

N TO-252

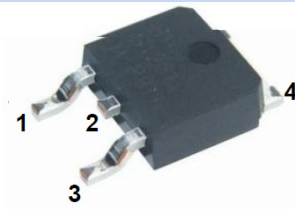
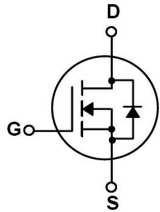
N-CHANNEL MOSFET in a TO-252 Plastic Package.

 $R_{DS(on)}$
 C_{rss}

 Low $R_{DS(on)}$, low gate charge, low C_{rss} , fast switching.

DC/DC

Suited for low voltage applications such as automotive, DC/DC Converters, and high efficiency switching for power management in portable and battery operated products.



PIN1 G

PIN 2 D

PIN 3 S

PIN 4 D

See Marking Instructions.

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DSS}	20	V
Drain Current ^G	$I_D(T_C=25^\circ\text{C})$	30	A
	$I_D(T_C=100^\circ\text{C})$	20	A
Drain Current - Pulsed ^C	I_{DM}	120	A
Maximum Body-Diode Continuous Current ^G	I_S	30	A
Gate-Source Voltage	V_{GS}	± 12	V
Avalanche Current ^C	I_{AS}	12	A
Avalanche energy $L=0.5\text{mH}$ ^C	E_{AS}	115	mJ
Power Dissipation ^B	$P_D(T_C=25^\circ\text{C})$	100	W
	$P_D(T_C=100^\circ\text{C})$	50	W
Power Dissipation ^A	$P_{DSM}(T_A=25^\circ\text{C})$	2.5	W
	$P_{DSM}(T_A=70^\circ\text{C})$	1.6	W
Junction and Storage Temperature Range	$T_J \quad T_{stg}$	-55 150	$^\circ\text{C}$

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V \quad I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V \quad V_{GS}=0V$			1.0	μA
		$T_J=55^\circ\text{C}$			5.0	μA
Gate-Body Leakage Current Forward	I_{GSS}	$V_{GS}=\pm 12V \quad V_{DS}=0V$			± 0.1	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS} \quad I_D=250\mu A$	0.4	1.0	1.2	V
Static Drain-Source On-Resistance	$R_{DS(on)1}$	$V_{GS}=10V \quad I_D=30A$		10	13	m Ω
	$R_{DS(on)2}$	$V_{GS}=4.5V \quad I_D=15A$		11	14	m Ω
Diode Forward Voltage	V_{SD}	$I_S=30A \quad V_{GS}=0V$		0.9	1.35	V

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0MHz$		884		pF
Output Capacitance	C_{oss}			174		
Reverse Transfer Capacitance	C_{rss}			78		
Gate resistance	R_g	$V_{GS}=0V$ $V_{DS}=0V$ $f=1MHz$	0.6	1.4	2.1	Ω
Total Gate Charge	$Q_g(4.5V)$	$V_{GS}=10V$ $V_{DS}=10V$ $I_D=20A$	28	36	43	nC
Gate Source Charge	Q_{gs}			9		
Gate Drain Charge	Q_{gd}			12		
Turn-On Delay Time	$t_{d(on)}$	$V_{GS}=10V$ $V_{DS}=10V$ $R_L=0.5\Omega$ $R_{GEN}=3\Omega$		7		ns
Turn-On Rise Time	t_r			8		
Turn-Off Delay Time	$t_{d(off)}$			70		
Turn-Off Fall Time	t_f			18		
Body Diode Reverse Recovery Time	t_{rr}	$I_F=20A$ $dI/dt=500A/ms$	13	17	20	ns
Body Diode Reverse Recovery Charge	Q_{rr}	$I_F=20A$ $dI/dt=500A/ms$	29	36	43	nC
Maximum Junction-to-Ambient ^A	$R_{\theta JA}$	$t \leq 10s$		16	20	$^{\circ}C/W$
Maximum Junction-to-Ambient ^{AD}		steady-State		41	50	$^{\circ}C/W$
Maximum Junction-to-Case	$R_{\theta JC}$	steady-State		1.2	1.5	$^{\circ}C/W$

A. The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}C$. The Power dissipation PDSM is based on $R_{\theta JA}$ and the maximum allowed junction temperature of $150^{\circ}C$. The value in any given application depends on the user's specific board design, and the maximum temperature of $150^{\circ}C$ may be used if the PCB allows it.

B. The power dissipation PD is based on $T_{J(MAX)}=150^{\circ}C$, using junction-to-case thermal resistance, and is more useful in setting the upper dissipation limit for cases where additional heatsinking is used.

C. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^{\circ}C$. Ratings are based on low frequency and duty cycles to keep initial $T_J=25^{\circ}C$.

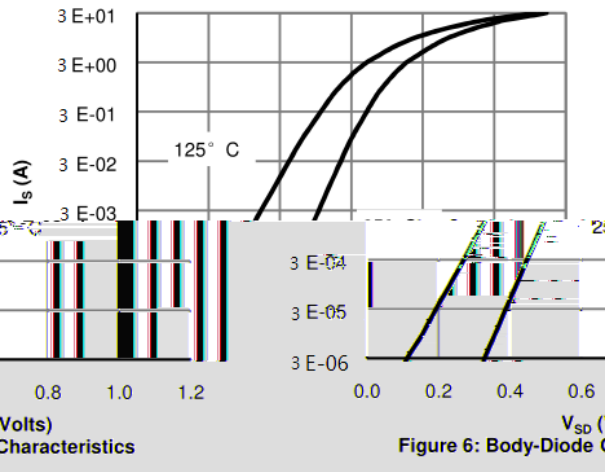
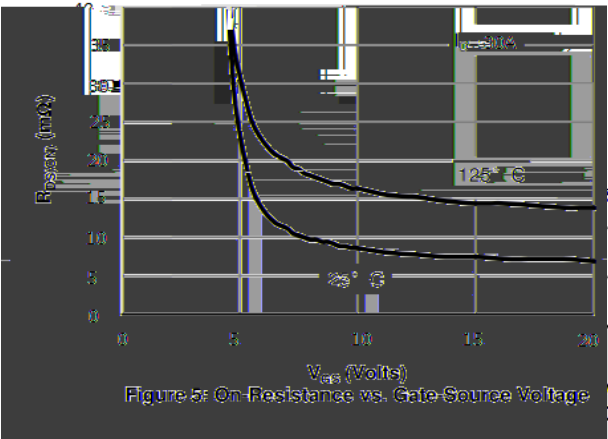
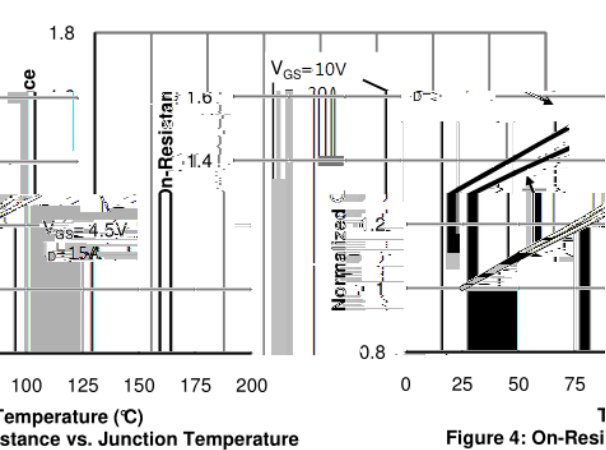
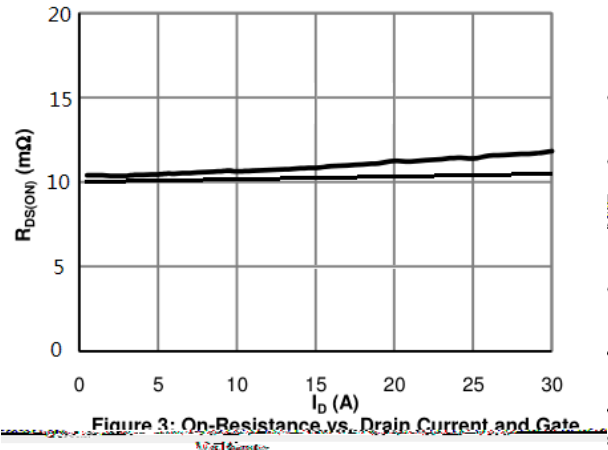
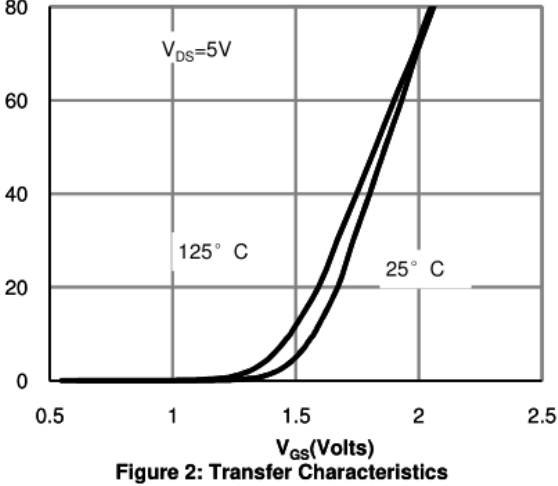
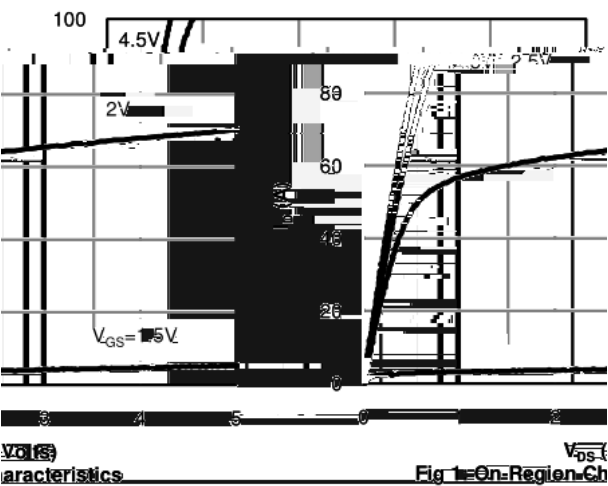
D. The $R_{\theta JA}$ is the sum of the thermal impedance from junction to case $R_{\theta JC}$ and case to ambient.

