

/ Descriptions

TO-247

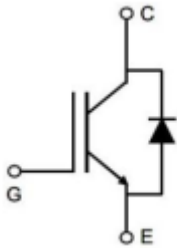
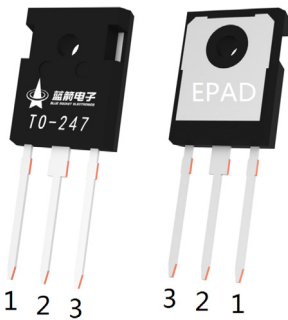
Insulated-Gate Bipolar Transistor in a TO-247 Plastic Package.

/ Features

650V 75A

 $V_{CE(SAT)} = 1.80V(\text{typ.}) @ V_{GE} = 15V, I_C = 75A$ **/ Applications**

Solar Converters, Uninterrupted Power Supply, Welding Converters, Mid to High Range Switching Frequency Converters.

/ Equivalent Circuit**/ Pinning**

PIN1 G PIN 2 EPAD C PIN 3 E

/ Marking

See Marking Instructions.

/ Absolute Maximum Ratings($T_a=25$)

Parameter		Symbol	Rating	Unit
Collector-Emitter Voltage		V_{CES}	650	V
Gate-Emitter Voltage		V_{GES}	± 30	V
Continuous Collector Current	$T_C=25$	I_C	110	A
	$T_C=100$		75	A
Pulsed Collector Current , Limited by T_{Jmax}		I_{CM}	300	A
Continuous Diode Forward Current	$T_C=25$	I_F	110	A
	$T_C=100$		75	A
Power Dissipation	$T_C=25$	P_D	385	W
	$T_C=100$		192	W
Operating Junction Temperature Range		T_J	-40 to +175	
Storage Temperature Range		T_{STG}	-55 to +150	
Maximum Junction-to-Ambient		$R_{\theta JA}$	40	/W
Maximum IGBT Junction-to-Case		$R_{\theta JC}$	0.32	/W
Maximum Diode Junction-to-Case		$R_{\theta JC}$	0.67	/W

