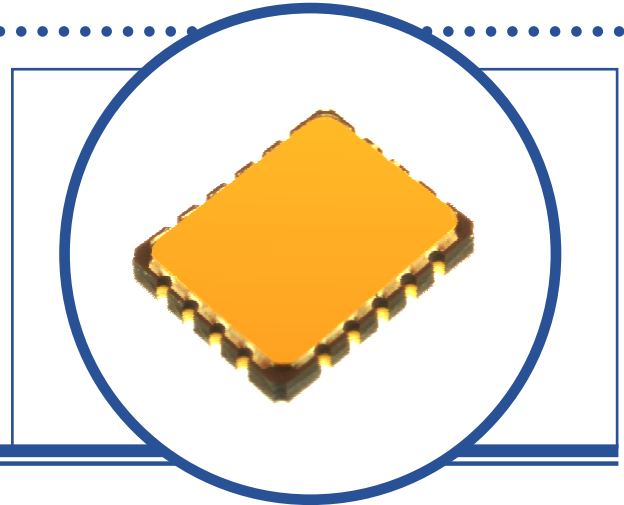


# N-CHANNEL ENHANCEMENT MODE POWER MOSFET

## 2N6660C4

- $V_{DS} = 60V$ ,  $I_D = 1.0A$ ,  $R_{DS(ON)} = 3.0\Omega$
- Fast Switching
- Low Threshold Voltage (Logic Level)
- Low  $C_{ISS}$
- Integral Source-Drain Body Diode
- Hermetic Surface Mounted Package
- High Reliability Screening Options Available



### ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ C$ unless otherwise stated)

|           |                                     |                            |               |
|-----------|-------------------------------------|----------------------------|---------------|
| $V_{DS}$  | Drain – Source Voltage              |                            | 60V           |
| $V_{GS}$  | Gate – Source Voltage               |                            | $\pm 20V$     |
| $I_D$     | Continuous Drain Current            | $T_C = 25^\circ C$         | 1.0A          |
| $I_{DM}$  | Pulsed Drain Current <sup>(1)</sup> |                            | 3.0A          |
| $P_D$     | Total Power Dissipation at          | $T_C \leq 25^\circ C$      | 5W            |
| $P_D$     | Total Power Dissipation at          | De-rate $T_C > 25^\circ C$ | 40mW/°C       |
|           |                                     | $T_A \leq 25^\circ C$      | 700mW         |
|           |                                     | De-rate $T_A > 25^\circ C$ | 5.6mW/°C      |
| $T_J$     | Operating Temperature Range         |                            | -65 to +150°C |
| $T_{stg}$ | Storage Temperature Range           |                            | -65 to +150°C |

### THERMAL PROPERTIES

| Symbols         | Parameters                              | Min. | Typ. | Max.  | Units |
|-----------------|---|------|------|-------|-------|
| $R_{\theta JC}$ | Thermal Resistance, Junction To Case    |      |      | 25    | °C/W  |
| $R_{\theta JA}$ | Thermal Resistance, Junction To Ambient |      |      | 178.5 | °C/W  |

#### Notes

- (1) Repetitive Rating: Pulse width limited by maximum junction temperature
- (2) Pulse Width  $\leq 300\mu s$ ,  $\delta \leq 2\%$

# N-CHANNEL ENHANCEMENT MODE POWER MOSFET 2N6660C4

## ELECTRICAL CHARACTERISTICS ( $T_C = 25^\circ\text{C}$ unless otherwise stated)

| Symbols            | Parameters                              | Test Conditions                                | Min. | Typ. | Max.      | Units            |
|--------------------|---|--|------|------|-----------|------------------|
| $BV_{DSS}$         | Drain-Source Breakdown Voltage          | $V_{GS} = 0$ $I_D = 1.0\mu\text{A}$            | 60   |      |           | V                |
| $V_{GS(th)}$       | Gate Threshold Voltage                  | $V_{DS} = V_{GS}$ $I_D = 1.0\text{mA}$         | 0.8  |      | 2         | V                |
|                    |   | $T_C = 125^\circ\text{C}$                      | 0.3  |      |           |                  |
|                    |   | $T_C = -55^\circ\text{C}$                      |      |      | 2.5       |                  |
| $I_{GSS}$          | Gate-Source Leakage Current             | $V_{GS} = \pm 20\text{V}$ $V_{DS} = 0\text{V}$ |      |      | $\pm 100$ | nA               |
|                    |   | $T_C = 125^\circ\text{C}$                      |      |      | $\pm 500$ |                  |
| $I_{DSS}$          | Zero Gate Voltage Drain Current         | $V_{GS} = 0$ $V_{DS} = 48\text{V}$             |      |      | 1.0       | $\mu\text{A}$    |
|                    |   | $T_C = 125^\circ\text{C}$                      |      |      | 100       |                  |
| $I_{D(ON)}^{(2)}$  | On-State Drain Current                  | $V_{DS} = 10\text{V}$ $V_{GS} = 10\text{V}$    | 1.5  |      |           | A                |
| $R_{DS(on)}^{(2)}$ | Static Drain-Source On-State Resistance | $V_{GS} = 5\text{V}$ $I_D = 0.3\text{A}$       |      |      | 5         | $\Omega$         |
|                    |   | $V_{GS} = 10\text{V}$ $I_D = 1.0\text{A}$      |      |      | 3         |                  |
|                    |   | $T_C = 125^\circ\text{C}$                      |      |      | 5         |                  |
| $g_{fs}^{(2)}$     | Forward Transconductance                | $V_{DS} = 7.5\text{V}$ $I_D = 525\text{mA}$    | 170  |      |           | $\text{m}\Omega$ |
| $V_{SD}^{(2)}$     | Body Diode Forward Voltage              | $V_{GS} = 0$ $I_S = 1.0\text{A}$               | 0.7  |      | 1.6       | V                |
| $t_{rr}^{(2)}$     | Body Diode Reverse Recovery             | $V_{GS} = 0$ $I_S = 1.0\text{A}$               |      | 350  |           | ns               |

