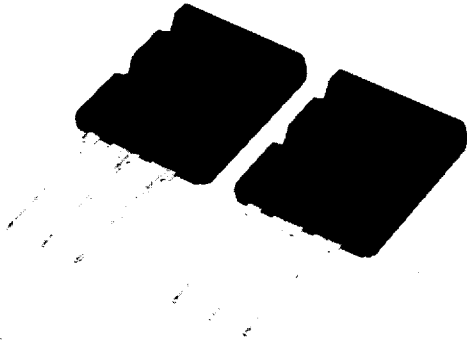


CT60AM-20

RESONANT INVERTER USE

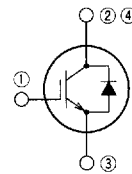
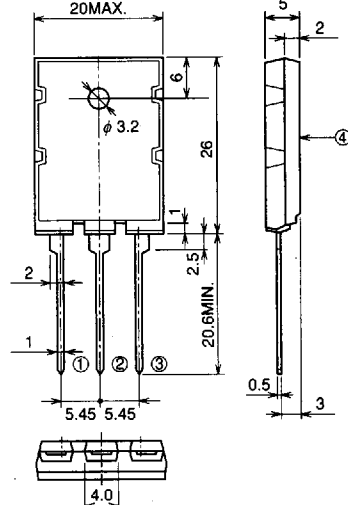
CT60AM-20



- VCES 1000V
- IC 60A
- Integrated Fast Recovery Diode

OUTLINE DRAWING

Dimensions in mm



- ① GATE
- ② COLLECTOR
- ③ EMITTER
- ④ COLLECTOR

TO-3PL

APPLICATION

Microwave ovens, electromagnetic cooking devices, rice-cookers, voltage-resonant inverter circuit electric appliances.

MAXIMUM RATINGS (Tc = 25°C)

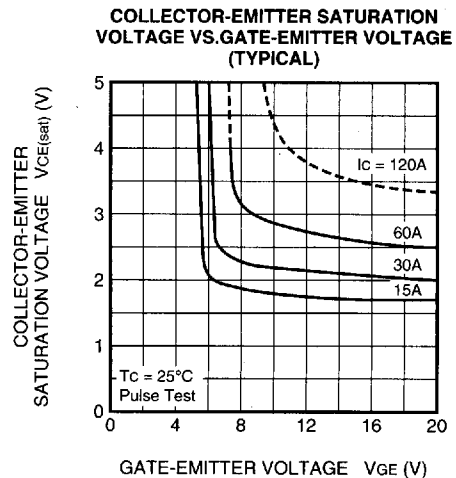
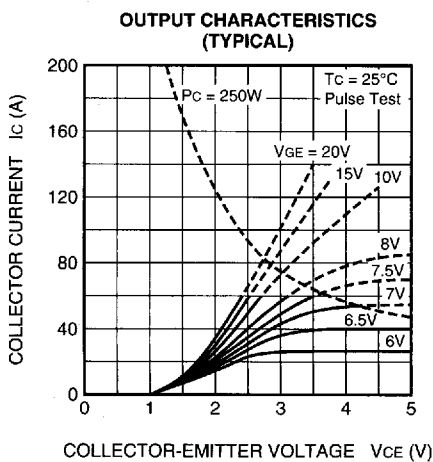
| Symbol | Parameter | Conditions | Rated Values | Unit |
|-------------------|----------------------------|---|--------------|------|
| V _{CE} S | Collector-emitter voltage | V _{GE} = 0V | 1000 | V |
| V _{GE} S | Gate-emitter voltage | V _{CE} = 0V | ±20 | V |
| V _{GEM} | Peak gate-emitter voltage | V _{CE} = 0V, t _w = 0.5s | ±30 | V |
| I _C | Collector current | | 60 | A |
| I _{CM} | Collector current (Pulsed) | t _w = 1ms | 120 | A |
| I _E | Emitter current | | 40 | A |
| P _C | Maximum power dissipation | T _c = 25°C | 250 | W |
| T _j | Junction temperature | | -40 ~ +150 | °C |
| T _{stg} | Storage temperature | | -40 ~ +150 | °C |

