

# Reliability Test Result

Product Bipolar Transistor	Package	SOT-563(EMT6)
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TEST ITEM	1. TEST RESULT						
		TEST C	TEST CONDITION				
Soldering heat resistance   289±9°C, 10sec, Solder-bath   JES022-A111   22			TEST SOMETHON		(Sample QTY.)	(NG QTY.)	
245±5°C 3sec.   Nand soldering   22		260±5°C , 30sec. , Reflow meth	260±5°C , 30sec. , Reflow method 3times		22	0	
245±5°C 3sec , Reflow method	Soldering heat resistance	260±5°C , 10sec. , Solder−bath	260±5°C , 10sec. , Solder−bath		22	0	
Solderability   245±5°C, 3sec., Solder-bath   JESD22-B102   22   0		350±10℃ , 3sec. , Hand solder	350±10°C , 3sec. , Hand soldering		22	0	
245±5°C, 3esc., Solder-bath  245±5°C, 3esc., Solder-bath  JESD22-B102  22  0  Temperature cycle  -55±5°C → -150±5°C 200cycles  JESD22-A104  22  0  High temp. high humidity reverse bias  85±2°C, 85±596RH, specified bias ,1000hours  JESD22-A101  22  0  Pressure cooker test  121±2°C, 10096RH, 203kPa, 100hours  JESD22-A102  22  0  High temperature reverse bias  Tj max., specified bias , 1000hours  JESD22-A108  22  0  High temperature gate bias  Tj max., specified bias , 1000hours  JESD22-A108  22  0  MIL-STD-750 ON 120x/OFF 120s per cycle Duration: 1000cycles  Power and Temperature Cycle  Ta=-40(+0)-10°C ~+85(+10'-0)°C, ON 300x/OFF 300s per cycle Duration: 6000cycles  JESD22 A-105  JESD22 A-105  Z2  0  According to the electrical characteristics specified by the specification  Cutoff current : IEBO  Per specification  Cutoff current : IEBO  Per specification  Cutoff current zine Per specification  According to the electrical characteristics specified by the specification  Cutoff current zine Per specification  Reflow Soldering Immersed surface, other than the end of pin as cut-surface, must be covered by solder.	Solderskility	245±5°C ,3sec. , Reflow metho	245±5°C ,3sec. , Reflow method		22	0	
High temp. high humidity reverse bias 85±2°C, 85±596RH, specified bias ,1000hours JESD22-A101 22 0  Pressure cooker test 121±2°C , 10096RH , 203kPa , 100hours JESD22-A102 22 0  High temperature reverse bias T <sub>j</sub> max. specified bias , 1000hours JESD22-A108 22 0  High temperature gate bias T <sub>j</sub> max, VSSS(max) , 1000hours JESD22-A108 22 0  Intermittent Operation Life ON 120x/OFF 120s per cycle Duration: 15000cycles Method 1037 ON 120x/OFF 120s per cycle Duration: 15000cycles JESD22 A-105  Lead strength (lead pull) Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec. JEITA ED-4701/400 Test Method 401  Z. MEASUREMENT ITEM & CRITERIA  ITEM CONDITION CRITERIA  ITEM CONDITION CRITERIA  CUtoff current : ICBO Per specification  Cutoff current : ICBO Per specific	Golderability	245±5°C , 3sec. , Solder−bath	245±5°C , 3sec. , Solder−bath		22	0	
Pressure cooker test         121±2°C, 10096RH, 203kPa, 100hours         JESD22-A102         22         0           High temperature reverse bias         Tj max., specified bias, 1000hours         JESD22-A108         22         0           High temperature gate bias         Tj max, VGSS(max), 1000hours         JESD22-A108         22         0           Intermittent Operation Life         Ta=25±5°C, ∠Tij≥ 100°C, ON 120s/OFF 120s per cycle Duration: 15000cycles         MiL-STD-750 Method 1037         MiL-STD-750 Method 1037           Power and Temperature Cycle         Ta=40(+0/-10°C, ON 300s/OFF 300s per cycle Duration: 6000cycles         JESD22 A-105         22         0           Lead strength (lead pull)         Sample body fixed, pulling lead axis direction, 0.5N, 10±1sec.         JETTA ED-4701/400 Test Method 401         22         0           2. MEASUREMENT ITEM & CRITERIA ITEM         CONDITION         ORITERIA         ORITERIA         ORITERIA           Cutoff current : ICBO         Per specification         According to the electrical characteristics specified by the specification         DC current gain : hFE         Per specification           Physical         Visual check         No outstanding change in physical.         Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	Temperature cycle	-55±5°C←→150±5°C 200cy	-55±5°C ←→150±5°C 200cycles		22	0	
High temperature reverse bias  Tj max., specified bias , 1000hours  JESD22-A108  22  0  High temperature gate bias  Tj max, VGSS(max), , 1000hours  JESD22-A108  22  0  Intermittent Operation Life  On 120s/OFF 120s per cycle Duration: 15000cycles  Power and Temperature Cycle  Ta=-40(+0/-10)*C ~e85(+10/-0)*C, ON 300s/OFF 300s per cycle Duration: 6000cycles  JESD22 A-105  Zey 1  According to the electrical characteristics specified by the specification  Cutoff current: ICBO  Per specification  Cutoff current selbo  Per specification  Cutoff current : IEBO  Per specification  Physical  Visual check  No outstanding change in physical.  Reflow Soldering  Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	High temp. high humidity reverse	bias 85±2°C, 85±5%RH, specified	85±2°C, 85±5%RH, specified bias ,1000hours		22	0	
