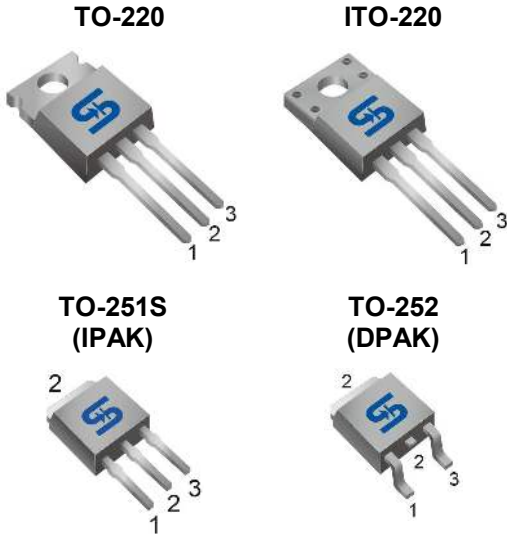


TSM340N06

60V N-Channel Power MOSFET



Pin Definition:
1. Gate
2. Drain
3. Source

Key Parameter Performance

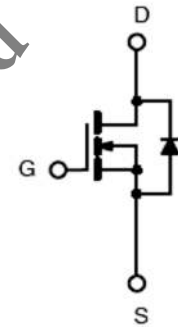
| Parameter | Value | Unit |
|--------------------|-----------------|------|
| V_{DS} | 60 | V |
| $R_{DS(on)}$ (max) | $V_{GS} = 10V$ | 34 |
| | $V_{GS} = 4.5V$ | 40 |
| Q_g | 16.6 | nC |

Ordering Information

| Part No. | Package | Packing |
|-----------------|---------|-------------------|
| TSM340N06CI C0G | ITO-220 | 50pcs / Tube |
| TSM340N06CZ C0G | TO-220 | 50pcs / Tube |
| TSM340N06CH X0G | TO-251S | 75pcs / Tube |
| TSM340N06CP ROG | TO-252 | 2.5kpcs / 13_Reel |

Note: 'G' denotes for Halogen- and Antimony-free as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds

Block Diagram



N-Channel MOSFET

Absolute Maximum Ratings (Tc = 25°C unless otherwise noted)

| Parameter | Symbol | Limit | | | Unit |
|---|-----------|-------------|---------|--------|------|
| | | IPAK/DPAK | ITO-220 | TO-220 | |
| Drain-Source Voltage | V_{DS} | 60 | | | V |
| Gate-Source Voltage | V_{GS} | ±20 | | | V |
| Continuous Drain Current (Note 1) | I_D | 30 | | | A |
| | | 19 | | | A |
| Pulsed Drain Current (Note 2) | I_{DM} | 120 | | | A |
| Single Pulse Avalanche Energy (Note 3) | E_{AS} | 24 | | | mJ |
| Single Pulse Avalanche Current (Note 2) | I_{AS} | 22 | | | A |
| Total Power Dissipation @ Tc = 25°C | P_D | 40 | 27 | 66 | W |
| Operating Junction Temperature | T_J | 150 | | | °C |
| Storage Temperature Range | T_{STG} | -55 to +150 | | | °C |

Thermal Performance

| Parameter | Symbol | Limit | | | Unit |
|--|-----------------|-----------|---------|--------|------|
| | | IPAK/DPAK | ITO-220 | TO-220 | |
| Thermal Resistance - Junction to Case | $R_{\theta JC}$ | 3.1 | 4.7 | 1.9 | °C/W |
| Thermal Resistance - Junction to Ambient | $R_{\theta JA}$ | 62 | | | °C/W |

Electrical Specifications ($T_C = 25^\circ\text{C}$ unless otherwise noted)

