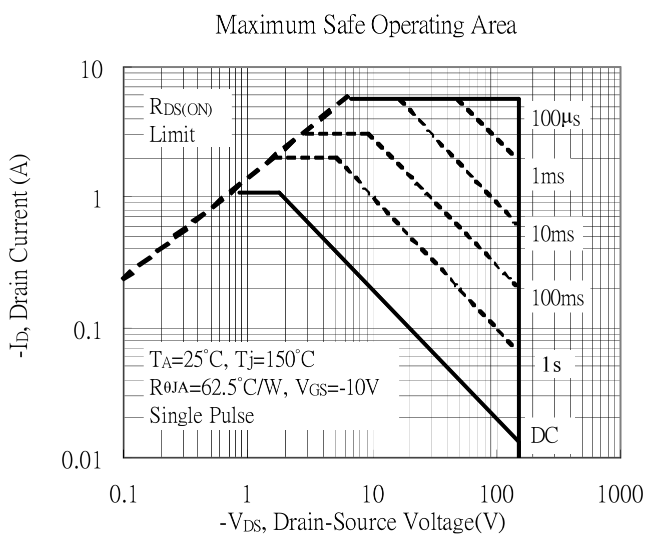
Typical Characteristics(Cont.)

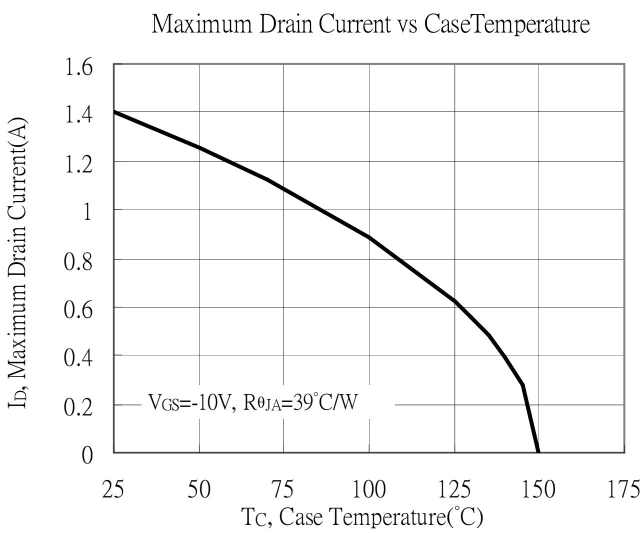




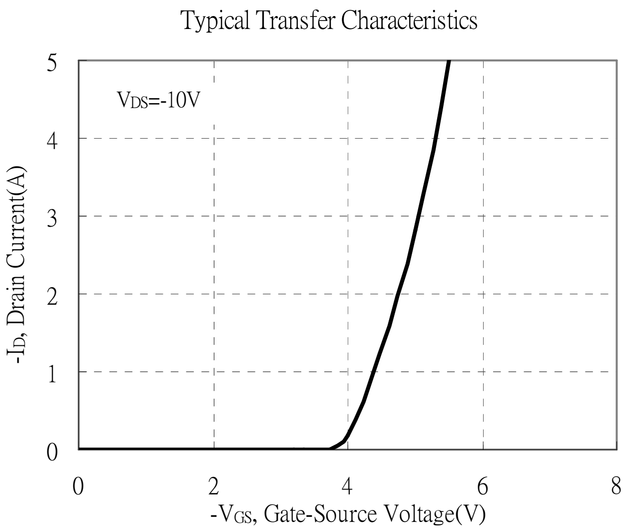


