# IMH21

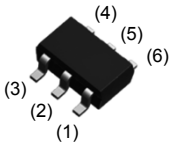
**NPN 600mA 20V Digital Transistors (Bias Resistor Built-in Transistors) For Muting.**

Datasheet

| Parameter | Tr1 and Tr2 |
|---|---|
| $V_{CEO}$ | 20V |
| $V_{EBO}$ | 12V |
| $I_C$ | 600mA |
| $R_1$ | 10kΩ |

## ●Outline

SMT6

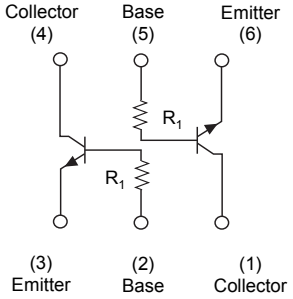



IMH21
SOT-457 (SC-74)

## ●Features

1) Built-In Biasing Resistors
2) Two DTC614T chips in one package.
3) Low saturation voltage, typically
$V_{CE(sat)}$ =40mV at $I_C$ / $I_B$=50mA / 2.5mA, makes these transistors ideal for muting circuits.
4) These transistors can be used at high current levels, $I_C$=600mA.
5) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
6) The bias resistors consist of thin-film resistors with complete isolation to allow negative biasing of the input. They also have the advantage of completely eliminating parasitic effects.
7) Lead Free/RoHS Compliant.

## ●Inner circuit




$R_1$=10kΩ

## ●Application

Muting circuit

## ●Packaging specifications

| Part No. | Package | Package size (mm) | Taping code | Reel size (mm) | Tape width (mm) | Basic ordering unit (pcs) | Marking |
|---|---|---|---|---|---|---|---|
| IMH21 | SMT6 | 2928 | T110 | 180 | 8 | 3,000 | H21 |

## ●Absolute maximum ratings (Ta = 25°C)

<For Tr1 and Tr2 in common>

| Parameter | Symbol | Values | Unit |
|---|---|---|---|
| Collector-base voltage | $V_{CBO}$ | 20 | V |
| Collector-emitter voltage | $V_{CEO}$ | 20 | V |
| Emitter-base voltage | $V_{EBO}$ | 12 | V |
| Collector current | $I_C$ | 600 | mA |
| | $I_{CP}$ *1 | 1 | A |
| Power dissipation | $P_D$ *2 | 300(Total) *3 | mW |
| Junction temperature | $T_j$ | 150 | °C |
| Range of storage temperature | $T_{stg}$ | −55 to +150 | °C |

## ●Electrical characteristics (Ta = 25°C)

<For Tr1 and Tr2 in common>

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Collector-base breakdown voltage | $BV_{CBO}$ | $I_C$= 50μA | 20 | - | - | V |
| Collector-emitter breakdown voltage | $BV_{CEO}$ | $I_C$= 1mA | 20 | - | - | V |
| Emitter-base breakdown voltage | $BV_{EBO}$ | $I_E$= 50μA | 12 | - | - | V |
| Collector cut-off current | $I_{CBO}$ | $V_{CB}$ = 20V | - | - | 0.5 | μA |
| Emitter cut-off current | $I_{EBO}$ | $V_{EB}$ = 12V | - | - | 0.5 | μA |
| Collector-emitter saturation voltage | $V_{CE(sat)}$ | $I_C$ / $I_B$= 50mA / 2.5mA | - | 40 | 150 | mV |
| DC current gain | $h_{FE}$ | $V_{CE}$= 5V, $I_C$= 50mA | 820 | - | 2700 | - |
| Input resistance | $R_1$ | - | 7 | 10 | 13 | kΩ |
| Transition frequency | $f_T$ *4 | $V_{CE}$ = 10V, $I_E$ = −50mA<br>f = 100MHz | - | 150 | - | MHz |
| Output ON Resistance | $R_{on}$ | $V_I$ = 5V<br>$R_L$ = 1kΩ, f = 1kHz | - | 0.9 | - | Ω |

*1 $P_W$=10ms, Single pulse

*2 Each terminal mounted on a reference footprint

*3 200mW per element must not be exceeded.