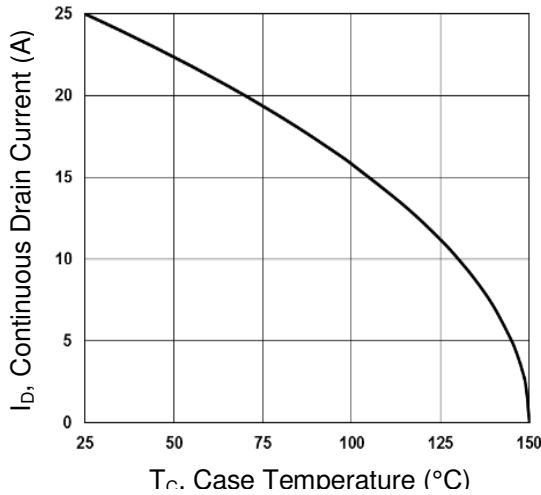
| Parameter | Conditions | Symbol | Min | Typ | Max | Unit |
|--|---|--------------|-----|------|-----------|---------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{GS} = 0\text{V}, I_D = 250\mu\text{A}$ | BV_{DSS} | 60 | -- | -- | V |
| Drain-Source On-State Resistance | $V_{GS} = 10\text{V}, I_D = 15\text{A}$ | $R_{DS(ON)}$ | -- | 28 | 34 | m Ω |
| | $V_{GS} = 4.5\text{V}, I_D = 10\text{A}$ | | -- | 33 | 40 | |
| Gate Threshold Voltage | $V_{DS} = V_{GS}, I_D = 250\mu\text{A}$ | $V_{GS(TH)}$ | 1.2 | 1.7 | 2.5 | V |
| Zero Gate Voltage Drain Current | $V_{DS} = 60\text{V}, V_{GS} = 0\text{V}$ | I_{DSS} | -- | -- | 1 | μA |
| | $V_{DS} = 48\text{V}, T_J = 125^\circ\text{C}$ | | -- | -- | 10 | |
| Gate Body Leakage | $V_{GS} = \pm 20\text{V}, V_{DS} = 0\text{V}$ | I_{GSS} | -- | -- | ± 100 | nA |
| Forward Transconductance | $V_{DS} = 10\text{V}, I_D = 8\text{A}$ | g_{fs} | -- | 8 | -- | S |
| Dynamic | | | | | | |
| Total Gate Charge (Note 4,5) | $V_{DS} = 30\text{V}, I_D = 20\text{A}, V_{GS} = 10\text{V}$ | Q_g | -- | 16.6 | -- | nC |
| Gate-Source Charge (Note 4,5) | | Q_{GS} | -- | 2.2 | -- | |
| Gate-Drain Charge (Note 4,5) | | Q_{gd} | -- | 3.9 | -- | |
| Input Capacitance | $V_{DS} = 30\text{V}, V_{GS} = 0\text{V}, f = 1\text{MHz}$ | C_{iss} | -- | 1180 | -- | pF |
| Output Capacitance | | C_{oss} | -- | 68 | -- | |
| Reverse Transfer Capacitance | | C_{rss} | -- | 45 | -- | |
| Gate Resistance | | R_g | -- | 2.1 | -- | |
| Switching | | | | | | |
| Turn-On Delay Time (Note 4,5) | $V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, R_G = 6\Omega, I_D = -1\text{A}$ | $t_{d(on)}$ | -- | 4.6 | -- | ns |
| Turn-On Rise Time (Note 4,5) | | t_r | -- | 14.8 | -- | |
| Turn-Off Delay Time (Note 4,5) | | $t_{d(off)}$ | -- | 27.2 | -- | |
| Turn-Off Fall Time (Note 4,5) | | t_f | -- | 7.8 | -- | |
| Source-Drain Diode Ratings and Characteristic | | | | | | |
| Continuous Drain-Source Diode | $V_G = V_D = 0\text{V}, \text{Force Current}$ | I_S | -- | -- | 25 | A |
| Pulse Drain-Source Diode | | I_{SM} | -- | -- | 100 | A |
| Diode-Source Forward Voltage | $V_{GS} = 0\text{V}, I_S = 1\text{A}$ | V_{SD} | -- | -- | 1 | V |
| Reverse Recovery Time (Note 4) | $V_{GS} = 0\text{V}, I_S = 1\text{A}, dI_F/dt = 100\text{A}/\mu\text{s}$ | t_{rr} | -- | 17 | -- | ns |
| Reverse Recovery Charge (Note 4) | | Q_{rr} | -- | 12 | -- | nC |

