

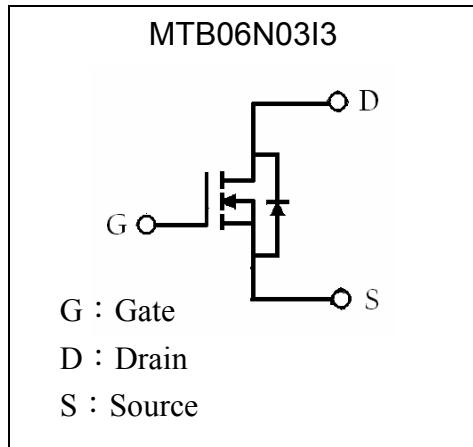
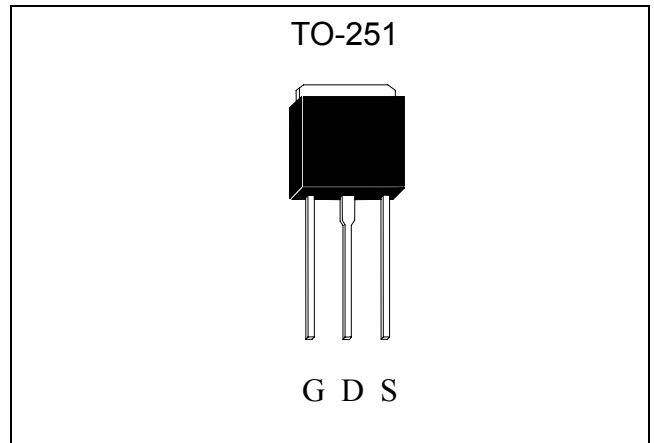
N-Channel Enhancement Mode Power MOSFET

MTB06N03I3

BV_{DSS}	30V
I_D	75A
R_{DS(ON)}@ V_{GS}=10V, I_D=30A	4.5mΩ (typ)
R_{DS(ON)}@ V_{GS}=5V, I_D=24A	7.3mΩ (typ)

Features

- Simple Drive Requirement
- Repetitive Avalanche Rated
- Fast Switching Characteristic
- RoHS compliant package & Halogen-free package

Symbol

Outline

Absolute Maximum Ratings (T_C=25°C, unless otherwise noted)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V _{DS}	30	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current @ T _C =25°C	I _D	75	A
Continuous Drain Current @ T _C =100°C	I _D	47	
Pulsed Drain Current (Note 1)	I _{DM}	200	
Avalanche Current	I _{AS}	53	
Avalanche Energy @ L=0.1mH, I _D =53A, R _G =25Ω	E _{AS}	140	mJ
Repetitive Avalanche Energy @ L=0.05mH (Note 2)	E _{AR}	40	
Total Power Dissipation @ T _C =25°C	P _d	50	W
Total Power Dissipation @ T _C =100°C		20	
Operating Junction and Storage Temperature Range	T _j , T _{stg}	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature
 2. Duty cycle ≤ 1%



Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-case, max	$R_{th,j-c}$	2.5	°C/W
Thermal Resistance, Junction-to-ambient, max	$R_{th,j-a}$	110	°C/W

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

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
$V_{GS(th)}$	1	1.5	3	V	$V_{DS} = V_{GS}, I_D=250\mu A$
I_{GSS}	-	-	±100	nA	$V_{GS}=\pm 20, V_{DS}=0V$
I_{DSS}	-	-	1	μA	$V_{DS} = 24V, V_{GS} = 0V$
	-	-	25		$V_{DS} = 20V, V_{GS} = 0V, T_j=125^\circ C$
* $R_{DS(ON)}$	-	4.5	6	$m\Omega$	$V_{GS} = 10V, I_D=30A$
	-	7.3	9.5		$V_{GS} = 5V, I_D=24A$
* G_{FS}	-	28	-	S	$V_{DS} = 5V, I_D=24A$
Dynamic					
* $Q_g(V_{GS}=10V)$	-	53	-	nC	$I_D=30A, V_{DS}=15V, V_{GS}=10V$
* $Q_g(V_{GS}=5V)$	-	26	-		
* Q_{gs}	-	7	-		
* Q_{gd}	-	12	-		
* $t_{d(ON)}$	-	26	-	ns	$V_{DS}=15V, I_D=25A, V_{GS}=10V, R_{GS}=2.7\Omega$
* t_r	-	12	-		
* $t_{d(OFF)}$	-	54	-		
* t_f	-	18	-		
C_{iss}	-	2811	-	pF	$V_{GS}=0V, V_{DS}=15V, f=1MHz$
C_{oss}	-	316	-		
C_{rss}	-	276	-		
R_g	-	1.2	-	Ω	$V_{GS}=15mV, V_{DS}=0V, f=1MHz$
Source-Drain Diode					
* I_S	-	-	40	A	
* I_{SM}	-	-	160		
* V_{SD}	-	-	1.3	V	$I_F=I_S, V_{GS}=0V$
* t_{rr}	-	30	-	ns	$I_F=I_S, V_{GS}=0, dI_F/dt=100A/\mu s$
* Q_{rr}	-	10	-	nC	