*4 Characteristics of built-in transistor

## ●Electrical characteristic curves(Ta = 25°C)

Fig.1 Grounded emitter propagation characteristics

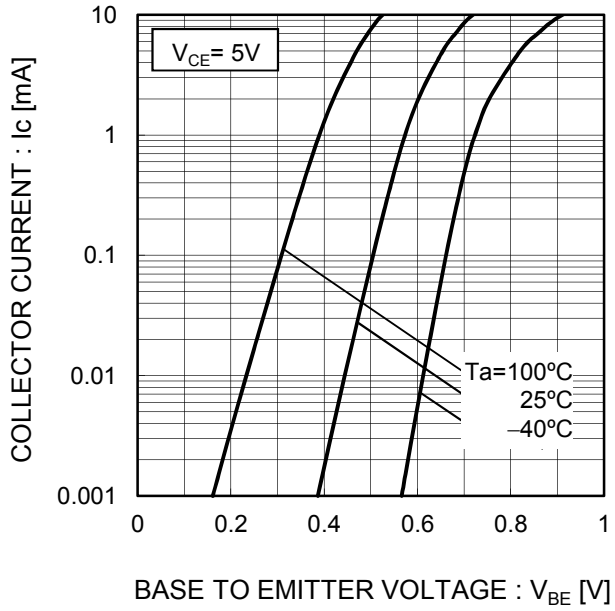



Fig.2 Grounded emitter output characteristics

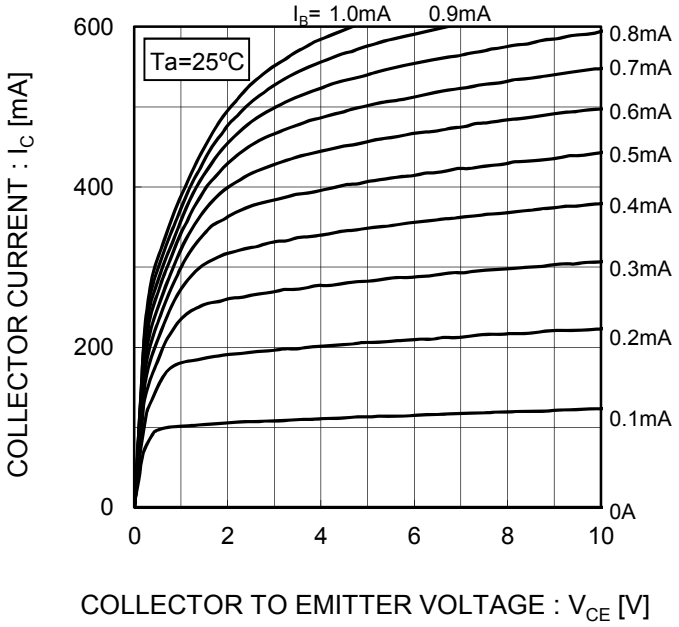



Fig.3 DC Current gain vs. Collector Current

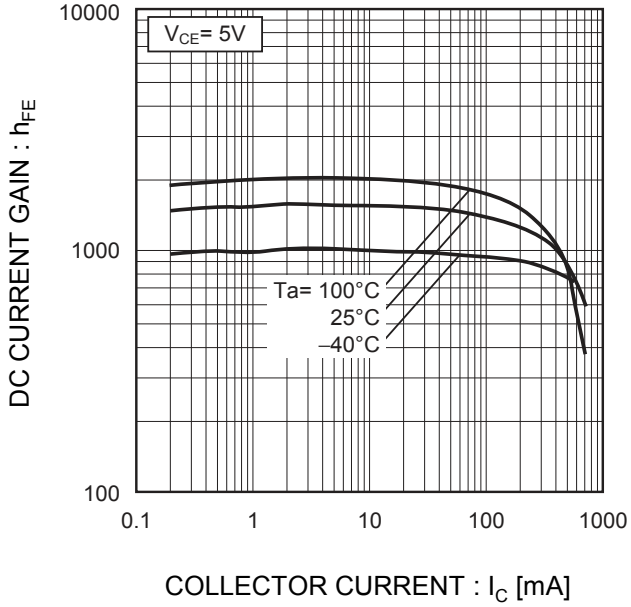
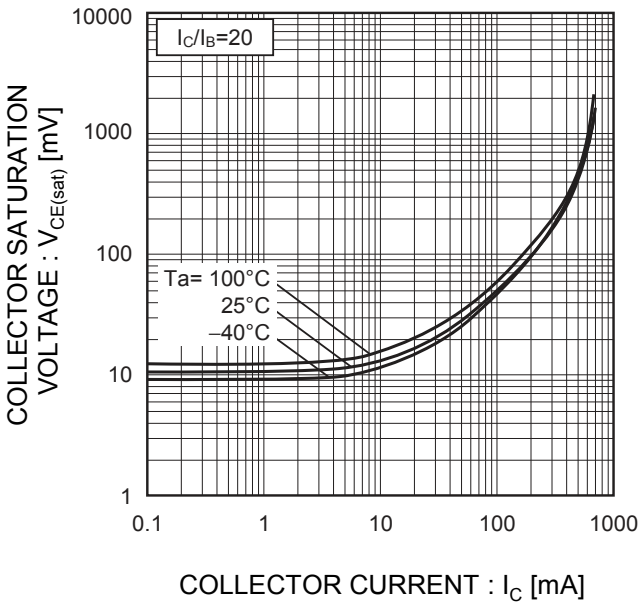