Note:

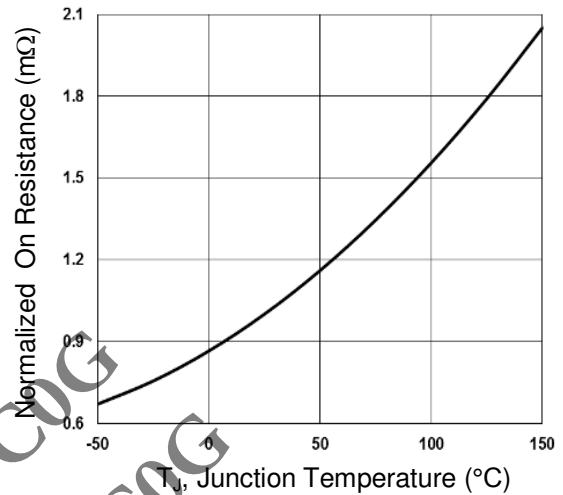
- Limited by maximum junction temperature
- Pulse width limited by safe operating area
- $L = 0.1\text{mH}, I_{AS} = 22\text{A}, V_{DD} = 50\text{V}, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
- Pulse test: pulse width $\neq 300\mu\text{s}$, duty cycle $\neq 2\%$
- Switching time is essentially independent of operating temperature.