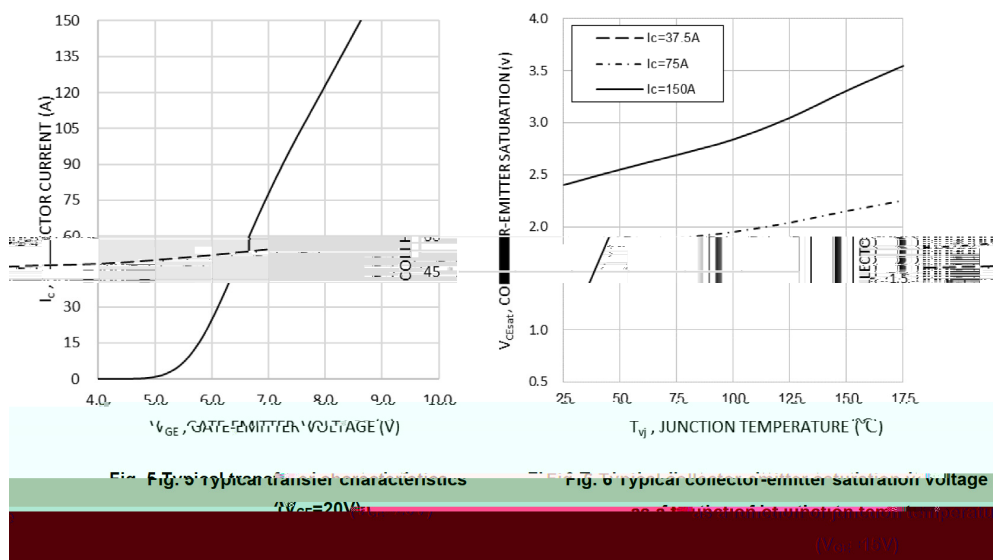
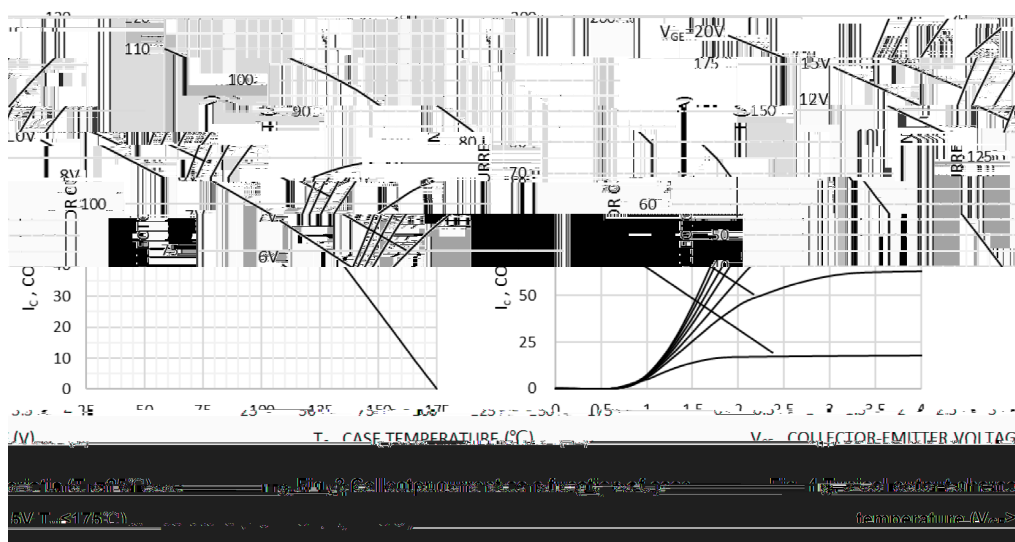
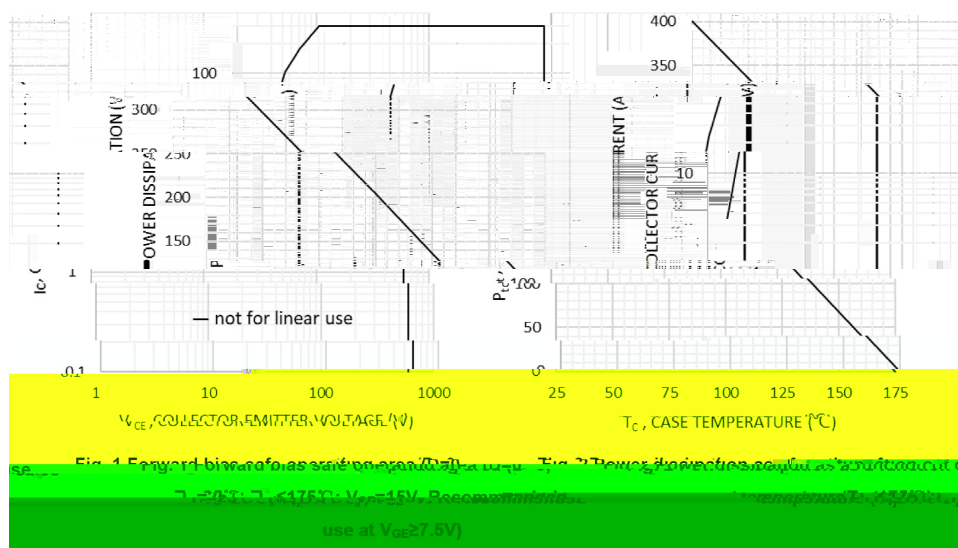
/ Electrical Characteristics($T_c=25$)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Collector-Emitter Breakdown Voltage	BV_{CES}	$I_C=200\mu A$, $V_{GE}=0V$	650			V
Zero Gate Voltage Collector current	I_{CES}	$V_{CE}=650V$, $V_{GE}=0V$			75	μA
Gate-Emitter Leakage Current	I_{GES}	$V_{CE}=0V$, $V_{GE}=\pm 30V$			± 100	nA
Gate-Emitter Threshold Voltage	$V_{GE(th)}$	$V_{CE}=V_{GE}$, $I_C=750\mu A$	3.2	4.0	4.8	V
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	$V_{GE}=15V$, $I_C=75A$, $T_J=25$		1.80	2.20	V
		$T_J=125$		2.05		
Total Gate Charge	Q_g	$V_{GE}=15V$, $V_{CC}=520V$, $I_C=75A$		118		nC
Gate to Emitter Charge	Q_{ge}			32		
Gate to Collector Charge	Q_{gc}			30		

