

### General Description

Advanced trench MOSFET technology with a low resistance package to provide extremely low  $R_{DS(ON)}$ .  
 one N channel MOSFET and one P channel MOSFET in one package.

### Features

Trench technology

$R_{DS(ON)}$

### Thermal resistance

| Parameter                              | Symbol     | Min. | Typ. | Max. | Unit           |
|--|------------|------|------|------|----------------|
| Thermal resistance, junction - case    | $R_{thJC}$ | -    | -    | 34   | $^{\circ} C/W$ |
| Thermal resistance, junction - ambient | $R_{thJA}$ | -    | -    | 180  | $^{\circ} C/W$ |
|  | $T_{sold}$ | -    | -    | 260  | $^{\circ} C$   |

### N Channel Absolute Maximum Ratings $T_C = 25$

| Parameter                | Symbol            | Rating   | Unit |
|--------------------------|-------------------|----------|------|
| Drain-Source Voltage     | $V_{DS}$          | 40       | V    |
| Gate-Source Voltage      | $V_{GS}$          | $\pm 20$ | V    |
| Continuous Drain Current | $I_D @ T_C = 25$  | 6        | A    |
|                          | $I_D @ T_C = 75$  | 4.5      | A    |
|                          | $I_D @ T_C = 100$ | 3.8      | A    |

|                                |              |            |    |
|--------------------------------|--------------|------------|----|
| Pulsed Drain Current           | $I_{DM}$     | 18         | A  |
| Total Power Dissipation        | $P_D@T_C=25$ | 3.6        | W  |
| Total Power Dissipation        | $P_D@T_A=25$ | 0.69       | W  |
| Operating Junction Temperature | $T_J$        | -55 to 150 |    |
| Storage Temperature            | $T_{STG}$    | -55 to 150 |    |
| Single Pulse Avalanche Energy  | $E_{AS}$     | 27         | mJ |

### N Channel Electronic Characteristics

| Parameter                         | Symbol       | Condition                         | Min. | Typ | Max. | Unit    |
|-----------------------------------|--------------|-----------------------------------|------|-----|------|---------|
| Drain-Source Breakdown Voltage    | $BV_{DSS}$   | $V_{GS} = 0V, I_D = 250\mu A$     | 40   |     |      | V       |
| Gate Threshold Voltage            | $V_{GS(TH)}$ | $V_{GS} = V_{DS}, I_D = 250\mu A$ | 1.4  | 1.6 | 2.5  | V       |
| Drain-Source Leakage Current      | $I_{DSS}$    | $V_{DS} = 40V, V_{GS} = 0V$       |      |     | 1.0  | $\mu A$ |
| Gate- Source Leakage Current      | $I_{GSS}$    | $V_{GS} = \pm 20V, V_{DS} = 0V$   |      |     | 100  | nA      |
| Static Drain-source On Resistance |              | $V_{GS} = 10V, I_D = 6A$          |      |     |      |         |
|                                   |              | $V_{GS} = 4.5V, I_D = 4A$         |      |     |      |         |
| Forward Transconductance          | $g_{FS}$     | $V_{DS} = 25V, I_D = 5A$          |      |     |      |         |
| Source-drain voltage              | $V_{SD}$     | $I_S = 6A$                        |      |     |      |         |

### N Channel Dynamic Characteristics

| Parameter                    | Symbol      | Condition                                      | Min. | Typ | Max. | Unit |
|------------------------------|-------------|--|------|-----|------|------|
| Input capacitance            | $C_{iss}$   | $f = 1MHz,$<br>$V_{DS} = 25V$                  | -    | 805 | -    | pF   |
| Output capacitance           | $C_{oss}$   |  | -    | 94  | -    |      |
| Reverse transfer capacitance | $C_{rss}$   |  | -    | 58  | -    |      |
| Gate Resistance              | $R_g$       | $f = 1MHz$                                     |      | 1.2 |      |      |
| Total gate charge            | $Q_g$       | $V_{DD} = 15V$<br>$I_D = 6A$<br>$V_{GS} = 10V$ | -    | 12  | -    | nC   |
| Gate - Source charge         | $Q_{gs}$    |  | -    | 3.1 | -    |      |
| Gate - Drain charge          | $Q_{gd}$    |  | -    | 2.8 | -    |      |
| Turn-ON Delay time           | $t_{D(on)}$ |  |      | 6   |      | ns   |
| Turn-ON Rise time            |             |  |      | 16  |      | ns   |
| Turn-Off Delay time          |             |  |      | 28  |      | ns   |
| Turn-Off Fall time           |             |  |      | 13  |      | ns   |
|                              |             |  |      | 11  |      | ns   |
|                              |             |  |      | 24  |      | nC   |