6249829 0020521 50T

ELECTRICAL CHARACTERISTICS ($T_j = 25^\circ\text{C}$ unless otherwise noted)

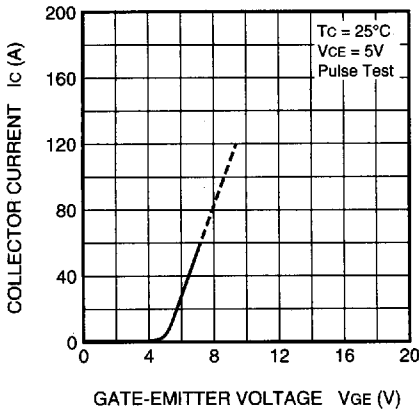
| Symbol | Parameter | Test conditions | Limits | | | Unit |
|---------------|--------------------------------------|--|--|------|-----------|---------------------------|
| | | | Min. | Typ. | Max. | |
| ICES | Collector current | $V_{CE} = 1000\text{V}, V_{GE} = 0\text{V}$ | — | — | 1 | mA |
| IGES | Gate leakage current | $V_{GE} = \pm 20\text{V}, V_{CE} = 0\text{V}$ | — | — | ± 0.5 | μA |
| $V_{GE(th)}$ | Gate-emitter threshold voltage | $V_{CE} = 10\text{V}, I_C = 6\text{mA}$ | 2.0 | — | 6.0 | V |
| $V_{CE(sat)}$ | Collector-emitter saturation voltage | $I_C = 60\text{A}, V_{CE} = 15\text{V}$ | — | 2.6 | 3.5 | V |
| C_{ies} | Input capacitance | $V_{CE} = 25\text{V}, V_{GE} = 0\text{V}, f = 1\text{MHz}$ | — | 1950 | — | pF |
| C_{oes} | Output capacitance | | — | 170 | — | pF |
| C_{res} | Reverse transfer capacitance | | — | 65 | — | pF |
| $t_d(on)$ | Turn-on delay time | | — | 0.04 | — | μs |
| t_r | Fall time | | $I_C = 60\text{A}, \text{Resistance load}$ | — | 0.15 | — |
| $t_d(off)$ | Turn-off delay time | $V_{CC} = 300\text{V}, V_{GE} = 15\text{V}, R_G = 25\Omega$ | — | 0.30 | — | μs |
| t_f | Rise time | | — | 0.30 | — | μs |
| E_{tail} | Tail loss | $I_{CP} = 60\text{A}, T_j = 125^\circ\text{C},$ $dv/dt = 200\text{V}/\mu\text{s}$ | — | 0.6 | 1.0 | mJ/pls |
| I_{Ctail} | Collector tail current | | — | 6 | 12 | A |
| V_{EC} | Emitter-collector voltage | $I_E = 60\text{A}$ | — | — | 3 | V |
| T_{rr} | Reverse recovery time | $I_E = 60\text{A}, di/dt = 20\text{A}/\mu\text{s}$ | — | 0.5 | 2 | μs |
| $R_{th(j-c)}$ | Thermal resistance (IGBT part) | Junction to case | — | — | 0.5 | $^\circ\text{C}/\text{W}$ |
| $R_{th(j-c)}$ | Thermal resistance | Junction to case | — | — | 4.0 | $^\circ\text{C}/\text{W}$ |