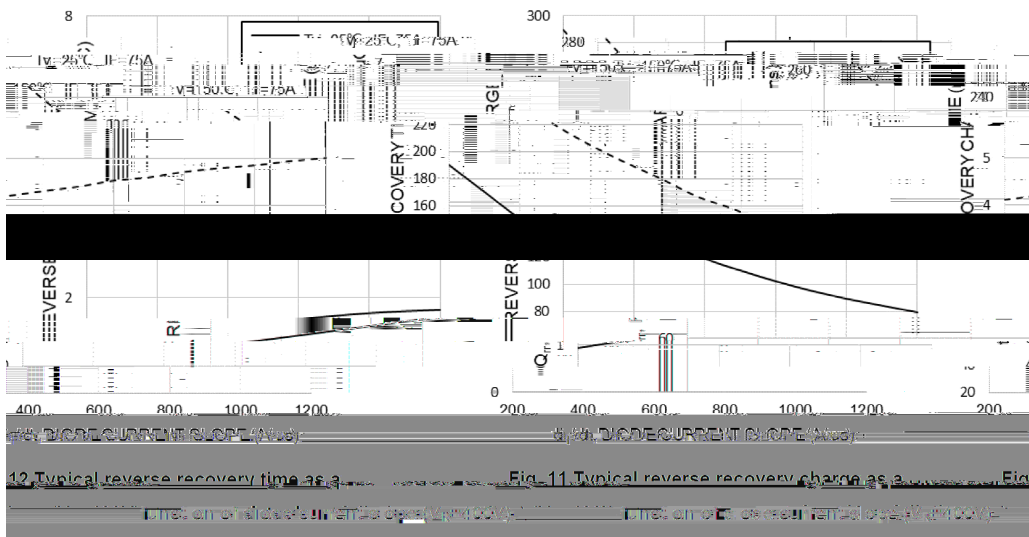
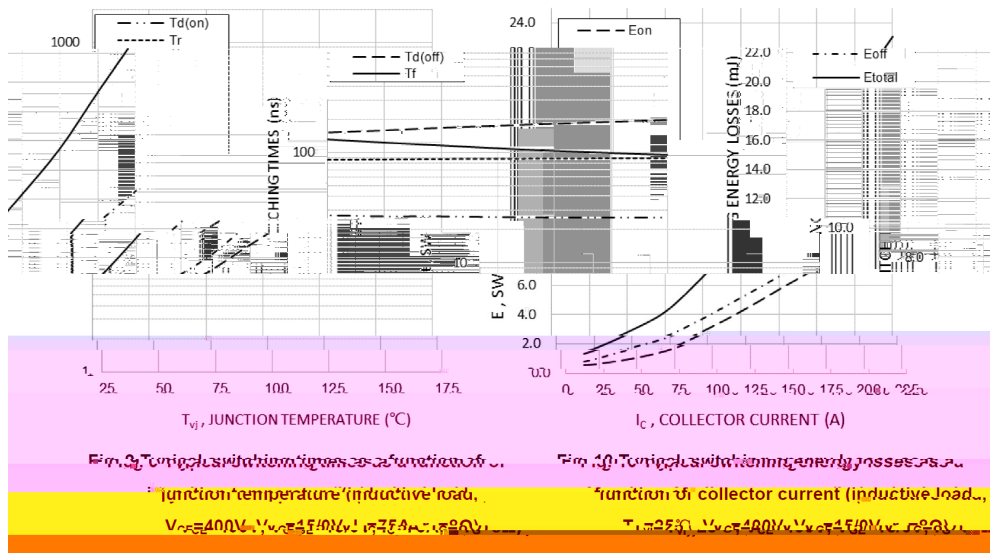
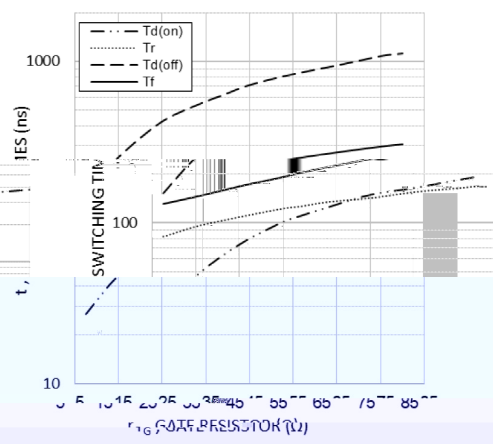
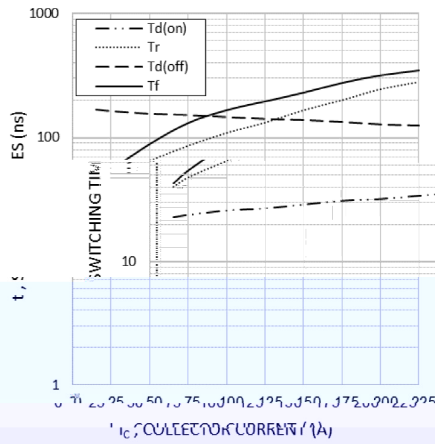
/ Electrical Characteristics(Ta=25)