Electrical Characteristics Curve

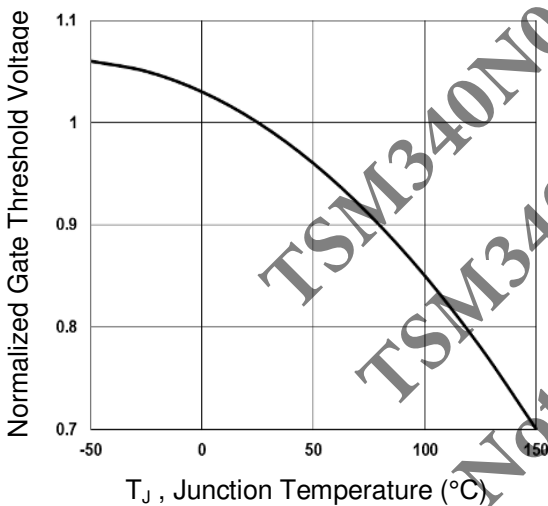
Continuous Drain Current vs. T_c



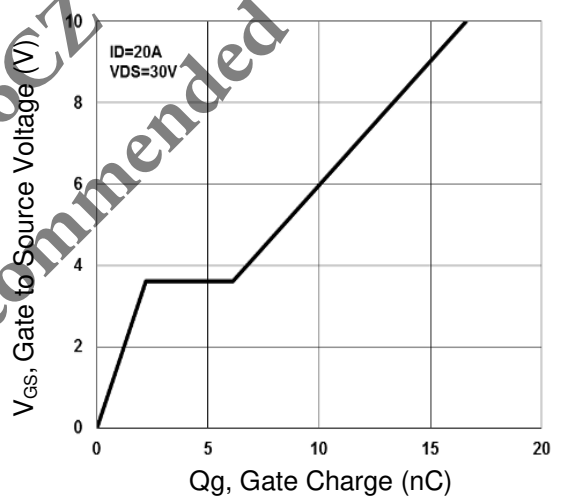
Normalized RDSON vs. T_J



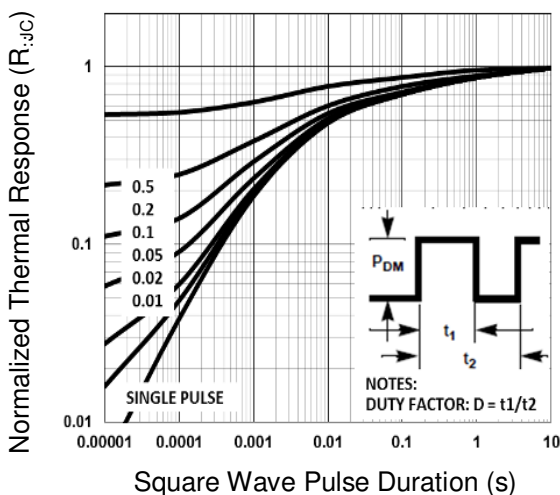
Normalized V_{th} vs. T_J



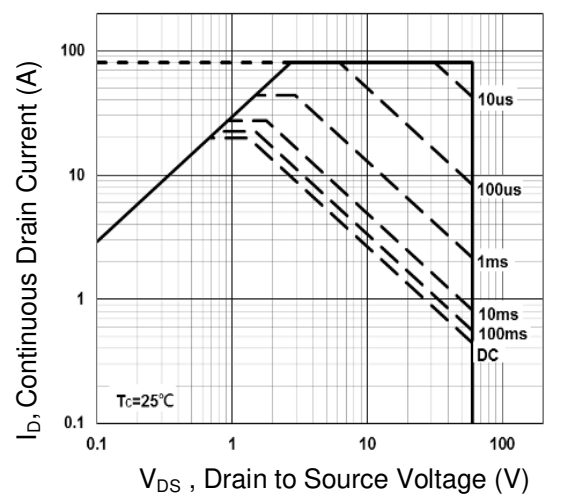
Gate Charge Waveform



Normalized Transient Impedance (ITO-220)

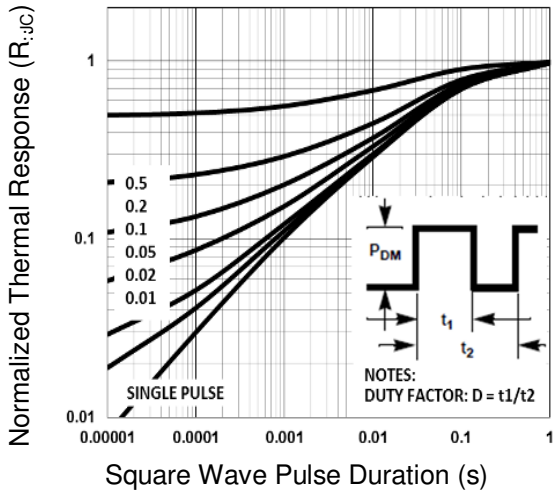


Maximum Safe Operation Area (ITO-220)

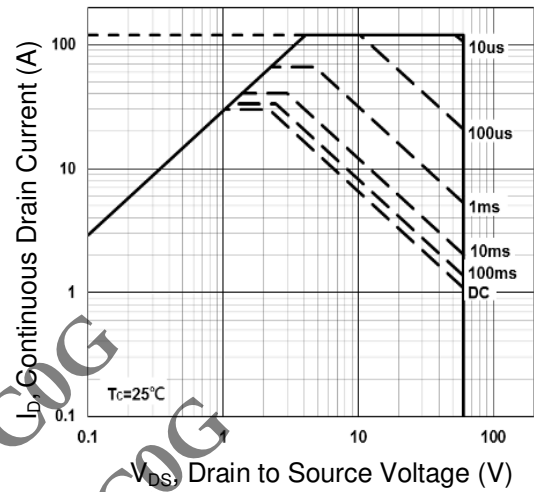


Electrical Characteristics Curve

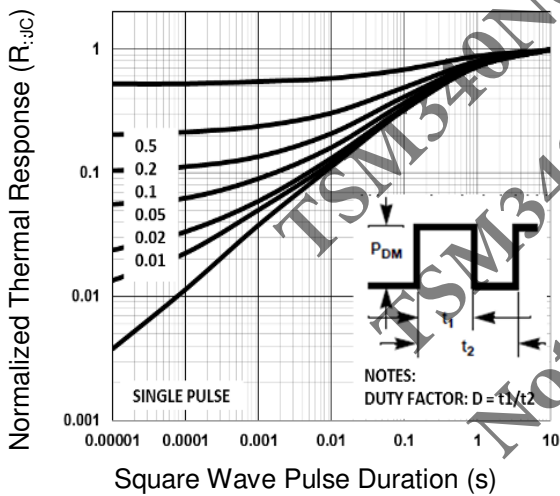
Normalized Transient Impedance (TO-220)