Fig.4 Collector-emitter saturation voltage vs. Collector Current



## ●Electrical characteristic curves(Ta = 25°C)

Fig.5 Output ON resistance vs. input voltage

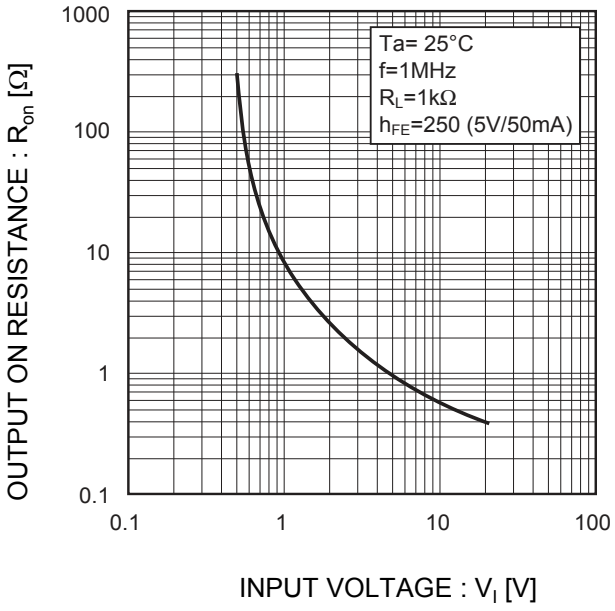
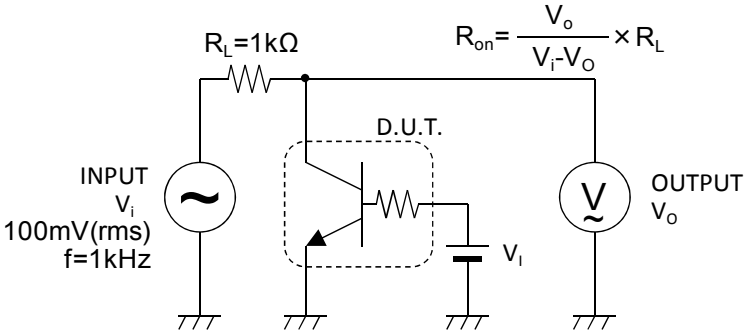
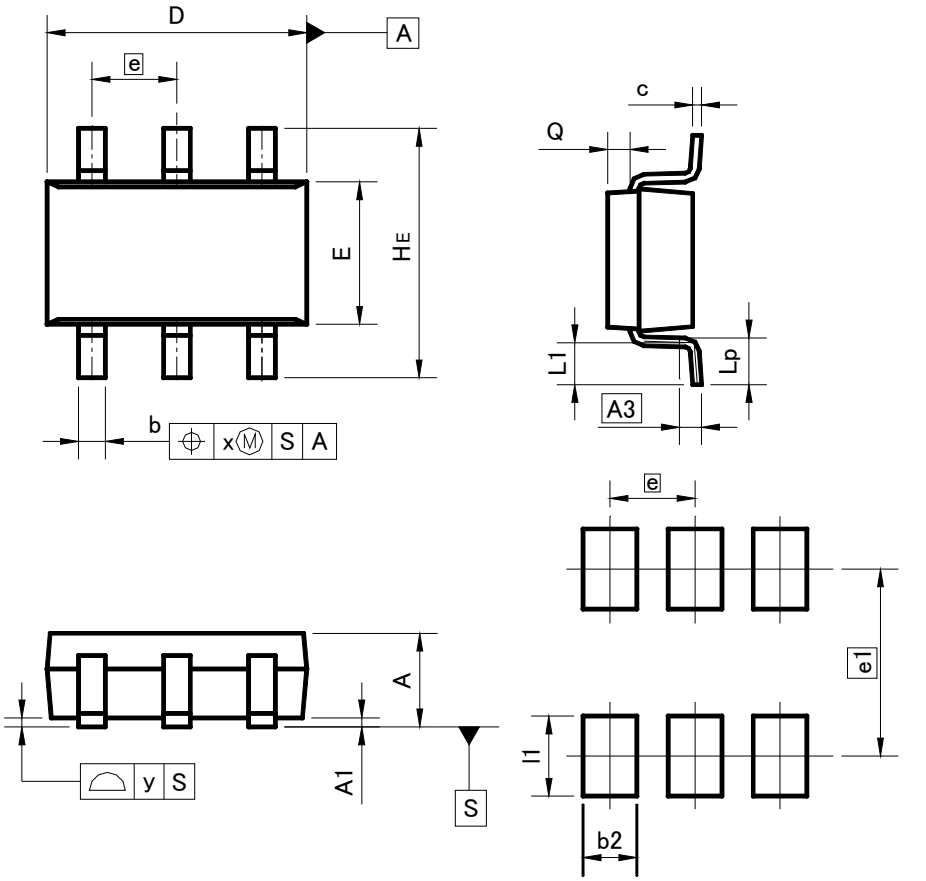



Fig.6 Ron measurement circuit.



## ●Dimensions (Unit : mm)

**SMT6**




Pattern of terminal position areas
[Not a recommended pattern of soldering pads]

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| A | 1.00 | 1.30 | 0.039 | 0.051 |
| A1 | 0.00 | 0.10 | 0.000 | 0.004 |
| A3 | 0.25 | | 0.010 | |
| b | 0.25 | 0.40 | 0.010 | 0.016 |
| c | 0.09 | 0.25 | 0.004 | 0.010 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 1.50 | 1.80 | 0.059 | 0.071 |
| e | 0.95 | | 0.037 | |
| HE | 2.60 | 3.00 | 0.102 | 0.118 |
| L1 | 0.30 | 0.60 | 0.012 | 0.024 |
| Lp | 0.40 | 0.70 | 0.016 | 0.028 |
| Q | 0.20 | 0.30 | 0.008 | 0.012 |
| x | − | 0.20 | − | 0.008 |
| y | − | 0.10 | − | 0.004 |

| DIM | MILIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| b2 | | 0.60 | − | 0.024 |
| e1 | 2.10 | | 0.083 | |
| l1 | − | 0.90 | − | 0.035 |

Dimension in mm / inches

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