Parameter	Symbol	Test Conditions		Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{GE}=15V$, $V_{CC}=400V$ $I_C=75A$, $R_G=8\Omega$ Inductive Load $T_C=25$			32		ns
Turn-On Rise Time	t_r				91		ns
Turn-Off Delay Time	$t_{d(off)}$				152		ns
Turn-Off Fall Time	t_f				129		ns
Turn-On Energy	E_{on}				1.88		mJ
Turn-Off Energy	E_{off}				2.43		mJ
Total Switching Energy	E_{ts}				4.31		mJ
Input Capacitance	C_{ies}	$V_{GE}=0V$, $V_{CE}=25V$ $f=1MHz$			3781		pF
Output Capacitance	C_{oes}				355		pF
Reverse Transfer Capacitance	C_{res}				38		pF
Short Circuit Safe Operation Area	SCSOA	$V_{GE}=15V$, $V_{CC} \leq 400V$, $T_{J,start} \leq 25$		5			μs
Diode Forward Voltage	V_F	$I_F=75A$	$T_J=25$		1.80	2.2	V
			$T_J=150$		1.65		
Diode Reverse Recovery Time	T_{rr}	$V_R=400V$, $I_F=75A$ $dI_F/dt=500A/\mu s$ $T_C=25$			136		ns
Diode Reverse Recovery Charge	Q_{rr}				1.2		μC
Diode Peak Reverse Recovery Current	I_{rm}				14		A

