

Silicon Diffused Power Transistor

BU4522DX

GENERAL DESCRIPTION

Enhanced performance, new generation, high-voltage, high-speed switching npn transistor with an integrated damper diode in a plastic full-pack envelope intended for use in horizontal deflection circuits of colour television receivers and p.c monitors. Features exceptional tolerance to base drive and collector current load variations resulting in a very low worst case dissipation.

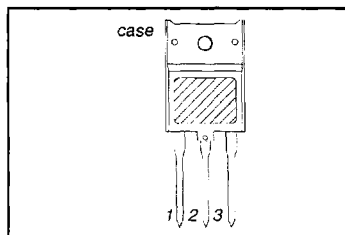
QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|-------------|---------------------------------------|--|-------|-------|------|
| V_{CESM} | Collector-emitter voltage peak value | $V_{BE} = 0 \text{ V}$ | - | 1500 | V |
| V_{CEO} | Collector-emitter voltage (open base) | | - | 800 | V |
| I_C | Collector current (DC) | | - | 10 | A |
| I_{CM} | Collector current peak value | | - | 25 | A |
| P_{tot} | Total power dissipation | $T_{ns} \leq 25 \text{ }^\circ\text{C}$ | - | 45 | W |
| V_{CESat} | Collector-emitter saturation voltage | $I_C = 7 \text{ A}; I_B = 1.75 \text{ A}$ | - | 3.0 | V |
| I_{Csat} | Collector saturation current (Fig 17) | $f = 16 \text{ kHz}$ | 7 | - | A |
| | | $f = 64 \text{ kHz}$ | 6 | - | A |
| V_F | Diode forward voltage | $I_F = 7.0 \text{ A}$ | - | 2.2 | V |
| t_f | Fall time | $I_{Csat} = 7 \text{ A}; f = 16 \text{ kHz}$ | 285 | 400 | ns |
| | | $f = 64 \text{ kHz}$ | t.b.f | t.b.f | ns |

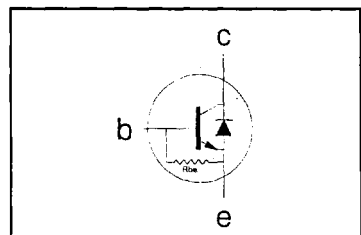
PINNING - SOT399

| PIN | DESCRIPTION |
|------|-------------|
| 1 | base |
| 2 | collector |
| 3 | emitter |
| case | isolated |

PIN CONFIGURATION



SYMBOL



LIMITING VALUES

Limiting values in accordance with the Absolute Maximum Rating System (IEC 134)

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|------------|--|---|------|------|------------------|
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| V_{CEO} | Collector-emitter voltage (open base) | | - | 800 | V |
| I_C | Collector current (DC) | | - | 10 | A |
| I_{CM} | Collector current peak value | | - | 25 | A |
| I_B | Base current (DC) | | - | 6 | A |
| I_{BM} | Base current peak value | | - | 9 | A |
| $-I_{BM}$ | Reverse base current peak value ¹ | | - | 6 | A |
| P_{tot} | Total power dissipation | $T_{ns} \leq 25 \text{ }^\circ\text{C}$ | - | 45 | W |
| T_{stg} | Storage temperature | | -55 | 150 | $^\circ\text{C}$ |
| T_j | Junction temperature | | - | 150 | $^\circ\text{C}$ |

¹ Turn-off current.

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THERMAL RESISTANCES

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|--------------|----------------------|------------------------|------|------|------|
| R_{th-jhs} | Junction to heatsink | with heatsink compound | - | 2.8 | K/W |
| R_{th-ja} | Junction to ambient | in free air | 35 | - | K/W |

ISOLATION LIMITING VALUE & CHARACTERISTIC

 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|------------|---|---------------------------------------|------|------|------|------|
| V_{isol} | Repetitive peak voltage from all three terminals to external heatsink | R.H. $\leq 65\%$; clean and dustfree | - | - | 2500 | V |
| C_{isol} | Capacitance from T2 to external heatsink | $f = 1\text{ MHz}$ | - | 22 | - | pF |

STATIC CHARACTERISTICS

 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | MIN. | TYP. | MAX. | UNIT |
|---------------|--|--|------|------|------|----------|
| I_{CES} | Collector cut-off current ² | $V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ | - | - | 1.0 | mA |
| I_{CES} | | $V_{BE} = 0\text{ V}; V_{CE} = V_{CESMmax}$ $T_j = 125\text{ }^{\circ}\text{C}$ | - | - | 2.0 | mA |
| BV_{EBO} | Emitter-base breakdown voltage | $I_B = 600\text{ mA}$ | 7.5 | 13.5 | - | V |
| R_{be} | Base-emitter resistance | $V_{EB} = 7.5\text{ V}$ | - | 50 | - | Ω |
| $V_{CE0sust}$ | Collector-emitter sustaining voltage | $I_B = 0\text{ A}; I_C = 100\text{ mA};$ $L = 25\text{ mH}$ | 800 | - | - | V |
| V_{CEsat} | Collector-emitter saturation voltage | $I_C = 7\text{ A}; I_B = 1.75\text{ A}$ | - | - | 3.0 | V |
| V_{BEsat} | Base-emitter saturation voltage | $I_C = 7\text{ A}; I_B = 1.75\text{ A}$ | 0.85 | 0.94 | 1.03 | V |
| h_{FE} | DC current gain | $I_C = 1\text{ A}; V_{CE} = 5\text{ V}$ | - | 10 | - | - |
| h_{FE} | Diode forward voltage | $I_C = 7\text{ A}; V_{CE} = 5\text{ V}$ | 4.2 | 5.8 | 7.3 | - |
| V_F | | $I_F = 7\text{ A}$ | - | - | 2.2 | V |

DYNAMIC CHARACTERISTICS

 $T_{hs} = 25\text{ }^{\circ}\text{C}$ unless otherwise specified

| SYMBOL | PARAMETER | CONDITIONS | TYP. | MAX. | UNIT |
|--------|--|--|-------|-------|---------------|
| t_s | Switching times (16 kHz line deflection circuit) | $f = 16\text{ kHz}; I_{Csat} = 7\text{ A}; I_{B1} = 1.4\text{ A};$ $(I_{B2} = -3.5\text{ A})$ | 3.5 | 4.3 | μs |
| t_f | | | | | |
| t_s | Switching times (64 kHz line deflection circuit) | $I_{Csat} = t.b.f$ | t.b.f | t.b.f | μs |
| t_f | | | | | |

2 Measured with half sine-wave voltage (curve tracer).