

30V N-CANNEL ENHANCEMENT MODE MOSFET

SUMMARY

$V_{(BR)DSS}=30V$; $R_{DS(ON)}=0.11\Omega$; $I_D=3.2A$

DESCRIPTION

This new generation of high density MOSFETs from Zetex utilise a unique structure that combines the benefits of low on-resistance with fast switching speed. This makes them ideal for high efficiency, low voltage, power management applications.

FEATURES

- Low on-resistance
- Fast switching speed
- Low threshold
- Low gate drive
- SOT23-6 package

APPLICATIONS

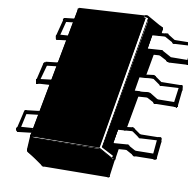
- DC - DC Converters
- Power Management Functions
- Disconnect switches
- Motor control

ORDERING INFORMATION

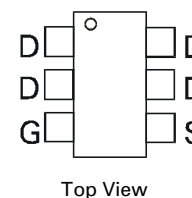
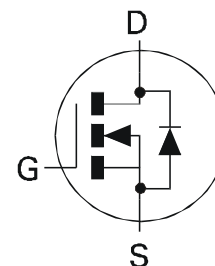
| DEVICE | REEL SIZE (inches) | TAPE WIDTH (mm) | QUANTITY PER REEL |
|--------------|--------------------|-----------------|-------------------|
| ZXM62N03E6TA | 7 | 8mm embossed | 3000 units |
| ZXM62N03E6TC | 13 | 8mm embossed | 10000 units |

DEVICE MARKING

- 2N03



SOT23-6



ZXM62N03E6

ABSOLUTE MAXIMUM RATINGS.

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|-----------|-------------|---------------------|
| Drain-Source Voltage | V_{DSS} | 30 | V |
| Gate Source Voltage | V_{GS} | ± 20 | V |
| Continuous Drain Current ($V_{GS}=10V$; $T_A=25^\circ C$)(b) ($V_{GS}=10V$; $T_A=70^\circ C$)(b) | I_D | 3.2 2.6 | A |
| Pulsed Drain Current (c) | I_{DM} | 18 | A |
| Continuous Source Current (Body Diode) (b) | I_S | 2.1 | A |
| Pulsed Source Current (Body Diode) | I_{SM} | 18 | A |
| Power Dissipation at $T_A=25^\circ C$ (a) Linear Derating Factor | P_D | 1.1 8.8 | W mW/ $^\circ C$ |
| Power Dissipation at $T_A=25^\circ C$ (b) Linear Derating Factor | P_D | 1.7 13.6 | W mW/ $^\circ C$ |

THERMAL RESISTANCE

| PARAMETER | SYMBOL | VALUE | UNIT |
|-------------------------|-----------------|-------|--------------|
| Junction to Ambient (a) | $R_{\theta JA}$ | 113 | $^\circ C/W$ |
| Junction to Ambient (b) | $R_{\theta JA}$ | 73 | $^\circ C/W$ |