PERFORMANCE CURVES

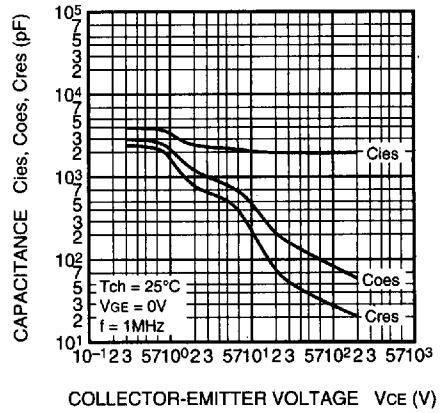


6249829 0020522 446

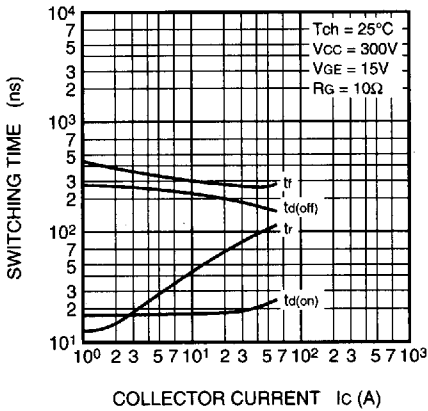
COLLECTOR CURRENT VS. GATE-EMITTER VOLTAGE (TYPICAL)



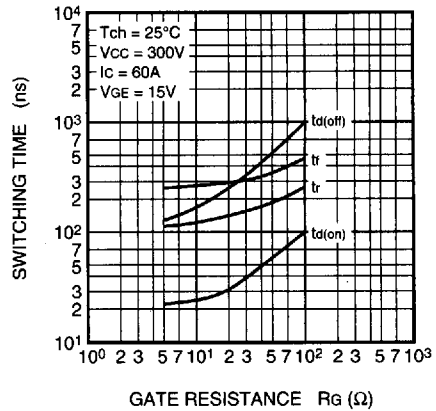
CAPACITANCE VS. COLLECTOR-EMITTER VOLTAGE (TYPICAL)



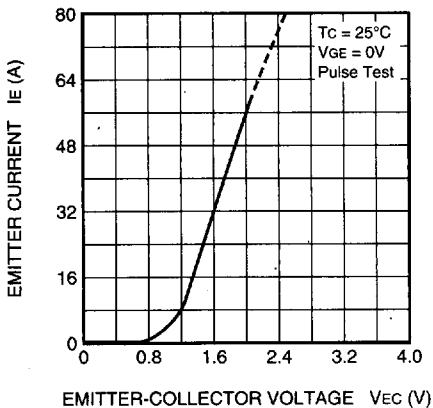
SWITCHING CHARACTERISTICS (TYPICAL)



SWITCHING TIME VS. GATE RESISTANCE (TYPICAL)



TRANSFER CHARACTERISTICS (TYPICAL)



MITSUBISHI POWER MOSFET LEAD FORMING OUTLINE AND TAPING

LEAD FORMING

(1) TO-220 outline

Applicable device FS**UM-***A

| Standard outline | Standard forming outline | | | |
|---|--------------------------|----|----|----------|
| | A5 | A6 | A8 | AA |
| | | | | |
| | | | | |
| Dimensions $a=3.0\pm 0.5$, $b=14.7\pm 0.5$, $c=5.0\pm 0.5$, $d=4.5\pm 0.5$, $e=20.1\pm 0.5$, $f=3.0\pm 0.5$, $g=15.5\pm 0.5$ $h=16.0\pm 0.5$, $i=5.5\pm 0.5$ ※Dimensions measured during processing | | | | Unit: mm |