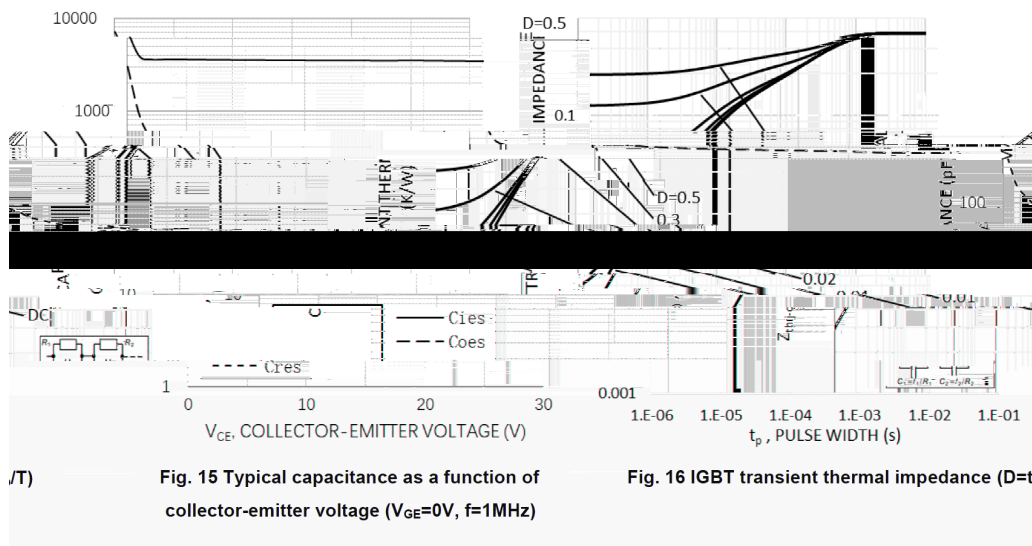
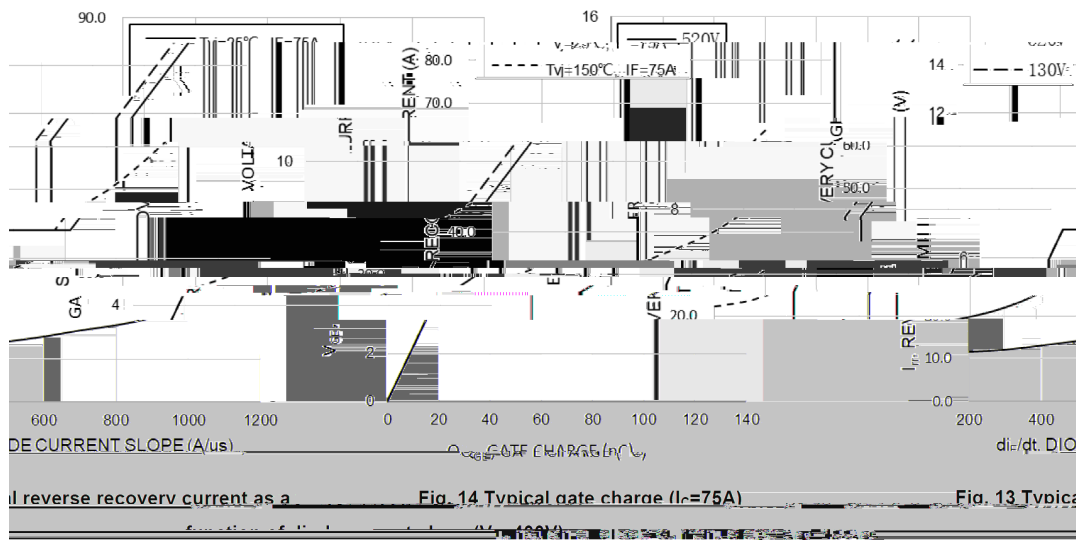
/ Electrical Characteristic Curve