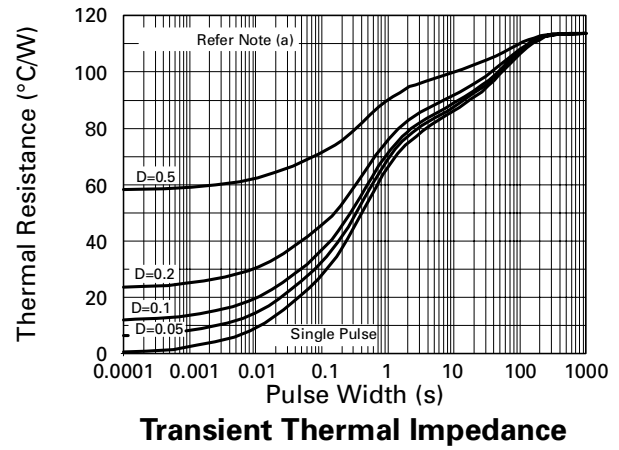
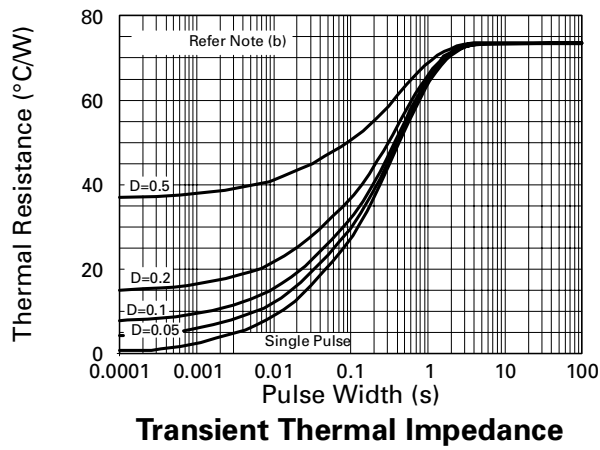
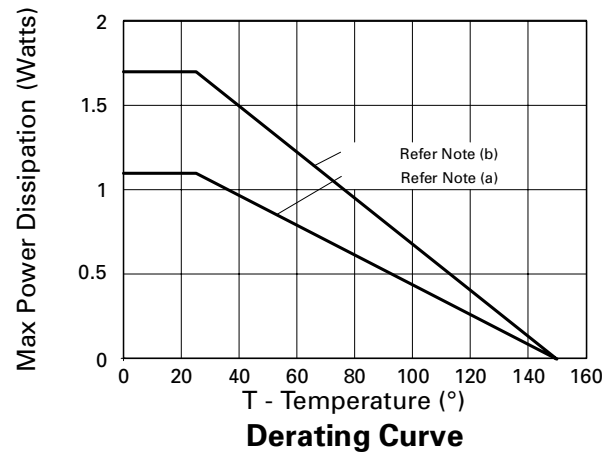
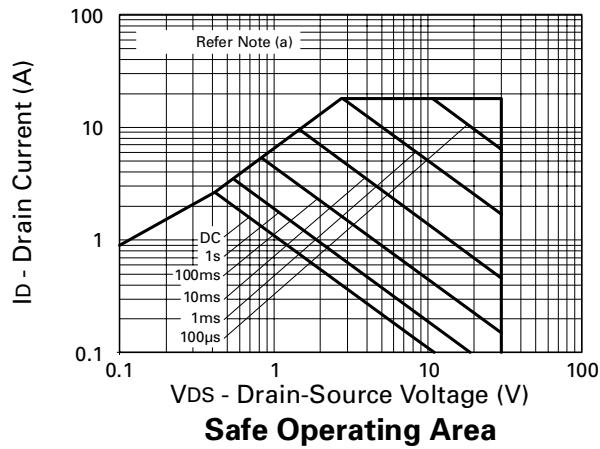
NOTES

(a) For a device surface mounted on 25mm x 25mm FR4 PCB with high coverage of single sided 1oz copper, in still air conditions

(b) For a device surface mounted on FR4 PCB measured at $t \leq 5$ secs.

(c) Repetitive rating - pulse width limited by maximum junction temperature. Refer to Transient Thermal Impedance graph.

CHARACTERISTICS



ZXM62N03E6

ELECTRICAL CHARACTERISTICS (at $T_{amb} = 25^{\circ}\text{C}$ unless otherwise stated).