**P Channel Absolute Maximum Ratings  $T_C = 25$** 

| Parameter                      | Symbol            | Rating     | Unit |
|--------------------------------|-------------------|------------|------|
| Drain-Source Voltage           | $V_{DS}$          | -40        | V    |
| Gate-Source Voltage            | $V_{GS}$          | $\pm 20$   | V    |
| Continuous Drain Current       | $I_D @ T_C = 25$  | -5         | A    |
|                                | $I_D @ T_C = 75$  | -3.8       | A    |
|                                | $I_D @ T_C = 100$ | -3.1       | A    |
| Pulsed Drain Current           | $I_{DM}$          | -15        | A    |
| Total Power Dissipation        | $P_D @ T_C = 25$  | 3.6        | W    |
| Total Power Dissipation        | $P_D @ T_A = 25$  | 0.69       | W    |
| Operating Junction Temperature | $T_J$             | -55 to 150 |      |
| Storage Temperature            | $T_{STG}$         | -55 to 150 |      |

|                     |             |  |      |  |    |
|---------------------|-------------|--|------|--|----|
| Turn-ON Delay time  | $t_{D(on)}$ |  | 13.2 |  | ns |
| Turn-ON Rise time   |             |  | 5.5  |  | ns |
| Turn-Off Delay time |             |  | 42   |  | ns |
| Turn-Off Fall time  |             |  | 47   |  | ns |
|                     |             |  | 21   |  | ns |
|                     |             |  | 24   |  | nC |