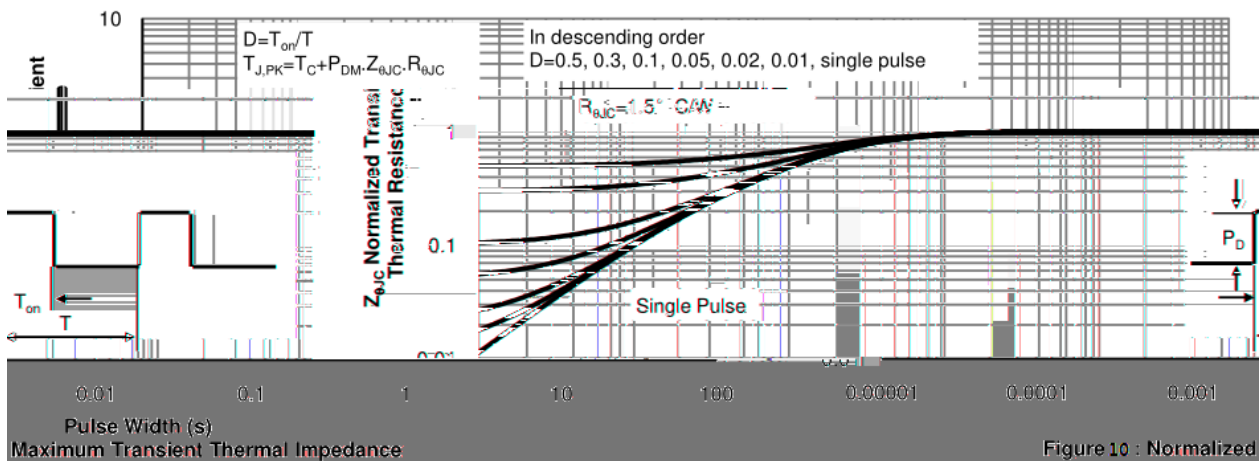
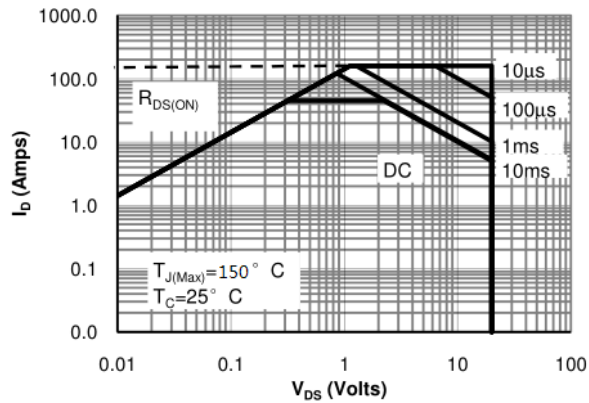
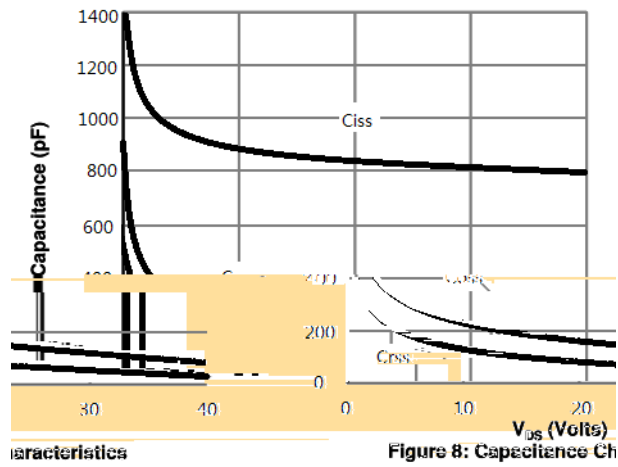
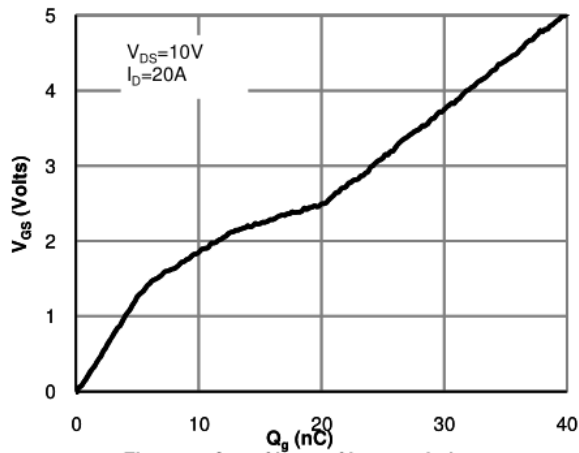
E. The static characteristics in Figures 1to6 are obtained using <300ms pulses, duty cycle 0.5% max.