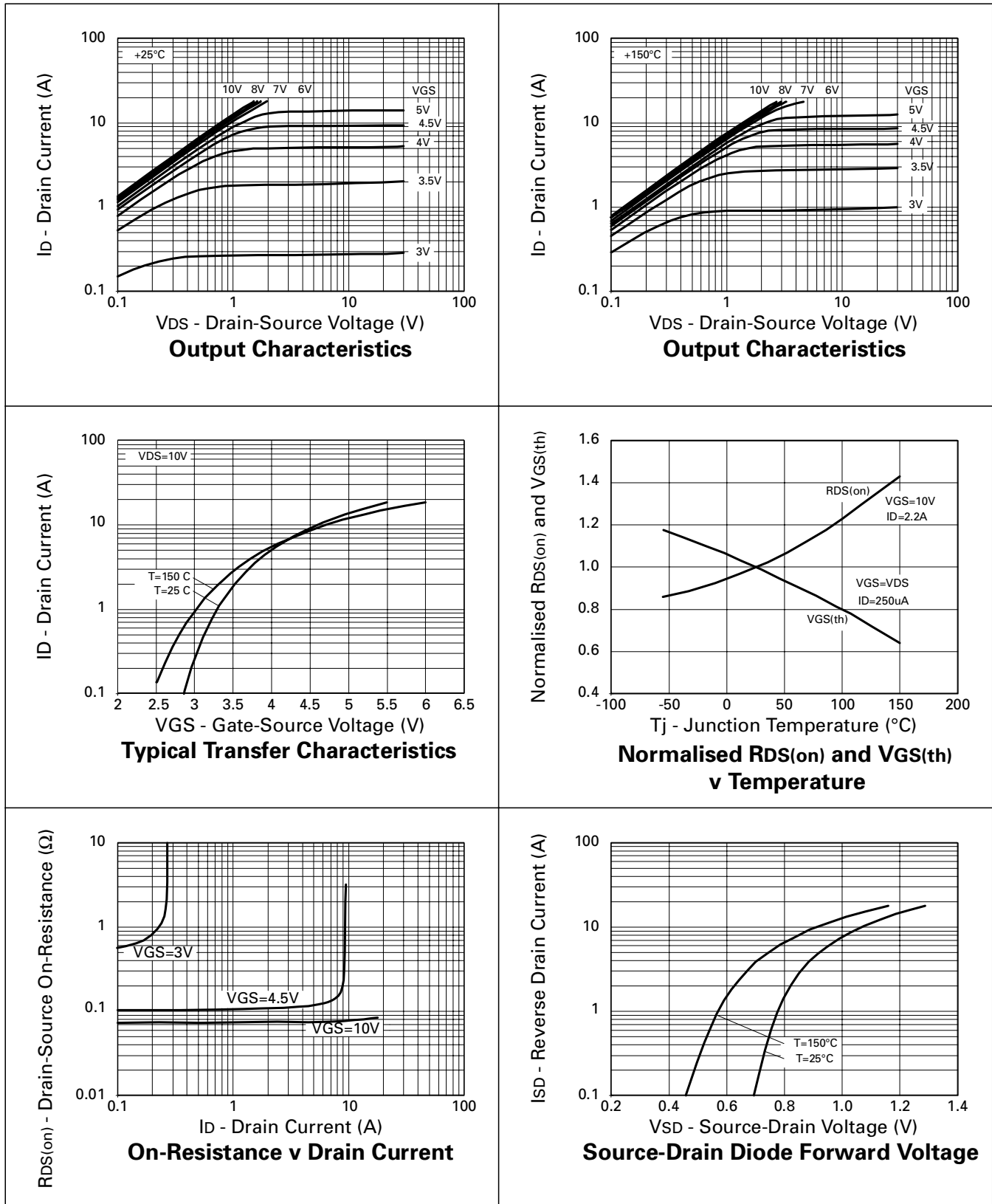
| PARAMETER | SYMBOL | MIN. | TYP. | MAX. | UNIT | CONDITIONS. |
|---|---------------|------|------|--------------|----------------------|---|
| STATIC | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 30 | | | V | $I_D=250\mu\text{A}, V_{GS}=0\text{V}$ |
| Zero Gate Voltage Drain Current | I_{DSS} | | | 1 | μA | $V_{DS}=30\text{V}, V_{GS}=0\text{V}$ |
| Gate-Body Leakage | I_{GSS} | | | 100 | nA | $V_{GS}=\pm 20\text{V}, V_{DS}=0\text{V}$ |
| Gate-Source Threshold Voltage | $V_{GS(th)}$ | 1.0 | | | V | $I_D=250\mu\text{A}, V_{DS}=V_{GS}$ |
| Static Drain-Source On-State Resistance (1) | $R_{DS(on)}$ | | | 0.11 0.15 | Ω Ω | $V_{GS}=10\text{V}, I_D=2.2\text{A}$ $V_{GS}=4.5\text{V}, I_D=1.1\text{A}$ |
| Forward Transconductance | g_{fs} | 1.1 | | | S | $V_{DS}=10\text{V}, I_D=1.1\text{A}$ |
| DYNAMIC (3) | | | | | | |
| Input Capacitance | C_{iss} | | 380 | | pF | $V_{DS}=25\text{V}, V_{GS}=0\text{V},$ $f=1\text{MHz}$ |
| Output Capacitance | C_{oss} | | 90 | | pF | |
| Reverse Transfer Capacitance | C_{rss} | | 30 | | pF | |
| SWITCHING(2) (3) | | | | | | |
| Turn-On Delay Time | $t_{d(on)}$ | | 2.9 | | ns | $V_{DD}=15\text{V}, I_D=2.2\text{A}$ $R_G=6.0\Omega, R_D=6.7\Omega$ (refer to test circuit) |
| Rise Time | t_r | | 5.6 | | ns | |
| Turn-Off Delay Time | $t_{d(off)}$ | | 11.7 | | ns | |
| Fall Time | t_f | | 6.4 | | ns | |
| Total Gate Charge | Q_g | | | 9.6 | nC | $V_{DS}=24\text{V}, V_{GS}=10\text{V},$ $I_D=2.2\text{A}$ (refer to test circuit) |
| Gate-Source Charge | Q_{gs} | | | 1.7 | nC | |
| Gate Drain Charge | Q_{gd} | | | 2.8 | nC | |
| SOURCE-DRAIN DIODE | | | | | | |
| Diode Forward Voltage (1) | V_{SD} | | | 0.95 | V | $T_j=25^{\circ}\text{C}, I_S=2.2\text{A},$ $V_{GS}=0\text{V}$ |
| Reverse Recovery Time (3) | t_{rr} | | 18.8 | | ns | $T_j=25^{\circ}\text{C}, I_F=2.2\text{A},$ $di/dt= 100\text{A}/\mu\text{s}$ |
| Reverse Recovery Charge (3) | Q_{rr} | | 11.4 | | nC | |