**N Channel characteristics curve**

Fig.1 Power Dissipation Derating Curve

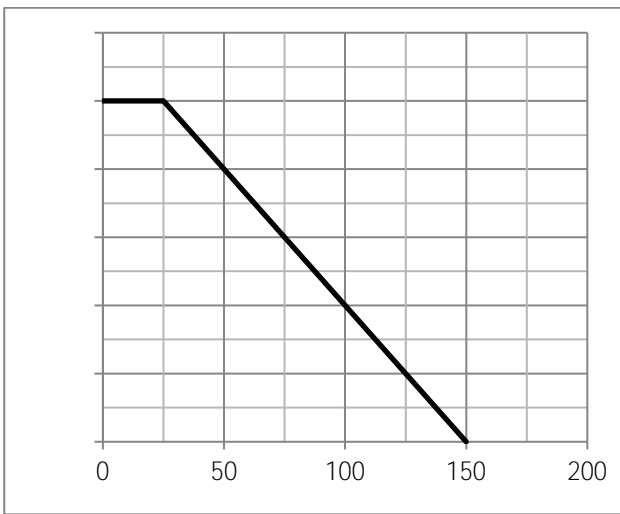


Fig.2 Typical output Characteristics

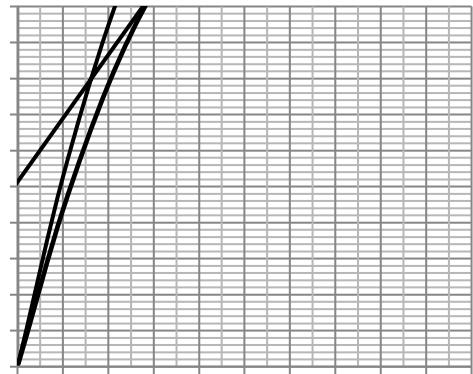


Fig.3 Threshold Voltage V.S Junction Temperature

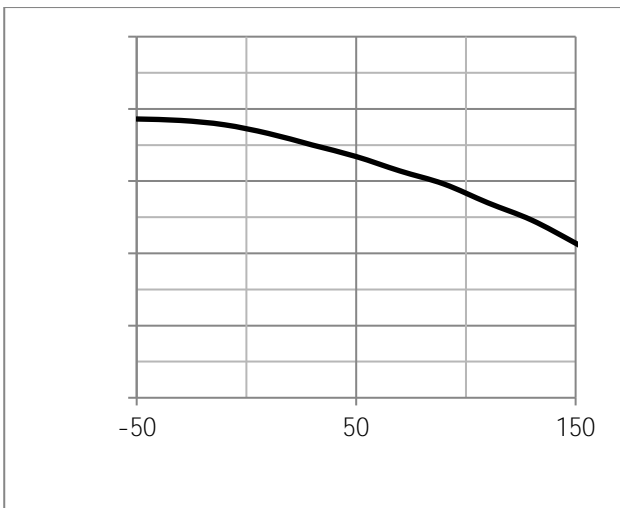
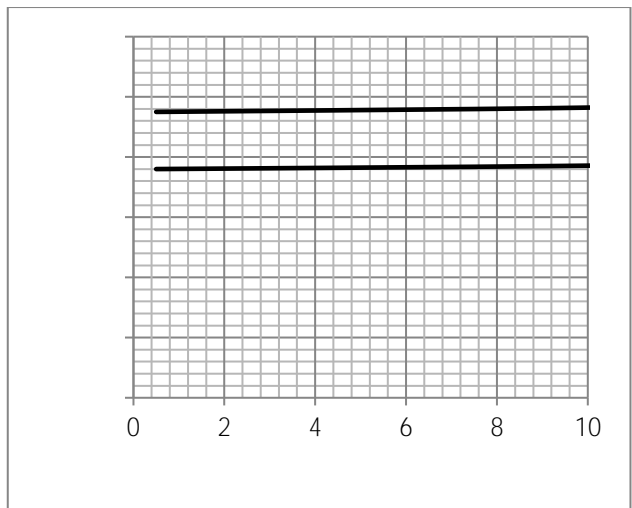