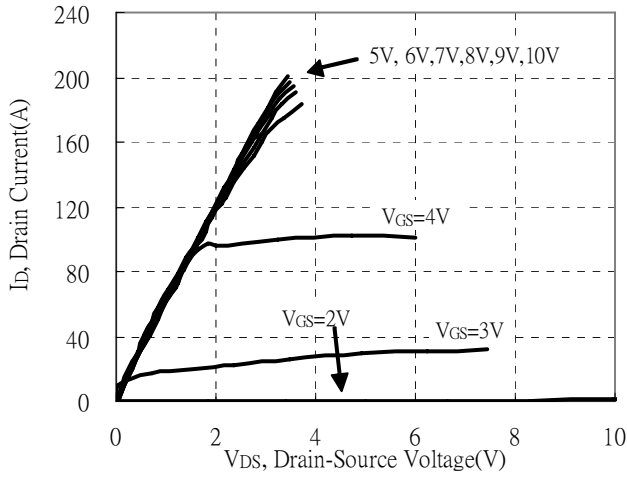
*Pulse Test : Pulse Width ≤300μs, Duty Cycle ≤2%

Ordering Information

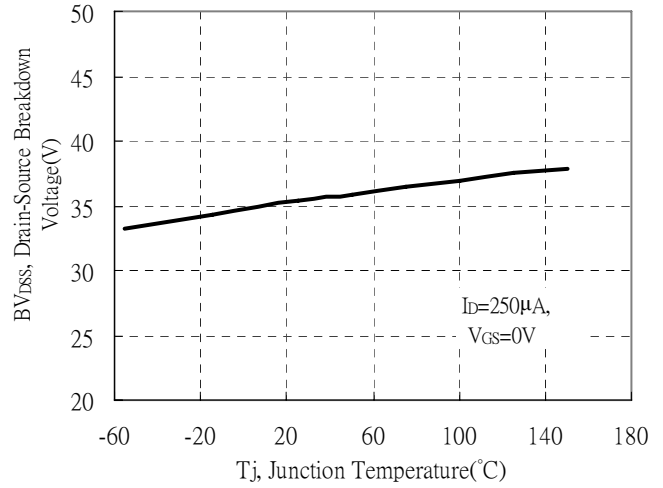
Device	Package	Shipping	Marking
MTB06N03I3	TO-251 (RoHS compliant & Halogen-free)	80 pcs / tube, 50 tubes / box	B06N03