(1) Measured under pulsed conditions. Width=300 μs . Duty cycle $\leq 2\%$.

(2) Switching characteristics are independent of operating junction temperature.

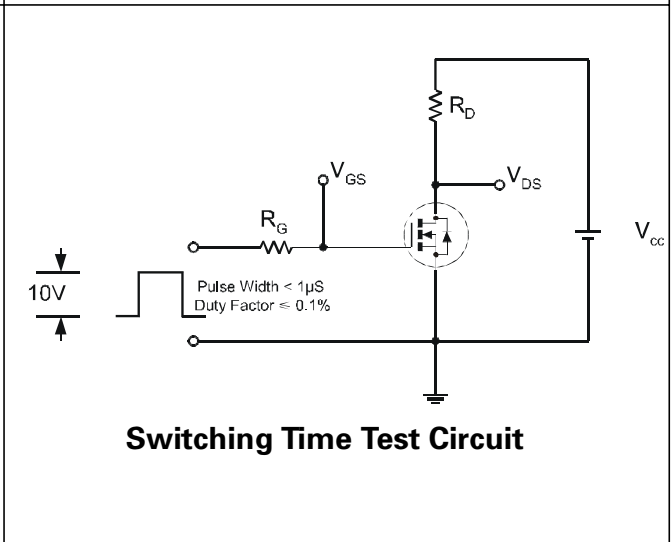
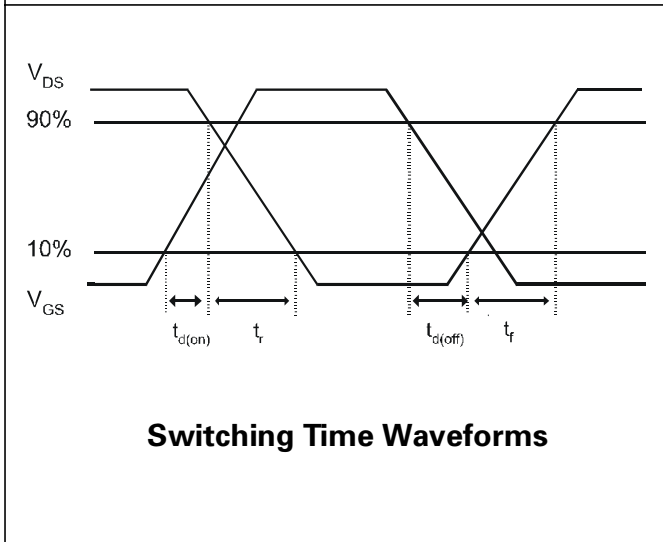