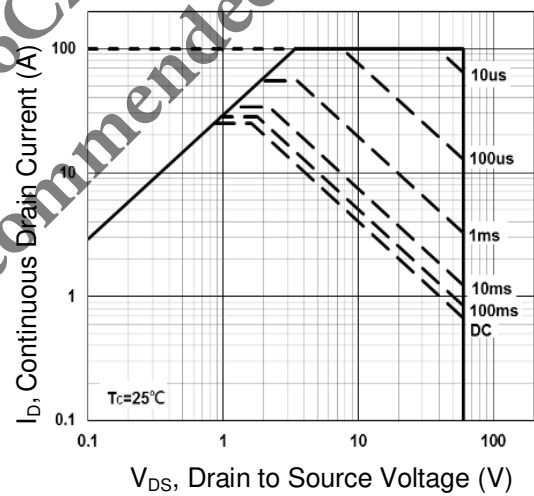
Maximum Safe Operation Area (TO-220)



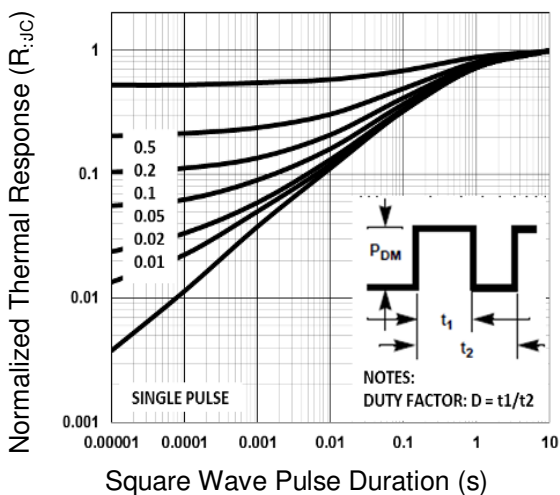
Normalized Transient Impedance (TO-251S)



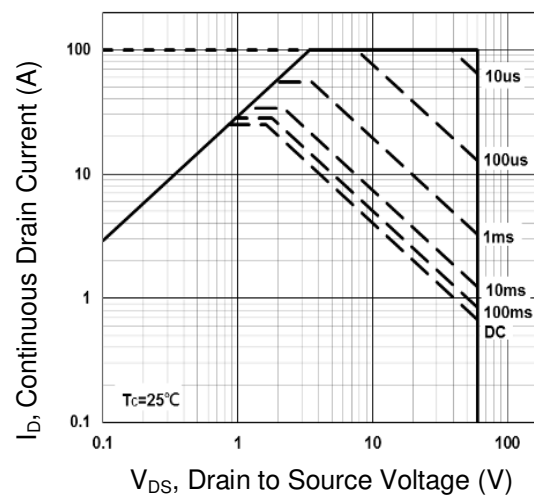
Maximum Safe Operation Area (TO-251S)



Normalized Transient Impedance (TO-252)