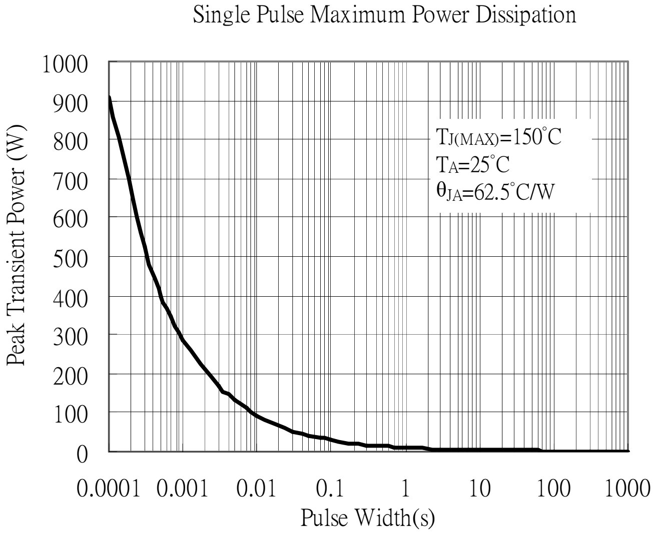


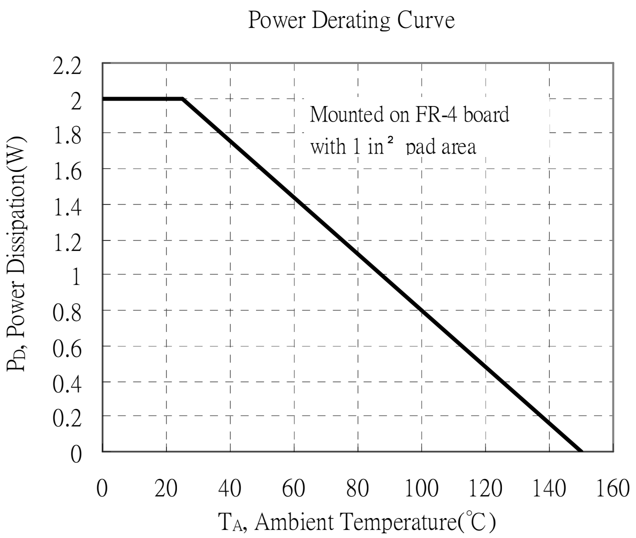


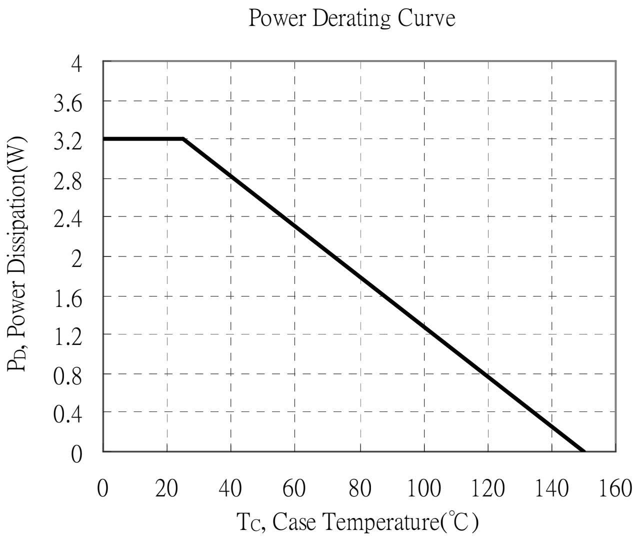


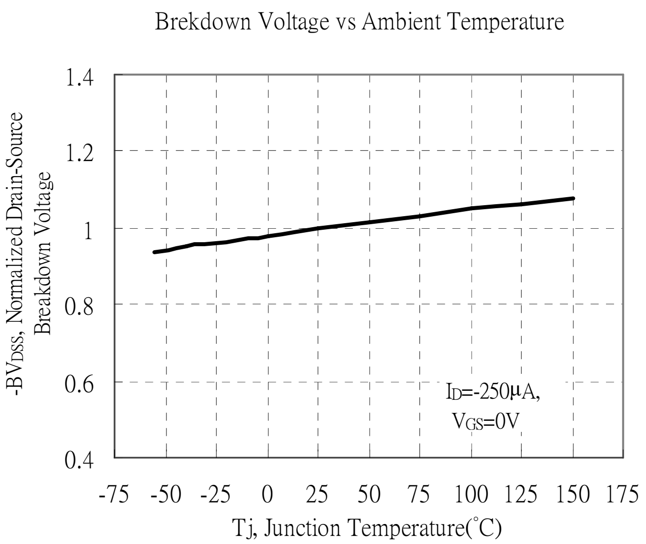
Typical Characteristics(Cont.)