Typical Characteristics

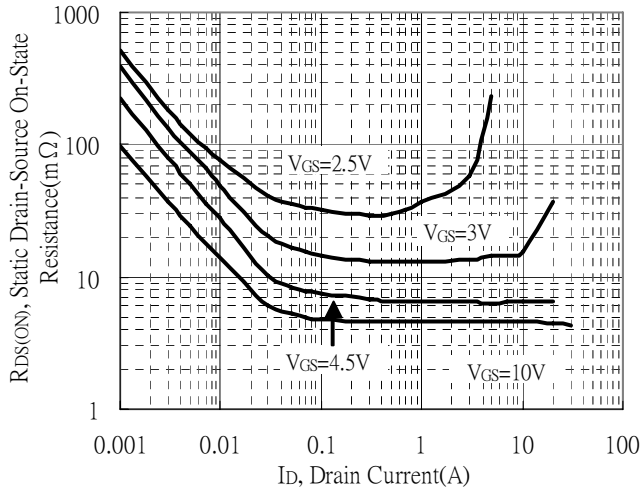
Typical Output Characteristics



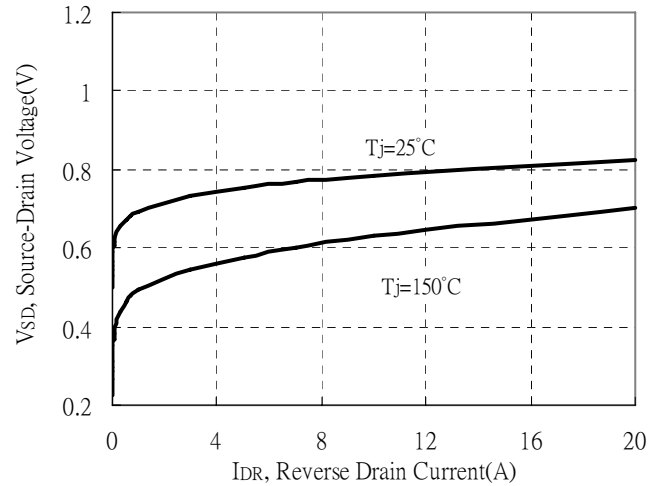
Brekdown Voltage vs Ambient Temperature



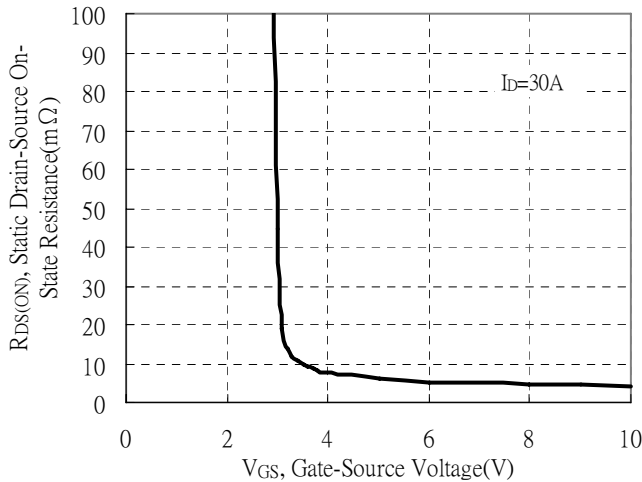
Static Drain-Source On-State resistance vs Drain Current



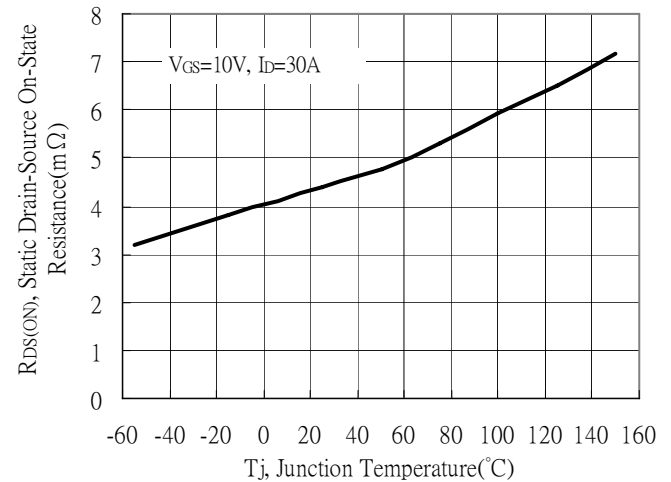
Reverse Drain Current vs Source-Drain Voltage