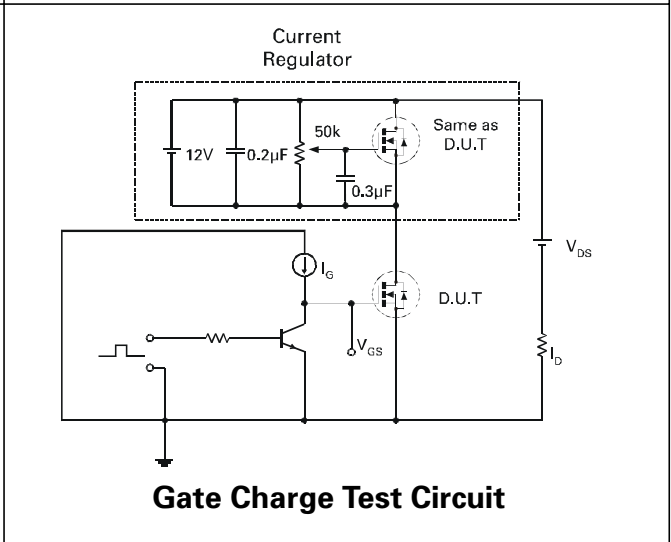
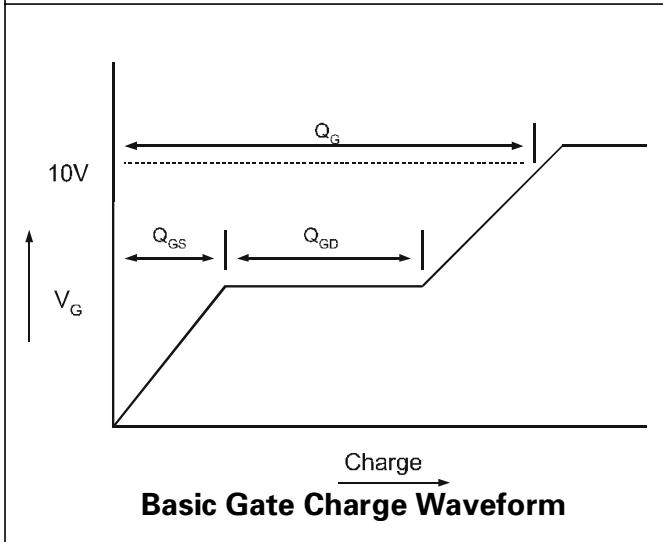
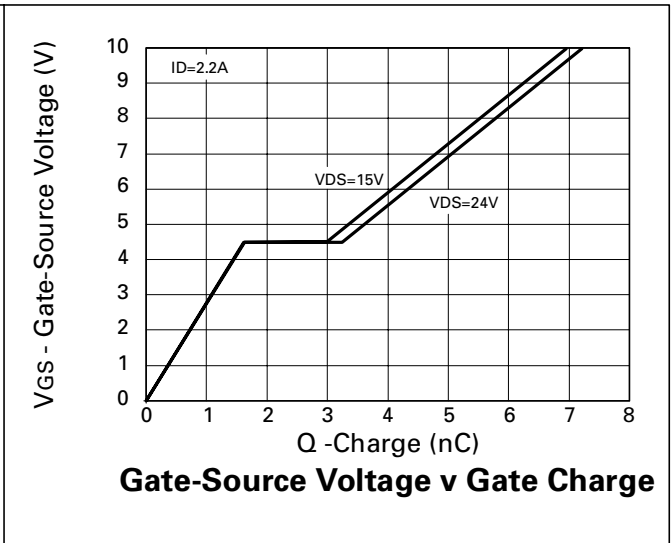
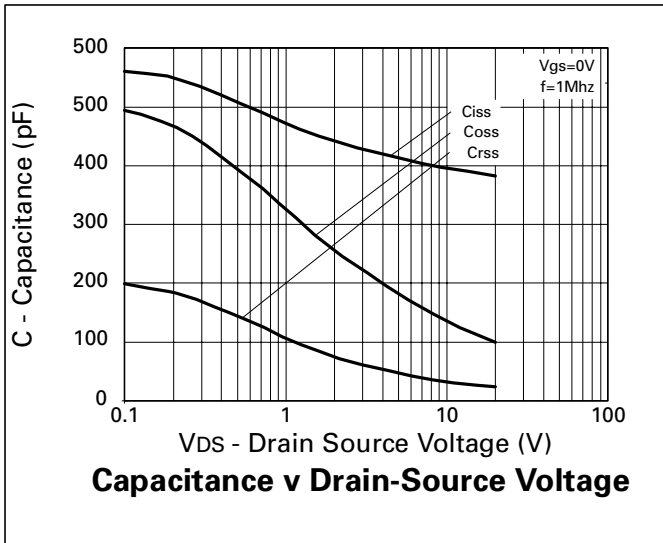
(3) For design aid only, not subject to production testing.