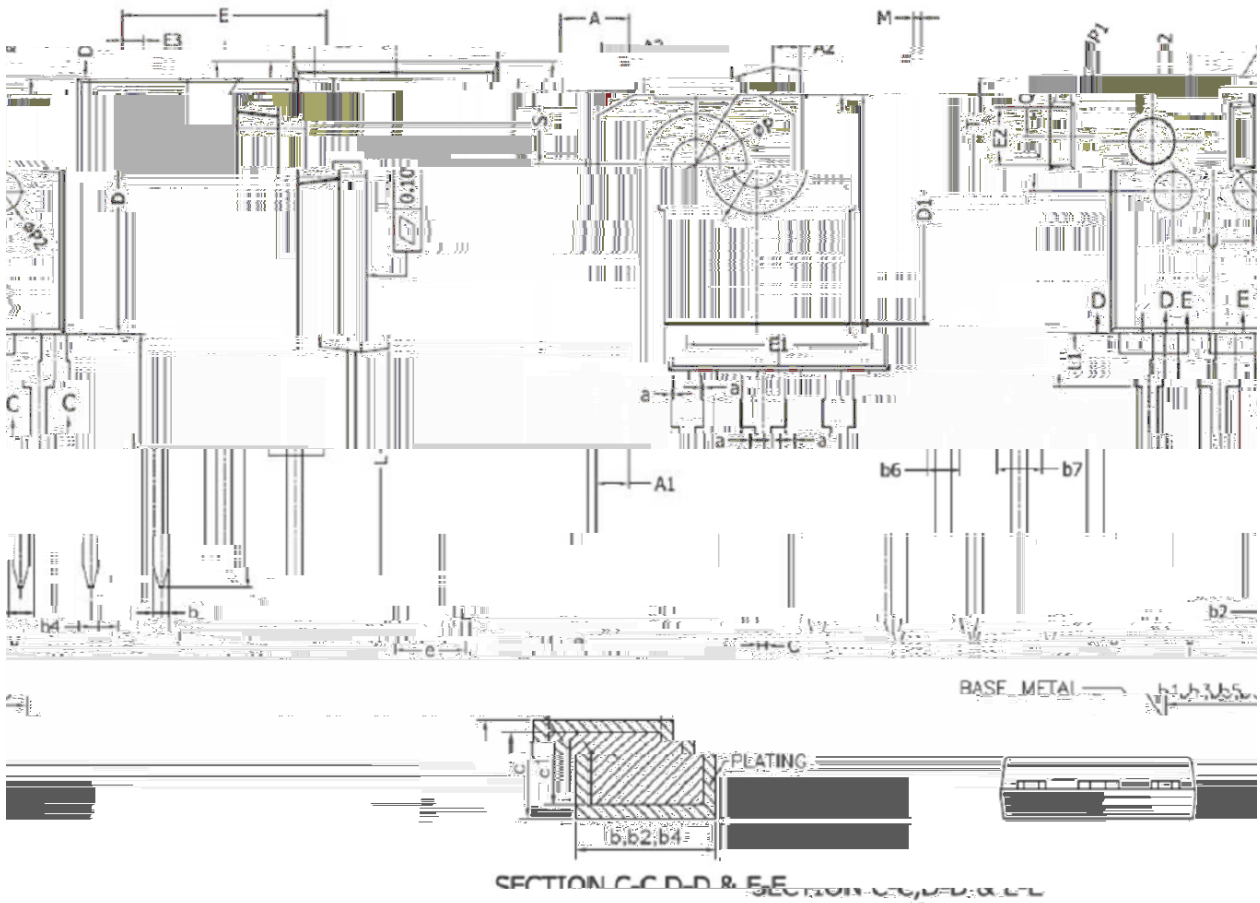
Electrical Characteristic Curve



/ Electrical Characteristic Curve



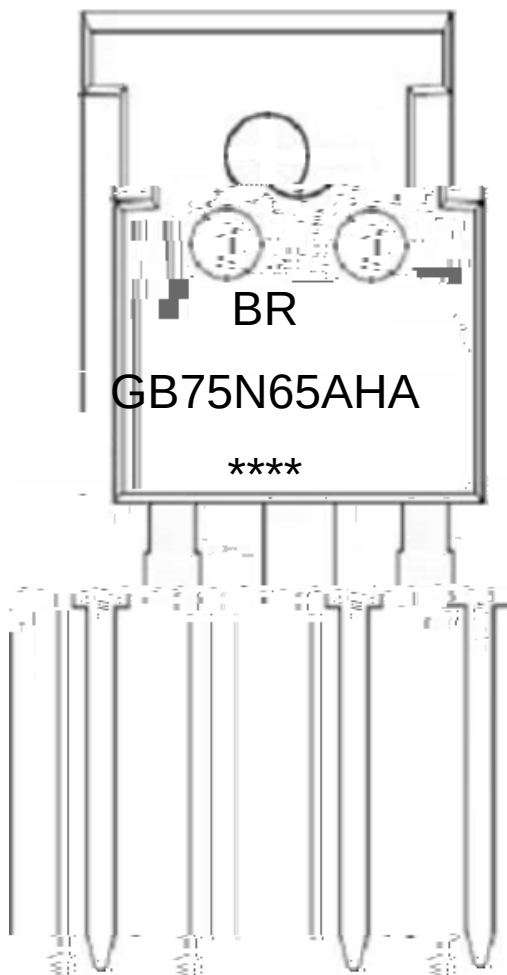
/ Package Dimensions



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	MIN.	NOM.	MAX.		MIN.	NOM.	MAX.
A	4.90	5.00	5.10	E	15.70	15.80	15.90
A1	2.31	2.41	2.51	E1	13.10	13.30	13.50
A2	1.90	2.00	2.10	E2	4.40	4.50	4.60
a	0.00	-	0.15	E3	1.50	1.60	1.70
a'	0.00	-	0.15	e	5.436 BSC		
b	1.16	-	1.26	L	19.80	19.92	20.10
b1	1.15	1.20	1.22	L1	-	-	4.30
b2	1.96	-	2.06	M	0.35	-	0.95
b3	1.95	2.00	2.02	P	3.40	3.50	3.60
b4	2.96	-	3.06	P1	7.00	-	7.40
b5	2.96	3.00	3.02	P2	2.40	2.50	2.60
b6	-	-	2.25	Q	5.60	-	6.00
b7	-	-	3.25	S	6.05	6.15	6.25
c	0.59	-	0.66	T	9.80	-	10.20
c1	0.58	0.60	0.62	U	6.00	-	6.40