High temperature gate bias  Tj max, VGSS(max), 1000hours  JESD22-A108  22  0  Intermittent Operation Life ON 120s/OFF 120s per cycle Duration: 15000cycles ON 300s/OFF 300s per cycle Duration: 6000cycles  Lead strength (lead pull)  Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec.  JESD22 A-105  JESD22 A-105  JESD22 A-105  Z. MEASUREMENT ITEM & CRITERIA ITEM  CONDITION  CRITERIA  Cutoff current: ICBO  Per specification  Cutoff current: ICBO  Reflow Soldering  Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	Pressure cooker test	121±2°C , 100%RH , 203kPa ,	121±2°C , 100%RH , 203kPa , 100hours		22	0	
Ta=25±5°C. ∠Tj≥100°C. ON 120s/OFF 120s per cycle Duration: 15000cycles  or Power and Temperature Cycle  Ta=-40(+0/-10)°C ~+85(+10/-0)°C. ON 300s/OFF 300s per cycle Duration: 6000cycles  Lead strength (lead pull)  Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec.  JESD22 A=105  Lead strength (lead pull)  Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec.  JEITA ED-4701/400 Test Method 401  22  0  Z. MEASUREMENT ITEM & CRITERIA ITEM  CONDITION  CRITERIA  Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  Cutoff current gain : hFE Per specification  Physical  Visual check  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	High temperature reverse bias	Tj max., specified bias , 1000hou	Tj max., specified bias , 1000hours		22	0	
Intermittent Operation Life ON 120s/OFF 120s per cycle Duration: 15000cycles Or Power and Temperature Cycle On 300s/OFF 300s per cycle Duration: 6000cycles  Lead strength (lead pull)  Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec.  JEITA ED-4701/400 Test Method 401  22  0  Z. MEASUREMENT ITEM & CRITERIA  ITEM  CONDITION  CRITERIA  Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  According to the electrical characteristics specified by the specification  DC current gain : hFE Per specification  Physical  Visual check  No outstanding change in physical.  Reflow Soldering  Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	High temperature gate bias	Tj max, VGSS(max), , 1000hours	Tj max, VGSS(max), , 1000hours		22	0	
Power and Temperature Cycle  Ta = -40(+0/-10)°C → +85(+10/-0)°C, ON 300s/OFF 300s per cycle Duration: 6000cycles  Lead strength (lead pull)  Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec.  JEITA ED-4701/400 Test Method 401  22  0  2. MEASUREMENT ITEM & CRITERIA  ITEM CONDITION  CRITERIA  Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  Cutoff current : IEBO Per specification  DC current gain : hFE Per specification  Physical Visual check No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut−surface, must be covered by solder.		ON 120s/OFF 120s per cycle	ON 120s/OFF 120s per cycle		22	0	
Lead strength (lead pull)  Sample body fixed, pulling lead axis direction, 0.5N, 10±1sec.  Test Method 401  22  U  2. MEASUREMENT ITEM & CRITERIA  ITEM CONDITION  CRITERIA  Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  DC current gain : hFE Per specification  Physical  Visual check  No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.		ON 300s/OFF 300s per cycle		JESD22 A-105			
TIEM CONDITION CRITERIA  Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  DC current gain : hFE Per specification  Physical Visual check No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	Lead strength (lead pull)	Sample body fixed, pulling lead a	Sample body fixed, pulling lead axis direction , 0.5N , 10±1sec.		22	0	
TIEM CONDITION CRITERIA  Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  DC current gain : hFE Per specification  Physical Visual check No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.							
Cutoff current : ICBO Per specification  Cutoff current : IEBO Per specification  DC current gain : hFE Per specification  Physical Visual check No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	2. MEASUREMENT ITEM & CF						
Cutoff current : IEBO Per specification According to the electrical characteristics specified by the specification  DC current gain : hFE Per specification  Physical Visual check No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	ITEM	CONDITION	CRITERIA				
DC current gain : hFE	Cutoff current : ICBO	Per specification					
Physical Visual check No outstanding change in physical.  Reflow Soldering Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	Cutoff current : IEBO	Per specification	According to the electrical characteristics specified by the specification				
Solderability  Visual check  Reflow Soldering  Immersed surfase, other than the end of pin as cut-surface, must be covered by solder.	DC current gain : hFE	Per specification					
Solderability  Visual check  must be covered by solder.	Physical	Visual check	No outstanding change in physical.				
	Solderability	Visual check	Reflow Soldering				
Solder-bath More than 95% of the electrode must be covered with solder.			Solder-bath	More than 95% of the electrode must be covered with solder.			

### 3. JUDGEMENT

No failure is observed from each test item.

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