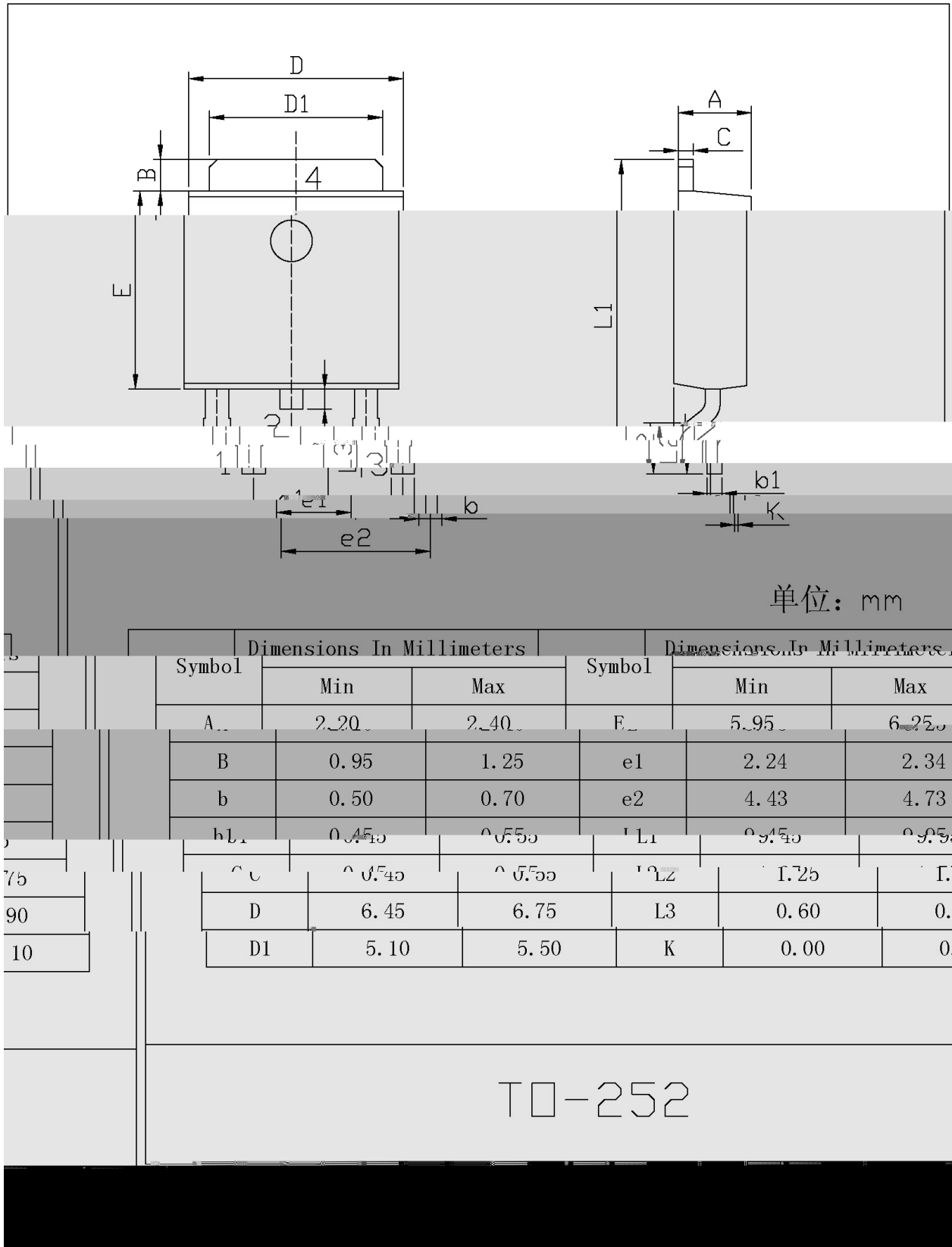
F. These curves are based on the junction-to-case thermal impedance which is measured with the device mounted to a large heatsink, assuming a maximum junction temperature of $T_{J(MAX)}=150^{\circ}C$. The SOA curve provides a single pulse rating.