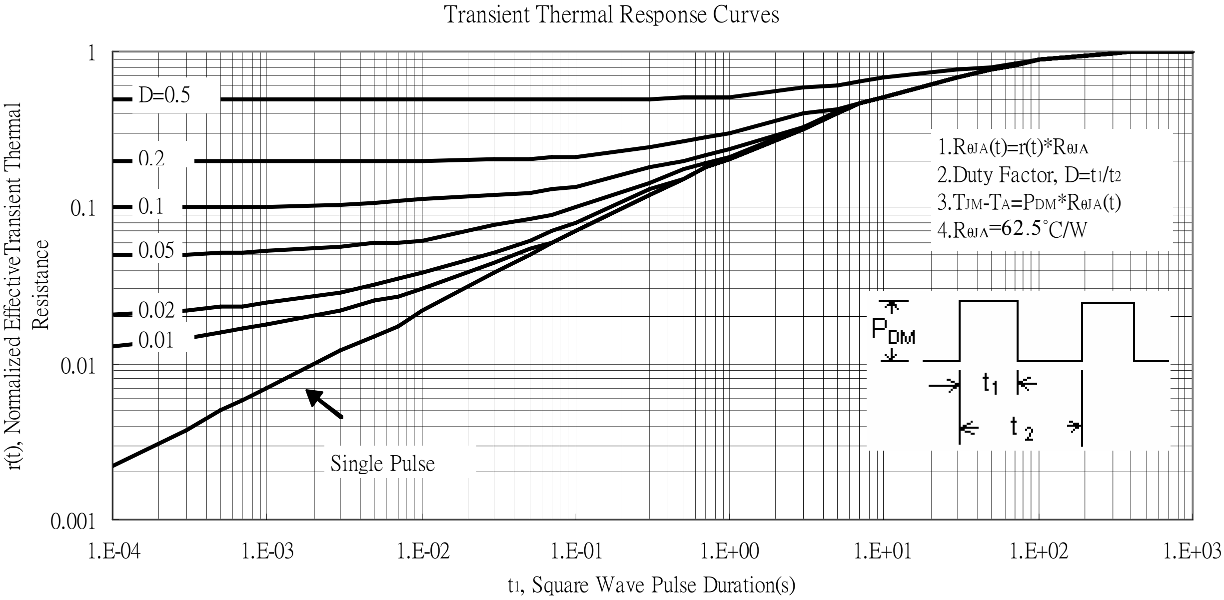




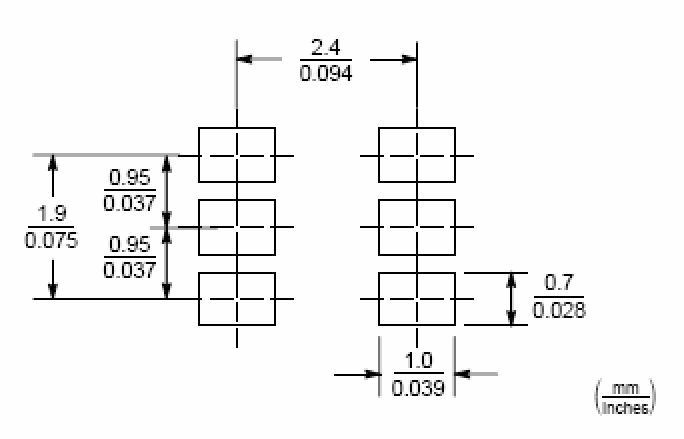