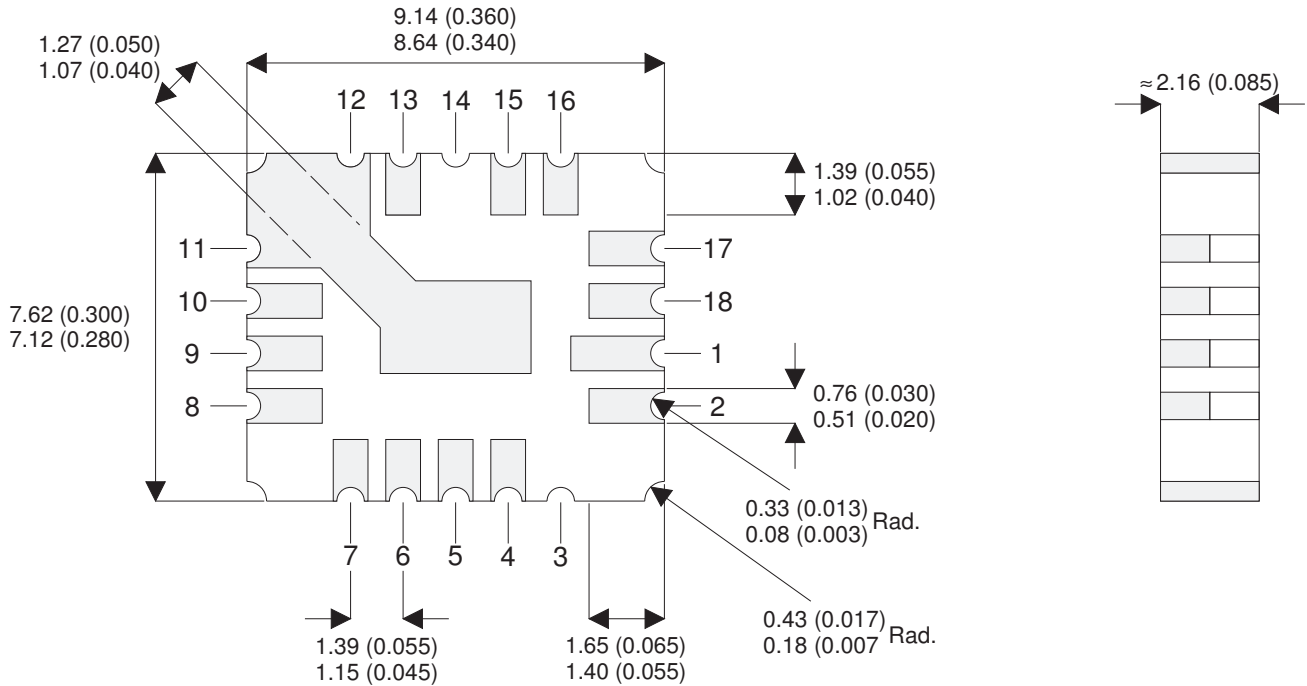
## DYNAMIC CHARACTERISTICS

|              |                              |                                      |  |  |    |    |
|--------------|------------------------------|--------------------------------------|--|--|----|----|
| $C_{iss}$    | Input Capacitance            | $V_{GS} = 0$                         |  |  | 50 | pF |
| $C_{oss}$    | Output Capacitance           | $V_{DS} = 25\text{V}$                |  |  | 40 |    |
| $C_{rss}$    | Reverse Transfer Capacitance | $f = 1.0\text{MHz}$                  |  |  | 10 |    |
| $t_{d(on)}$  | Turn-On Delay Time           | $V_{DD} = 25\text{V}$                |  |  | 10 | ns |
| $t_{d(off)}$ | Turn-Off Delay Time          | $I_D = 1.0\text{A}$ $R_G = 50\Omega$ |  |  | 10 |    |

# N-CHANNEL ENHANCEMENT MODE POWER MOSFET 2N6660C4

## MECHANICAL DATA

Dimensions in mm (inches)