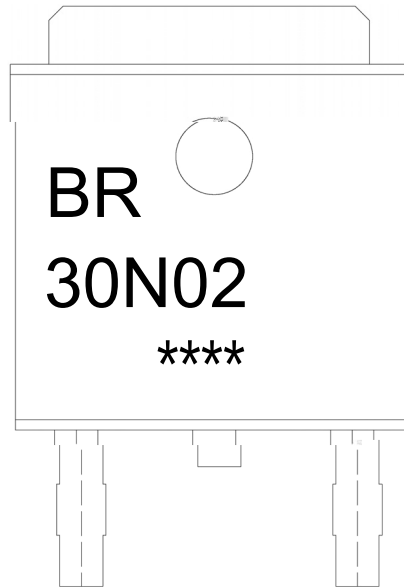
G. The maximum current rating is package limited.

H. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with $T_A=25^{\circ}C$.









BR

30N02

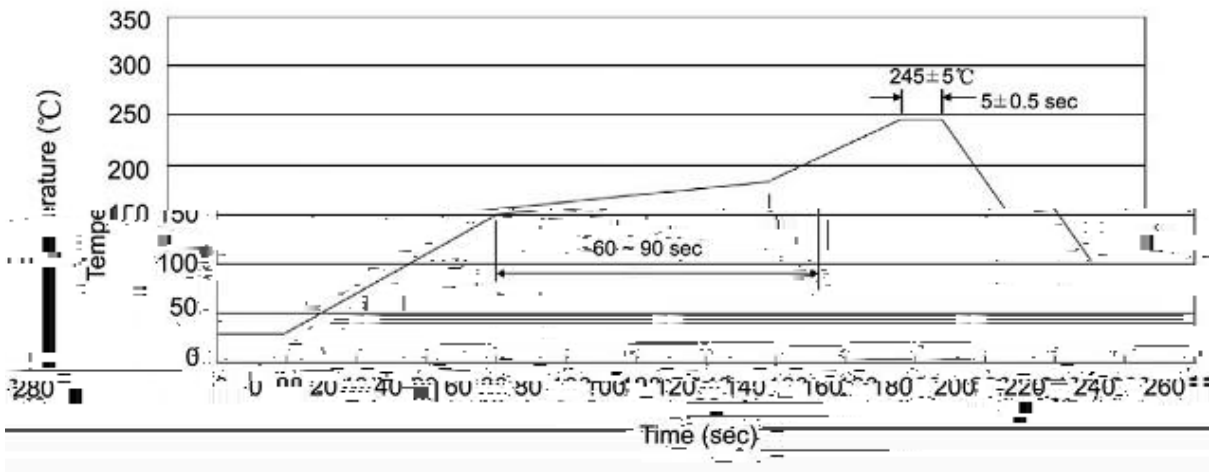
Note:

BR: Company Code

30N02: Product Type Code.

****: Lot No. Code, code change with Lot No.

Temperature Profile for IR Reflow Soldering(Pb-Free)



Note:

- 1

150 180

60 90sec;

1.Preheating:150~180 , Time:60~90sec.
- 2

245±5

5±0.5sec;

2.Peak Temp.:245±5 , Duration:5±0.5sec.
- 3

2 10

/sec.

3. Cooling Speed: 2~10 /sec.

260±5

10±1 sec.

Temp.:260±5℃

Time:10±1 sec

/ REEL

Package Type	Units					Dimension (unit mm ³)		
	Units/Reel	Reels/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Reel	Inner Box	Outer Box
TO-252	2,500	2	5,000	5	25,000	13 ×16	360×360×50	385×257×392

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-251/252	75	48	3,600	5	18,000	526×20.5×5.25	555×164×50	575×290×180