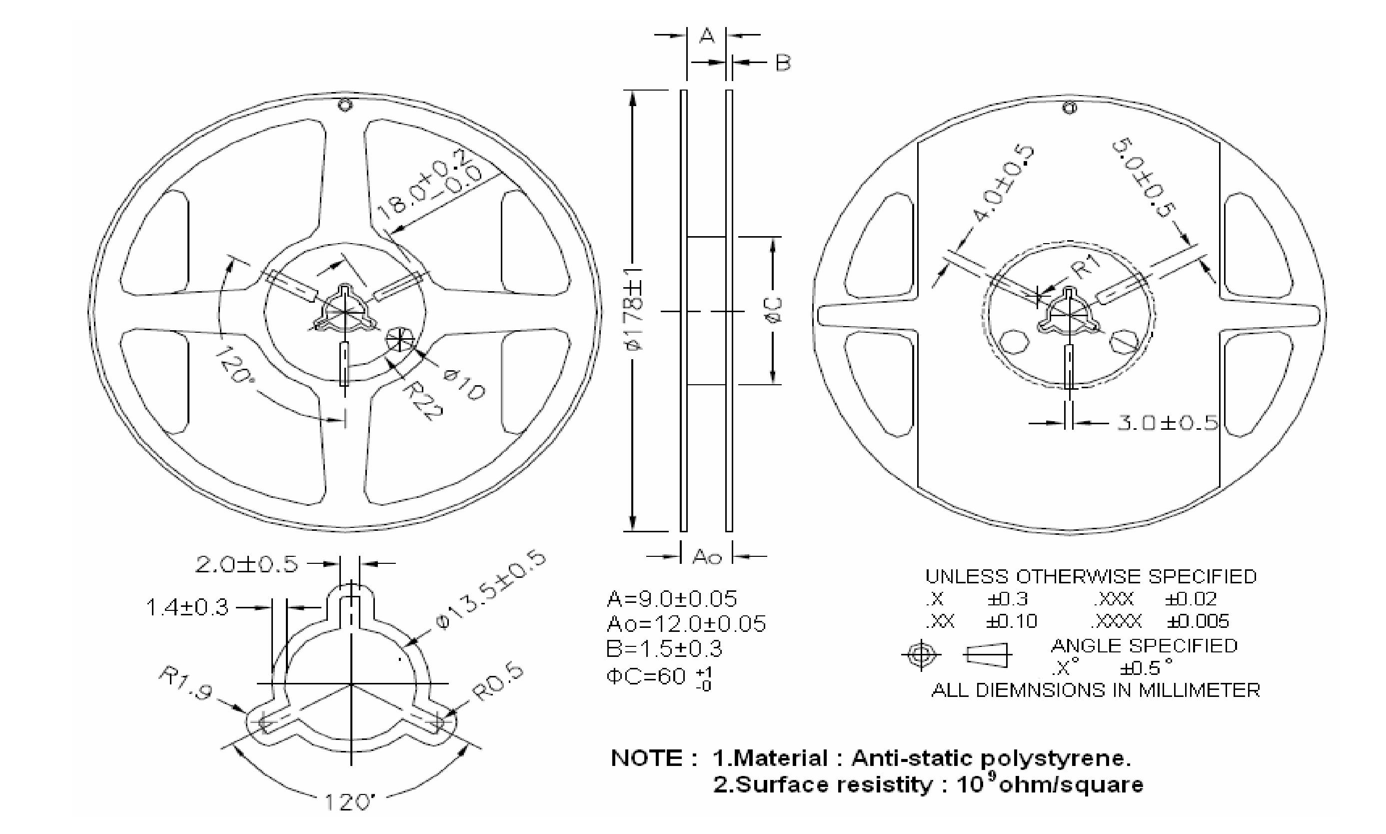
Typical Characteristics(Cont.)