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

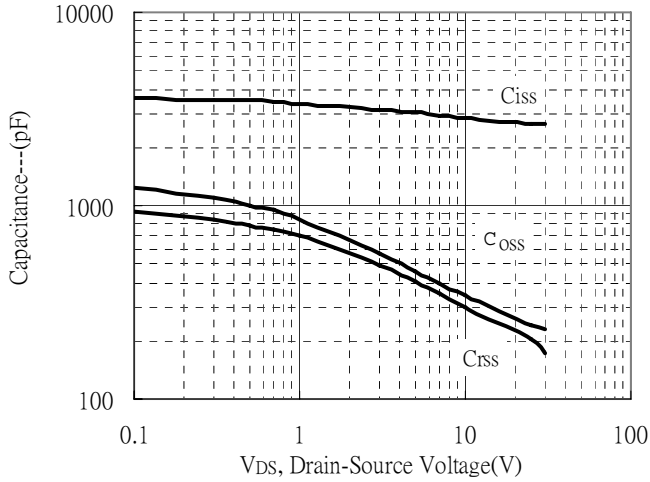


Drain-Source On-State Resistance vs Junction Temperature

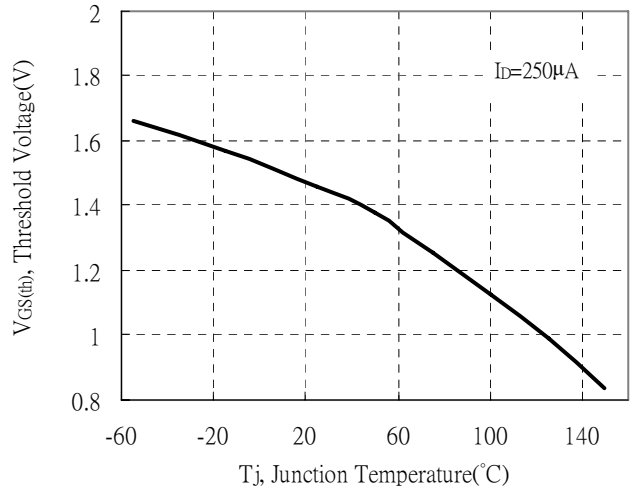


Typical Characteristics(Cont.)

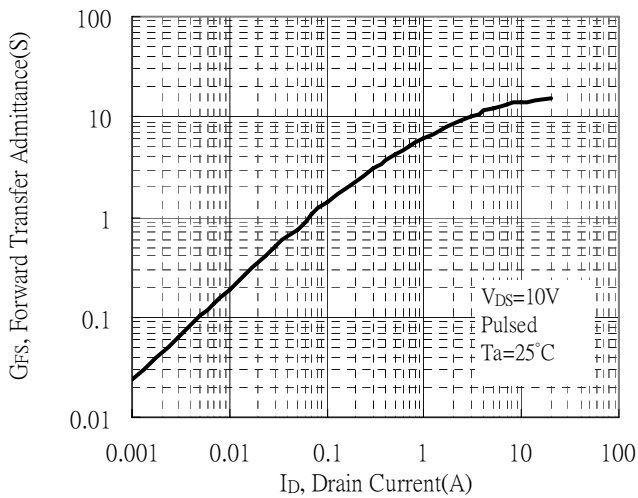
Capacitance vs Drain-to-Source Voltage



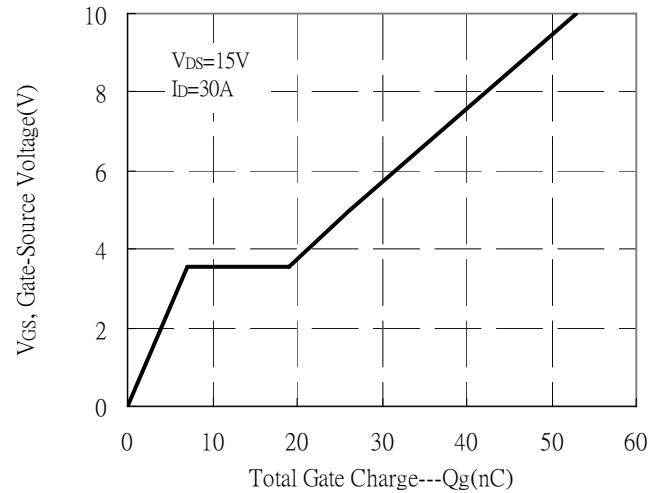
Threshold Voltage vs Junction Temperature



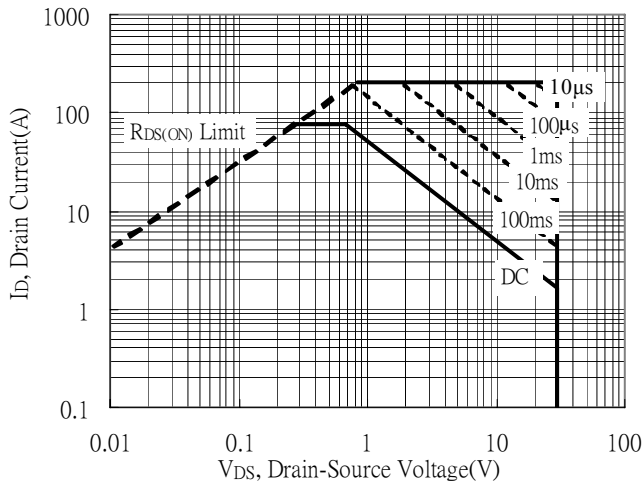
Forward Transfer Admittance vs Drain Current