Fig.4 Resistance V.S Drain Current



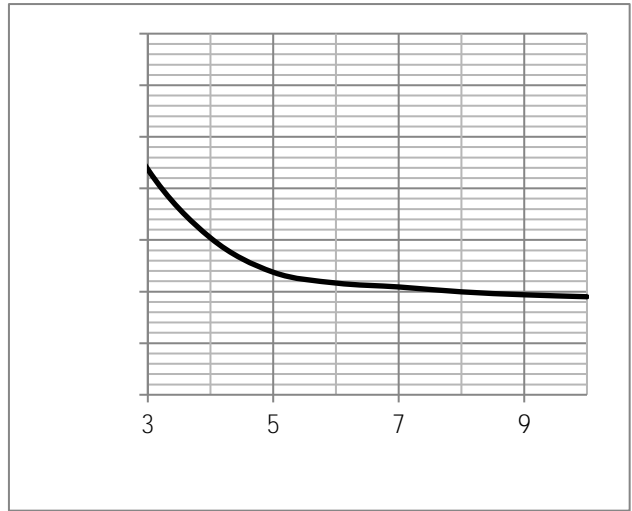
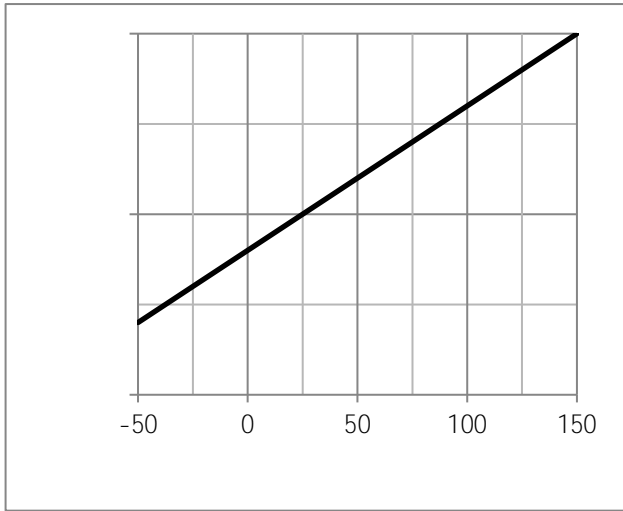
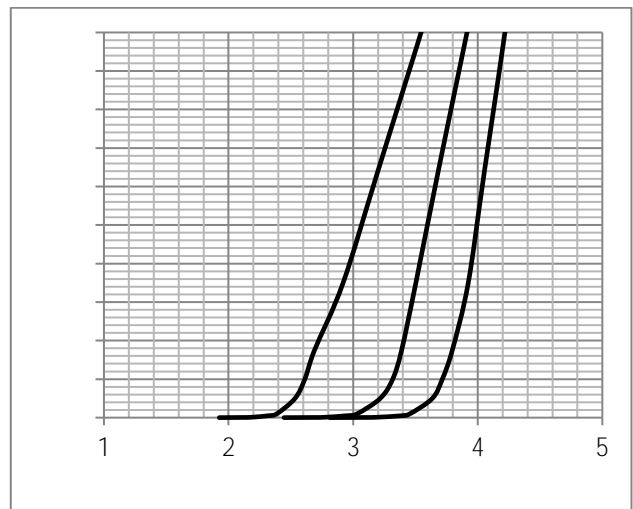
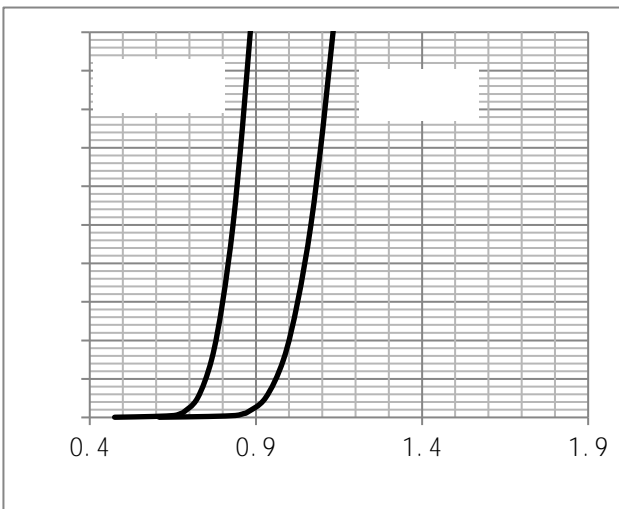
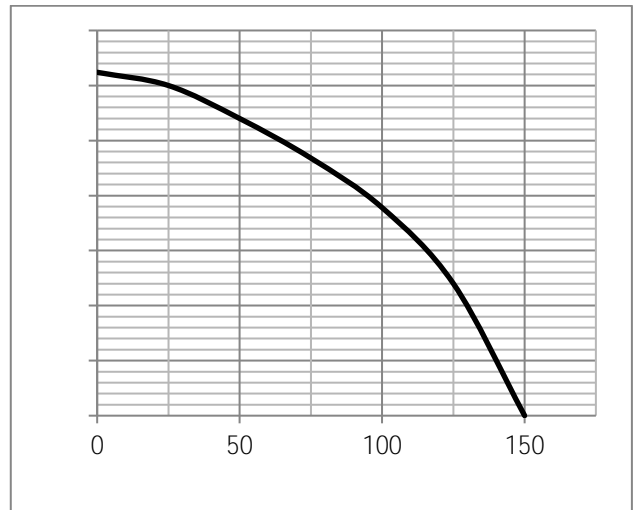
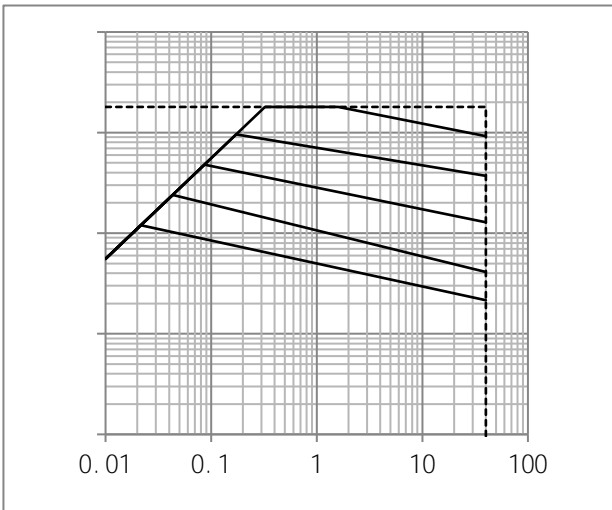