D	20.90	21.00	21.10				
D1	16.25	16.55	16.85				
D2	1.05	1.17	1.35				



/ Marking Instructions



BR

GB75N65AHA

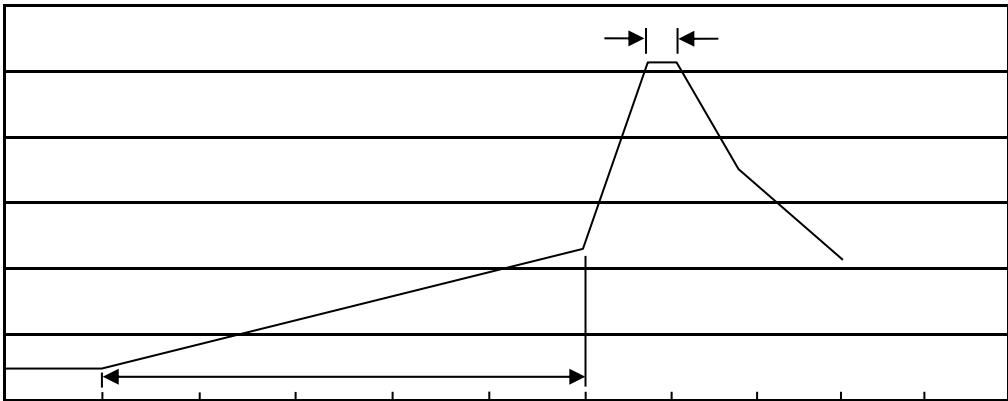
Note:

BR: Company Code

GB75N65AHA: Product Type Code

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

() / Temperature Profile for Dip Soldering(Pb-Free)



- 1

25 150

60 90sec;
- 2

255±5

5±0.5sec;
- 3

2 10

/sec.
- Note:
1.Preheating:25~150 , Time:60~90sec.
2.Peak Temp.:255±5 , Duration:5±0.5sec.
3. Cooling Speed: 2~10 /sec.

/ Resistance to Soldering Heat Test Conditions

270±5 10±1 sec. Temp.:270±5℃ Time:10±1 sec

/ Packaging SPEC.

/ TUBE

Package Type	Units					Dimension		(unit mm ³)

/ Notices

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