(1) TO-220 full molded outline

Applicable device FS**KM-***A

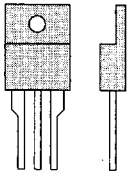
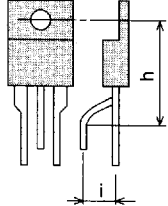
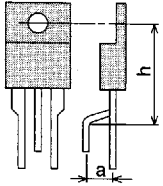
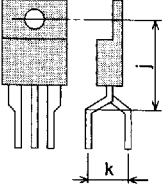
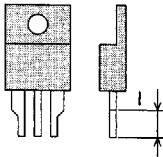
| Standard outline | Standard forming outline | | | |
|---|--------------------------|----|----|----------|
| | A5 | A6 | A8 | AA |
| | | | | |
| | | | | |
| Dimensions $a=3.0\pm 0.5$, $b=14.7\pm 0.5$, $c=5.0\pm 0.5$, $d=4.5\pm 0.5$, $e=20.1\pm 0.5$, $g=15.5\pm 0.5$, $h=16.0\pm 0.5$, $i=5.5\pm 0.5$, $j=19.0\pm 0.5$, $k=7.75\pm 0.5$, $l=4.0\pm 0.5$, $m=15.1\pm 0.5$, $n=16.5\pm 0.5$, $o=3.8\pm 0.35$ ※Dimensions measured during processing | | | | Unit: mm |

6249829 0019591 140

MITSUBISHI POWER MOSFET
LEAD FORMING OUTLINE AND TAPING

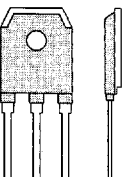
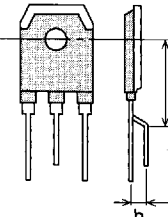
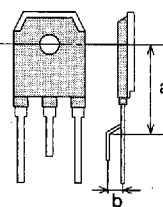
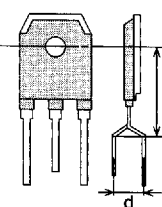
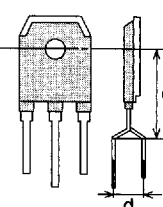
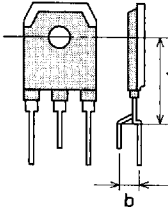
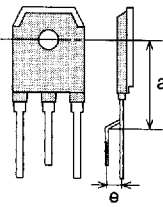
(2) TO-220 full molded outline

| | |
|-------------------|-----------|
| Applicable device | FS**KM**A |
|-------------------|-----------|

| Standard outline | Standard forming outline | | | | |
|---|--|---|---|---|-----------|
| | AT | AU | AV | AW | |
|  |  |  |  |  | |
| Dimensions | a=3.0±0.5, b=14.7±0.5, c=5.0±0.5, d=4.5±0.5, e=20.1±0.5, g=15.5±0.5, h=16.0±0.5, i=5.5±0.5, j=19.0±0.5, k=7.75±0.5, l=4.0±0.5, m=15.1±0.5, n=16.5±0.5, o=3.8±0.35 ※Dimensions measured during processing | | | | Unit : mm |

(3) TO-3P outline

| | |
|-------------------|----------------------|
| Applicable device | FS**SM**A · CT**SM** |
|-------------------|----------------------|

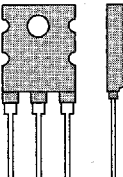
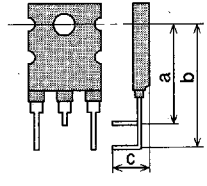
| Standard outline | Standard forming outline | | | | |
|--|---|---|--|--|-----------|
| | A7 | A8 | A9 | A8 | |
|  |  |  |  |  | |
| |  |  | | | |
| Dimensions | a=23.5, b=5.45, c=23, d=9.5, e=4, f=21.5 ※Dimensions measured during processing | | | | Unit : mm |

MITSUBISHI POWER MOSFET

LEAD FORMING OUTLINE AND TAPING

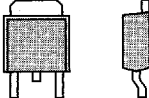
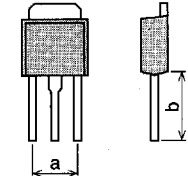
(4) TO-3PL outline

| | |
|-------------------|------------|
| Applicable device | CT**AM-*** |
|-------------------|------------|

| Standard outline | Standard forming outline AC | | |
|--|---|------------|---|
|  |  | Dimensions | <p style="text-align: right;">Unit : mm</p> <p>a=24±0.5 b=31.5±0.5 c=13.3±0.6</p> <p>※Dimensions measured during processing</p> |