Fig.7 SOA Maximum Safe Operating Area

Fig.8 ID-Junction Temperature

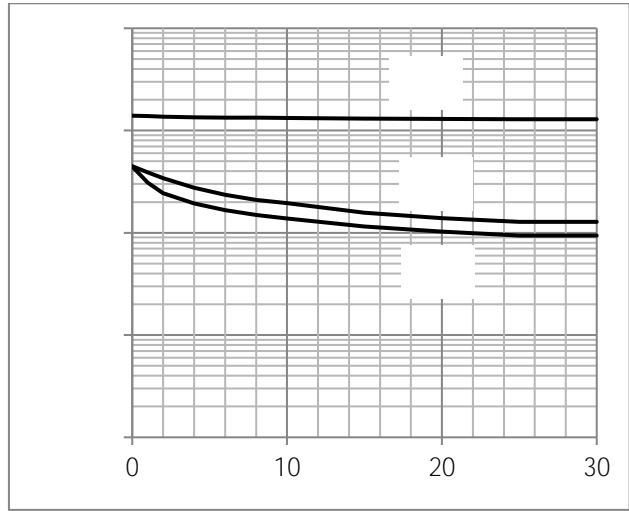
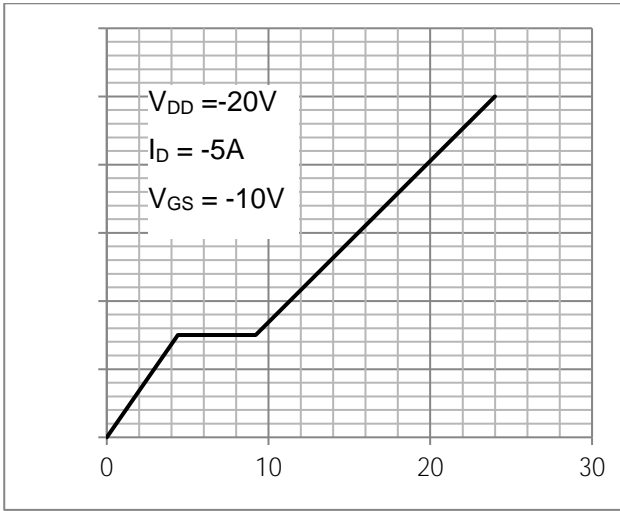




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Fig.12









Dimensions(SOP8)

Unit: mm

| SYMBOL | min  | TYP  | max  | SYMBOL | min  |      | max  |
|--------|------|------|------|--------|------|------|------|
| A      | 4.80 |      | 5.25 | C      | 1.30 |      | 1.75 |
| A1     | 0.37 |      | 0.49 | C1     | 0.55 |      | 0.75 |
| A2     |      | 1.27 |      | C2     | 0.55 |      | 0.65 |
| A3     |      | 0.41 |      | C3     | 0.05 |      | 0.20 |
| B      | 5.80 |      | 6.20 | C4     | 0.10 | 0.20 | 0.23 |
| B1     | 3.80 |      | 4.10 | D      |      | 1.05 |      |
| B2     |      | 5.00 |      | D1     | 0.40 |      | 0.62 |