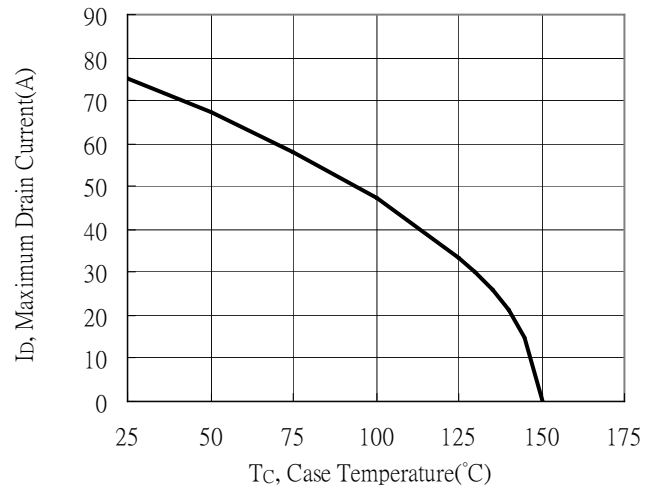
Gate Charge Characteristics



Maximum Safe Operating Area

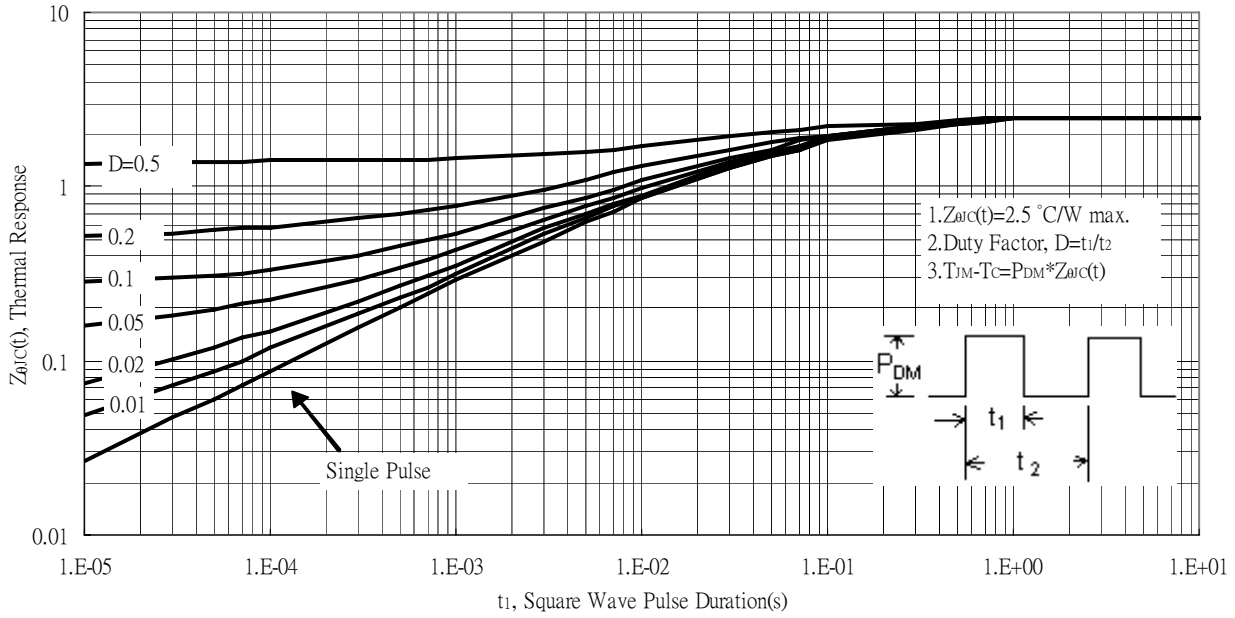


Maximum Drain Current vs Case Temperature



Typical Characteristics(Cont.)