(5) MP-3 outline

| | |
|-------------------|-------------------------|
| Applicable device | FS**AS-***A · CT20A**·8 |
|-------------------|-------------------------|

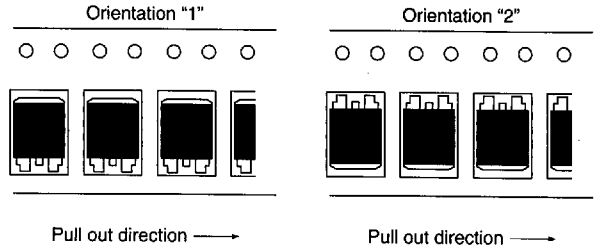
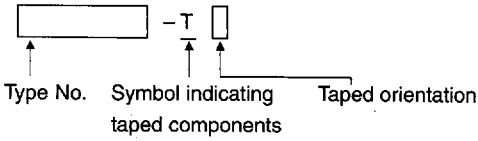
| Standard outline | Standard forming outline A1 | | |
|--|--|------------|---|
|  |  | Dimensions | <p style="text-align: right;">Unit : mm</p> <p>a=4.6 b=14min.</p> <p>※Dimensions measured during processing</p> |

LEAD FORMING OUTLINE AND TAPING

TAPING

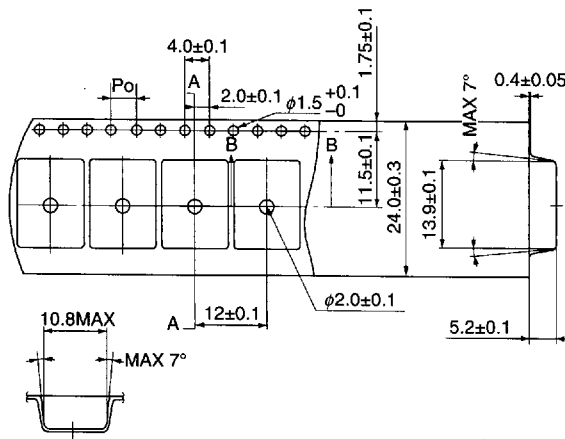
(1) TO-220S

(a) Marking



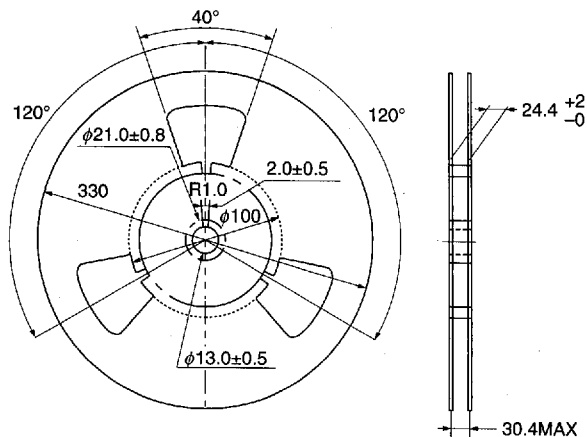
(b) Taping

- Tape shape and dimensions



Notice : The cumulative pitch error of Po (Free hole pitch) is $\pm 0.2\text{mm}$ per 10 pitches.

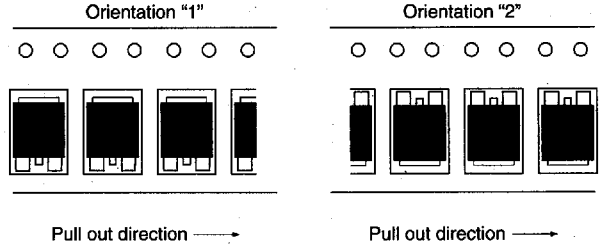
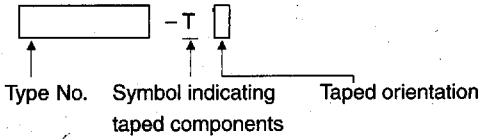
- Reel shape and dimensions