**C4**  
**Underside View**

## PACKAGE VARIANT TABLE

| Variant | Pads                            | Connection    |
|---------|---------------------------------|---------------|
| A       | Pads 6, 7, 8, 9, 10, 11, 12, 13 | Source        |
|         | Pads 4, 5                       | Gate          |
|         | Pads 1, 2, 15, 16, 17, 18       | Drain         |
|         | Pads 3, 14                      | Not Connected |

# N-CHANNEL ENHANCEMENT MODE POWER MOSFET 2N6660C4

## SCREENING OPTIONS

Space Level (JQRS/ESA) and High Reliability options are available in accordance with the [High Reliability and Screening Options Handbook](#) available for download from the from the TT electronics Semelab web site.

ESA Quality Level Products are based on the testing procedures specified in the generic ESCC 5000 and in the corresponding part detail specifications.

Semelabs QR216 and QR217 processing specifications (JQRS), in conjunction with the companies ISO 9001:2000 approval present a viable alternative to the American MIL-PRF-19500 space level processing.

QR217 (Space Level Quality Conformance) is based on the quality conformance inspection requirements of MIL-PRF-19500 groups A (table V), B (table VIa), C (table VII) and also ESA / ESCC 5000 (chart F4) lot validation tests.

QR216 (Space Level Screening) is based on the screening requirements of MIL-PRF-19500 (table IV) and also ESA /ESCC 5000 (chart F3).

JQRS parts are processed to the device data sheet and screened to QR216 with conformance testing to Q217 groups A and B in accordance with MIL-STD-750 methods and procedures.

Additional conformance options are available, for example Pre-Cap Visual Inspection, Buy-Off Visit or Data Packs. These are chargeable and must be specified at the order stage (See Ordering Information). Minimum order quantities may apply.

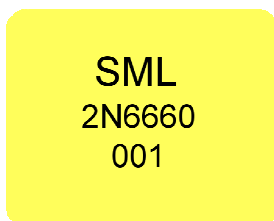
Alternative or additional customer specific conformance or screening requirements would be considered. Contact Semelab sales with enquiries.

## MARKING DETAILS

Parts are typically marked with specification number, serial number (or week of seal) as shown in the example below. .

Customer specific marking requirements can be arranged at time of order but is approximately limited to three lines of 10 Characters. This is to ensure text remains readable.

Example Marking:



## ORDERING INFORMATION

Part number is built from part, package variant and screening level. The part number can be extended to include the additional options as shown below.

Type – See Electrical Stability Characteristics Table

Package Variant – See Mechanical Data

Screening Level – See Screening Options (ESA / JQRS)

Additional Options:

|  |                   |
|--|-------------------|
| Customer Pre-Cap Visual Inspection         | .CVP              |
| Customer Buy-Off visit                     | .CVB              |
| Data Pack                                  | .DA               |
| Solderability Samples                      | .SS               |
| Scanning Electron Microscopy               | .SEM              |
| Radiography (X-ray)                        | .XRAY             |
| Total Dose Radiation Test                  | .RAD              |
| MIL-PRF-19500 (QR217)                      |                   |
| Group B charge                             | .GRPB             |
| Group B destructive mechanical samples     | .GBDM (12 pieces) |
| Group C charge                             | .GRPC             |
| Group C destructive electrical samples     | .GCDE (12 pieces) |
| Group C destructive mechanical samples     | .GCDM (6 pieces)  |
| ESA/ESCC                                   |                   |
| Lot Validation Testing (subgroup 1) charge | .LVT1             |
| LVT1 destructive samples (environmental)   | .L1DE (15 pieces) |
| LVT1 destructive samples (mechanical)      | .L1DM (15 pieces) |
| Lot Validation Testing (subgroup 2) charge | .LVT2             |
| LVT2 endurance samples (electrical)        | .L2D (15 pieces)  |
| Lot Validation Testing (subgroup 3) charge | .LVT3             |
| LVT3 destructive samples (mechanical)      | .L3D (5 pieces)   |

Additional Option Notes:

- 1) All 'Additional Options' are chargeable and must be specified at order stage.
- 2) When Group B,C or LVT is required, additional electrical and mechanical destructive samples must be ordered
- 3) All destructive samples are marked the same as other production parts unless otherwise requested.

Example ordering information:

The following example is for the 2N6660C4 part, package variant A, JQRS screening, additional Group C conformance testing and a Data pack.

Part Numbers:

2N6660C4A-JQRS (Include quantity for flight parts)  
2N6660C4A-JQRS.GRPC (chargeable conformance option)  
2N6660C4A-JQRS.GCDE (charge for destructive parts)  
2N6660C4A-JQRS.GCDM (charge for destructive parts)  
2N6660C4A-JQRS.DA (charge for Data pack)

Customers with any specific requirements (e.g. marking, package or screening) may be supplied with a similar alternative part number (there is maximum 20 character limit to part numbers). Contact Semelab sales with all enquiries