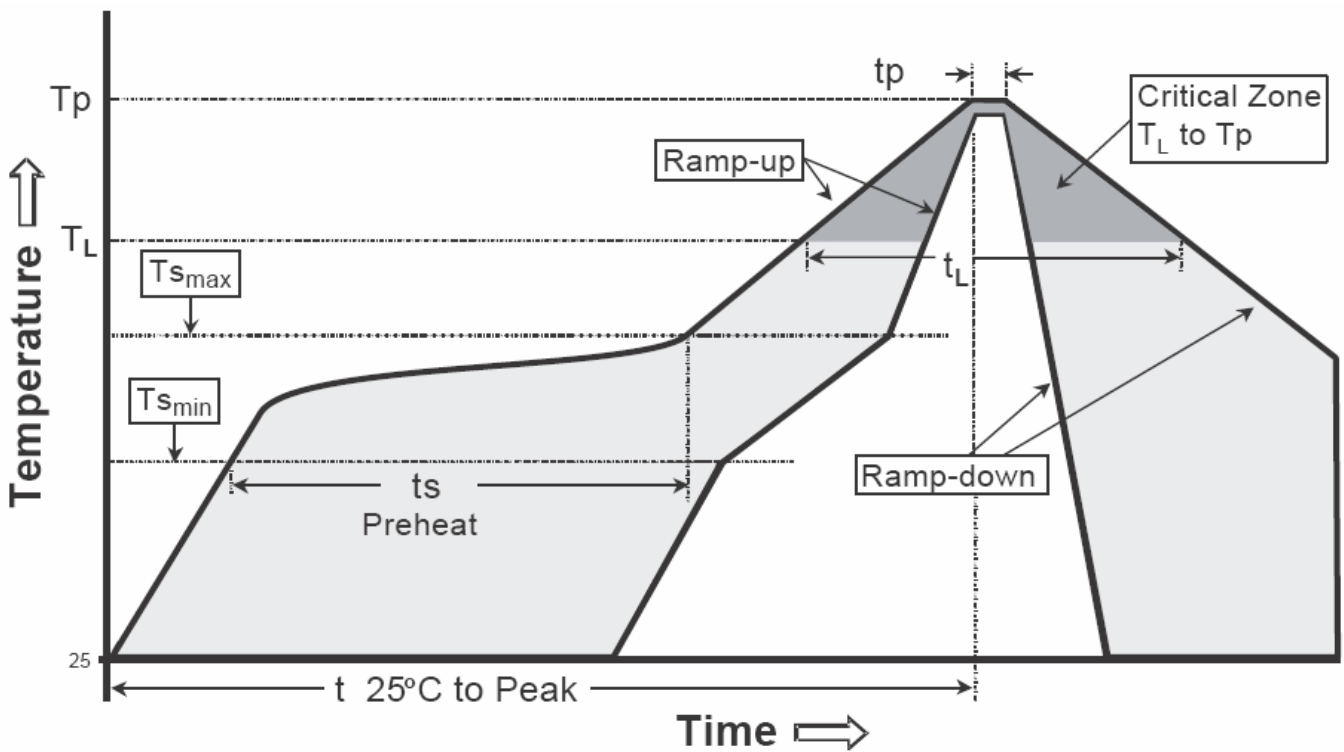
Transient Thermal Response Curves



Recommended wave soldering condition

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

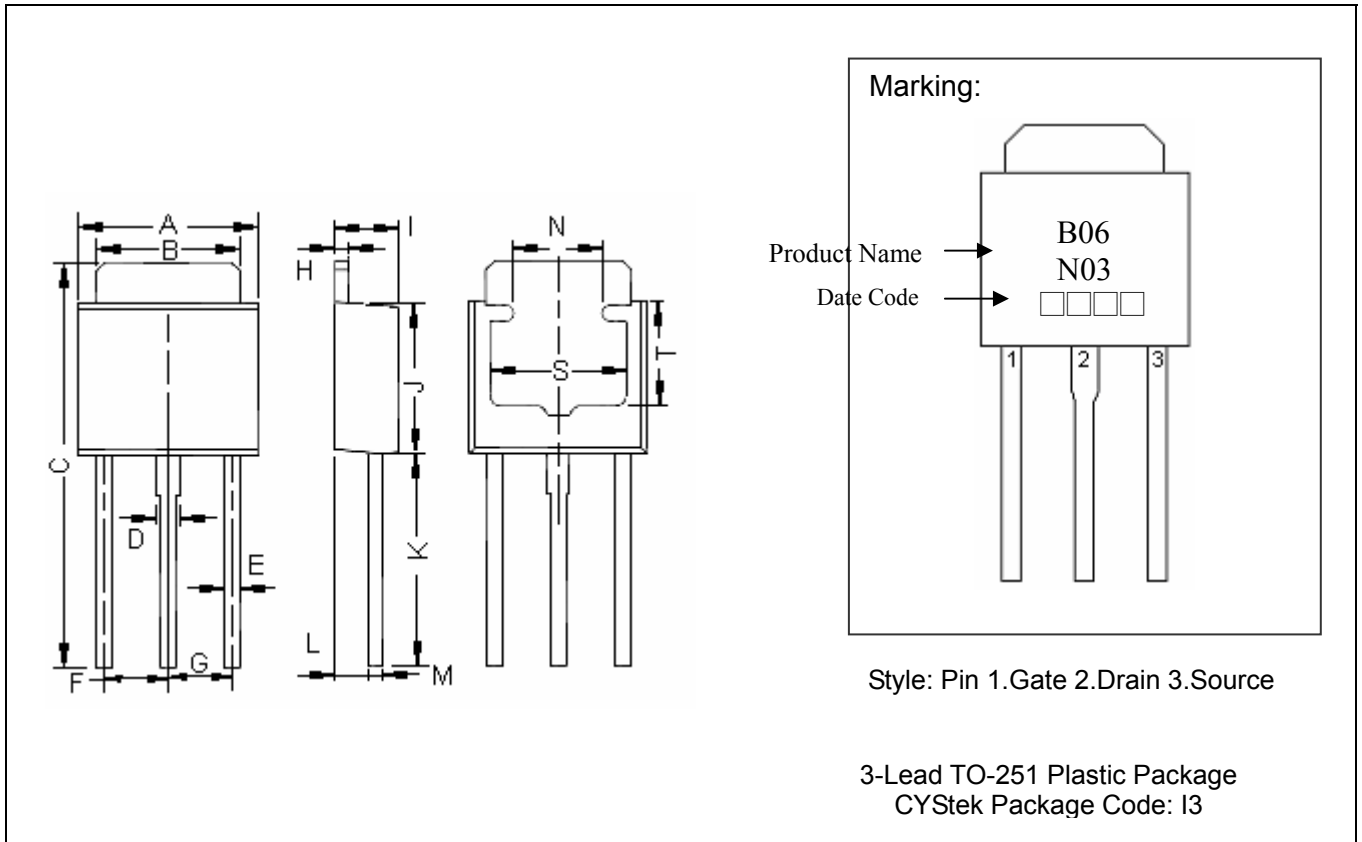
Recommended temperature profile for IR reflow



Profile feature	Sn-Pb eutectic Assembly	Pb-free Assembly
Average ramp-up rate (T _{smax} to T _p)	3°C/second max.	3°C/second max.
Preheat		
-Temperature Min(T _{s min})	100°C	150°C
-Temperature Max(T _{s max})	150°C	200°C
-Time(t _{s min} to t _{s max})	60-120 seconds	60-180 seconds
Time maintained above:		
-Temperature (T _L)	183°C	217°C
- Time (t _L)	60-150 seconds	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.

TO-251 Dimension



Marking:

Product Name → B06
 Date Code → N03

Style: Pin 1.Gate 2.Drain 3.Source

3-Lead TO-251 Plastic Package
 CYStek Package Code: I3

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.250	0.262	6.350	6.650	I	0.087	0.094	2.200	2.400
B	0.205	0.213	5.200	5.400	J	0.213	0.224	5.400	5.700
C	0.571	0.587	14.500	14.900	K	0.295	0.311	7.500	7.900
D	0.028	0.035	0.700	0.900	L	0.042	0.054	1.050	1.350
E	0.020	0.028	0.500	0.700	M	0.017	0.023	0.430	0.580
F	0.091 TYP		2.300 TYP		N	0.118 REF		3.000 REF	
G	0.091 TYP		2.300 TYP		S	0.197 REF		5.000 REF	
H	0.017	0.023	0.430	0.580	T	0.150 REF		3.800 REF	

- 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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