LEAD FORMING OUTLINE AND TAPING

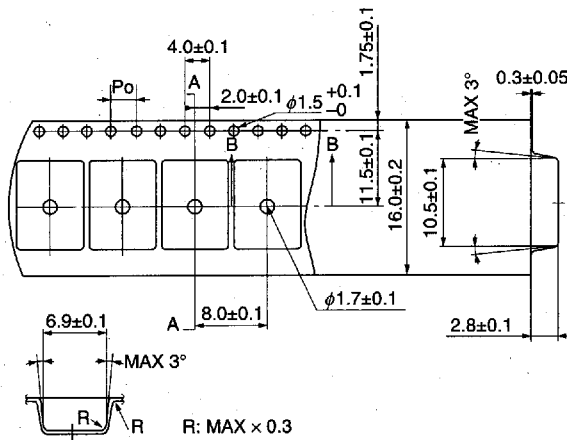
(2) MP-3

(a) Marking



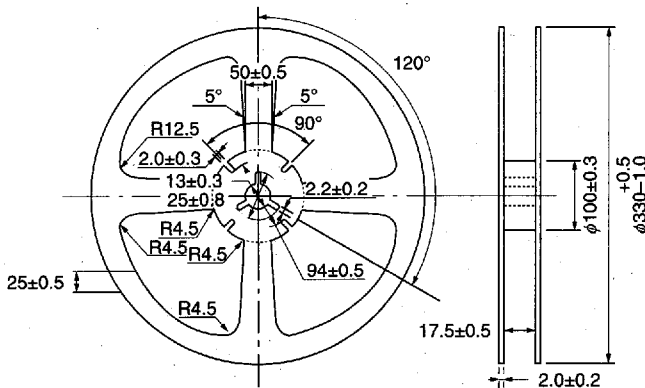
(b) Taping

- Tape shape and dimensions



Notice : The cumulative pitch error of Po (Free hole pitch) is $\pm 0.2\text{mm}$ per 10 pitches.

- Reel shape and dimensions

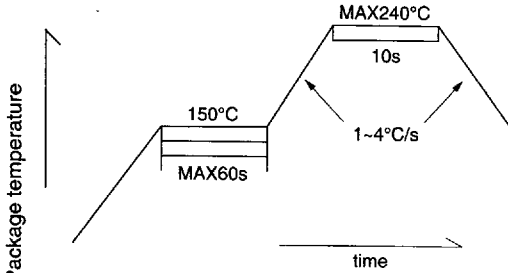


LEAD FORMING OUTLINE AND TAPING

Recommended conditions for surface mounting type

Outline : TO-220S, MP-3

- (1) Board : Alumina, Insulated metal board
- (2) Solder plate thickness : 150 μ m-250 μ m
- (3) Temperature profile

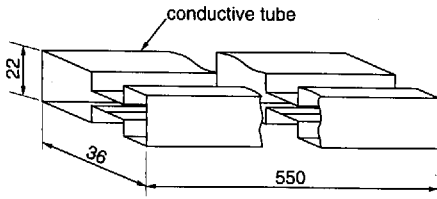


Infrared rays reflow temperature profile

Individual package for lead forming outline

- (1) TO-220, TO-220FN, TO-220C, TO-220S

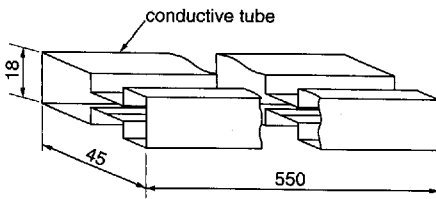
Dimensions in (Unit : mm)



The capacity is 50 p.c.s. (max.)

- (2) TO-3P

Dimensions in (Unit : mm)



The capacity is 30 p.c.s. (max.)