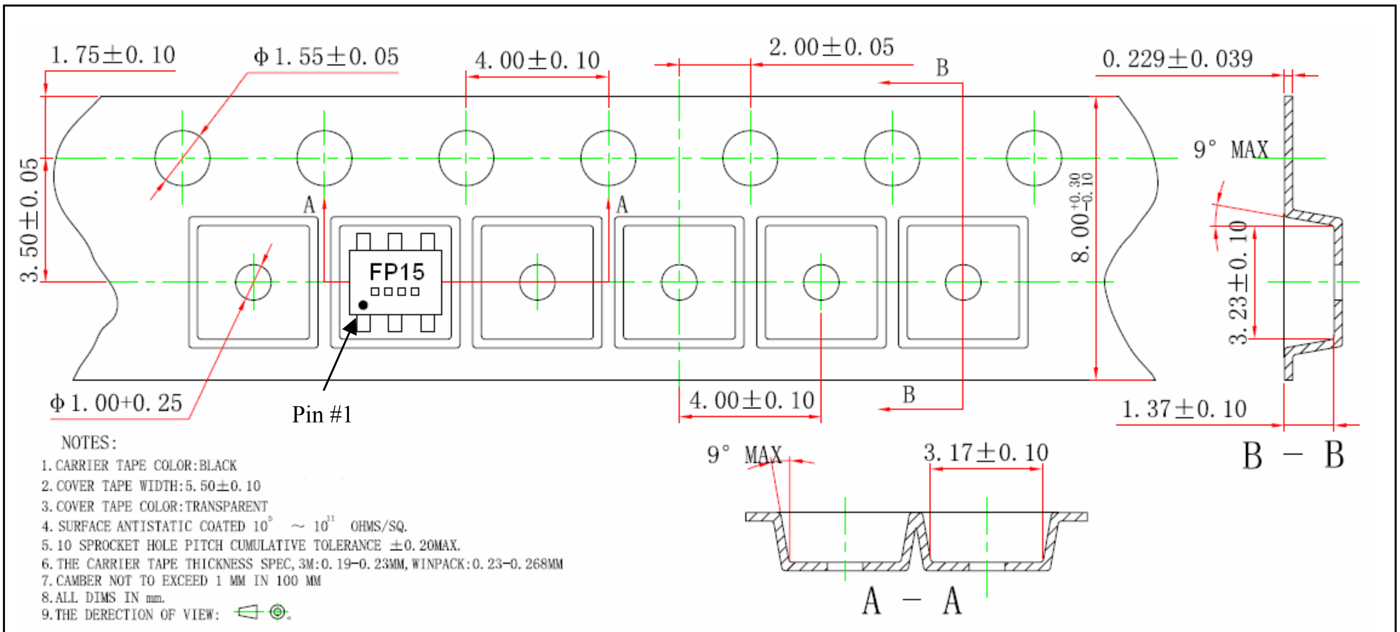
Recommended Soldering Footprint



Reel Dimension



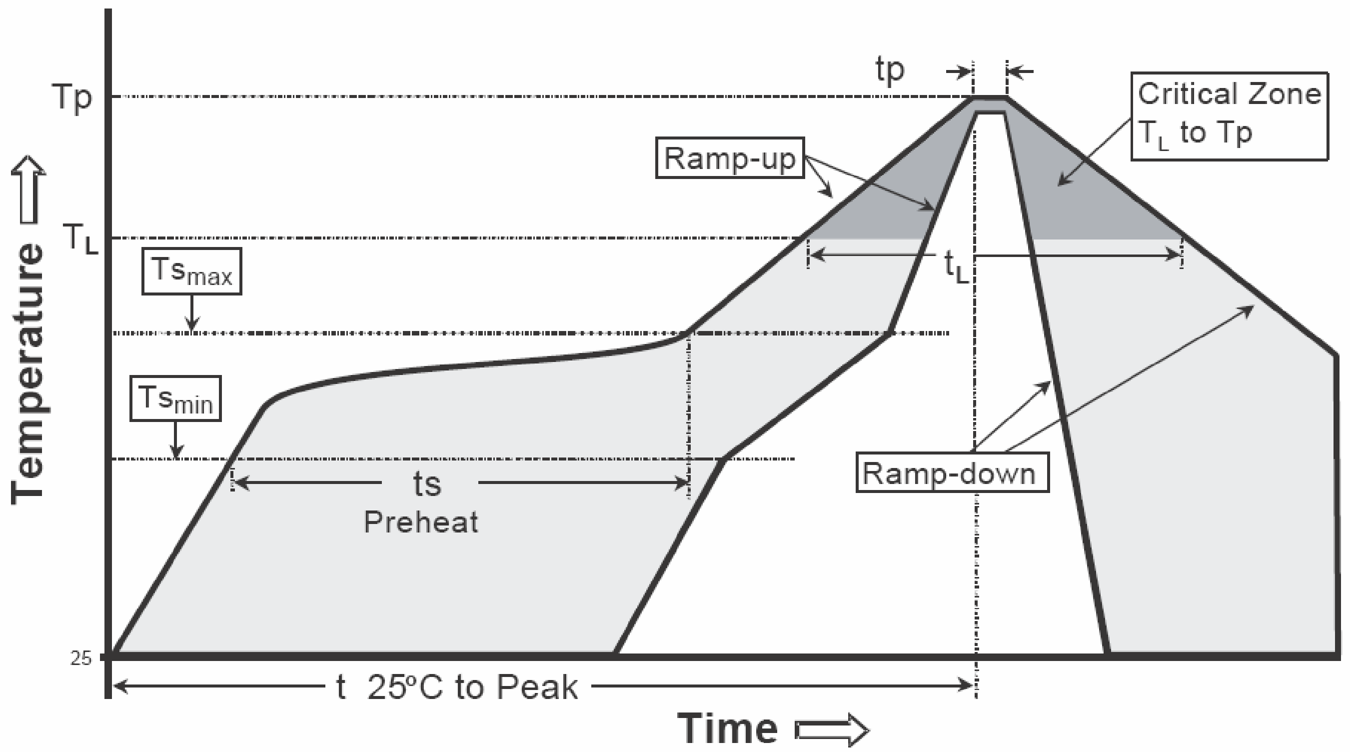
Carrier Tape Dimension



Recommended wave soldering condition

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

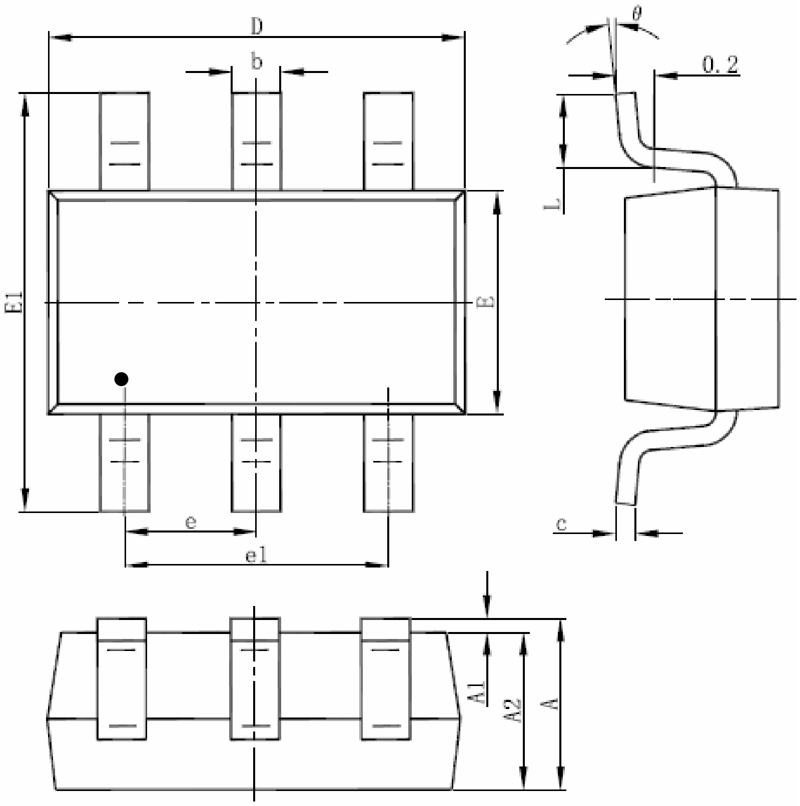
Recommended temperature profile for IR reflow

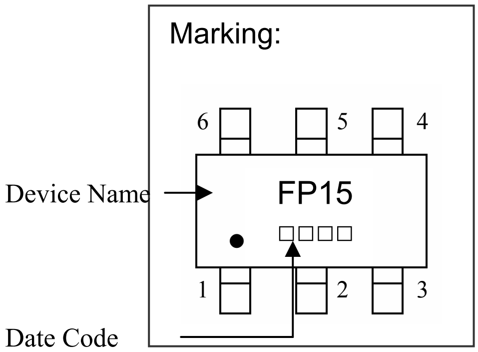


Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat −Temperature Min(Ts min) −Temperature Max(Ts max) −Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: −Temperature (TL) − Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	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.

SOT-26 Dimension





6-Lead SOT-26 Plastic Surface Mounted Package
CYStek Package Code: N6

Style:
Pin 1. Drain (D)
Pin 2. Drain (D)
Pin 3. Gate (G)
Pin 4. Source (S)
Pin 5. Drain (D)
Pin 6. Drain (D)

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	1.050	1.250	0.041	0.049	E	1.500	1.700	0.059	0.067
A1	0.000	0.100	0.000	0.004	E1	2.650	2.950	0.104	0.116
A2	1.050	1.150	0.041	0.045	e	0.950 (BSC)		0.037 (BSC)	
b	0.300	0.500	0.012	0.020	e1	1.800	2.000	0.071	0.079
c	0.100	0.200	0.004	0.008	L	0.300	0.600	0.012	0.024
D	2.820	3.020	0.111	0.119	θ	0°	8°	0°	8°

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.

Important Notice:

-
- CYStek reserves the right to make changes to its products without notice.
- CYStek ***semiconductor products are not warranted to be suitable for use in Life-Support Applications, or systems.***
- CYStek assumes no liability for any consequence of customer product design, infringement of patents, or application assistance.