TYPICAL CHARACTERISTICS



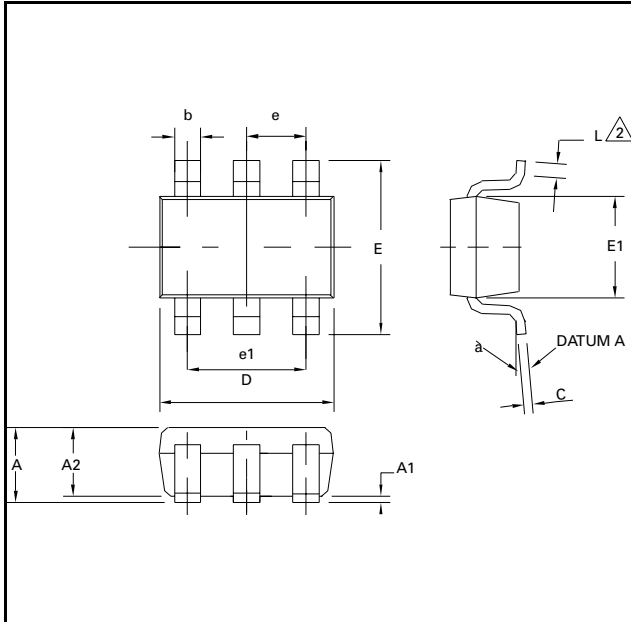
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TYPICAL CHARACTERISTICS



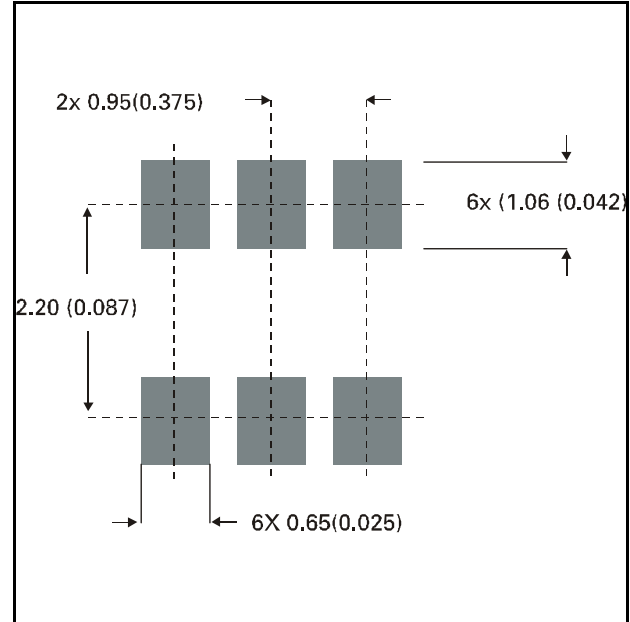
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PACKAGE DIMENSIONS



| DIM | Millimetres | | Inches | |
|-----|-------------|------|--------|-------|
| | Min | Max | Min | Max |
| A | 0.90 | 1.45 | 0.35 | 0.057 |
| A1 | 0.00 | 0.15 | 0 | 0.006 |
| A2 | 0.90 | 1.30 | 0.035 | 0.051 |
| b | 0.35 | 0.50 | 0.014 | 0.019 |
| C | 0.09 | 0.20 | 0.0035 | 0.008 |
| D | 2.80 | 3.00 | 0.110 | 0.118 |
| E | 2.60 | 3.00 | 0.102 | 0.118 |
| E1 | 1.50 | 1.75 | 0.059 | 0.069 |
| L | 0.10 | 0.60 | 0.004 | 0.002 |

PAD LAYOUT DETAILS



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