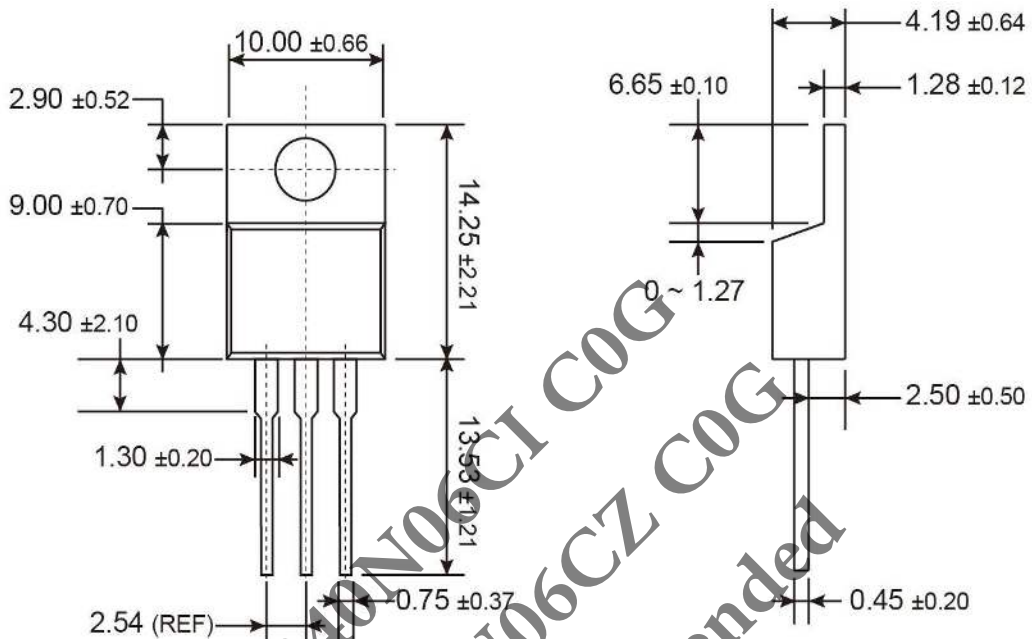


Maximum Safe Operation Area (TO-252)



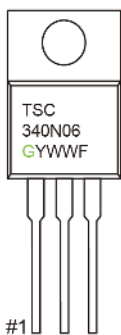


TO-220 Mechanical Drawing



Unit: Millimeters

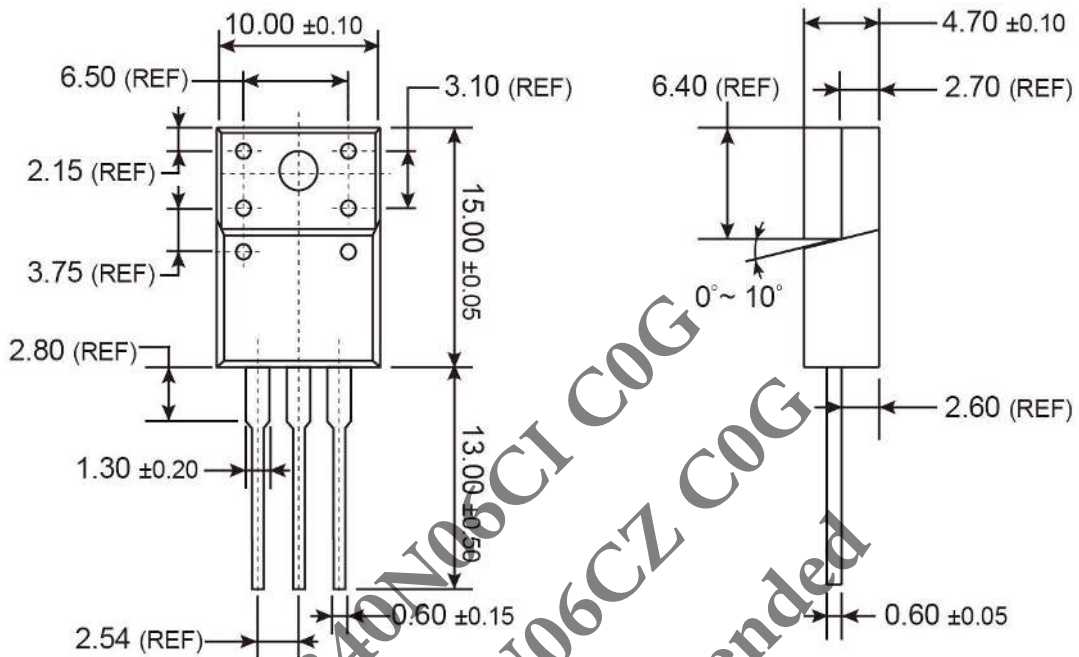
Marking Diagram



- G** = Halogen Free
- Y** = Year Code
- WW** = Week Code (01~52)
- F** = Factory Code



ITO-220 Mechanical Drawing



Unit: Millimeters

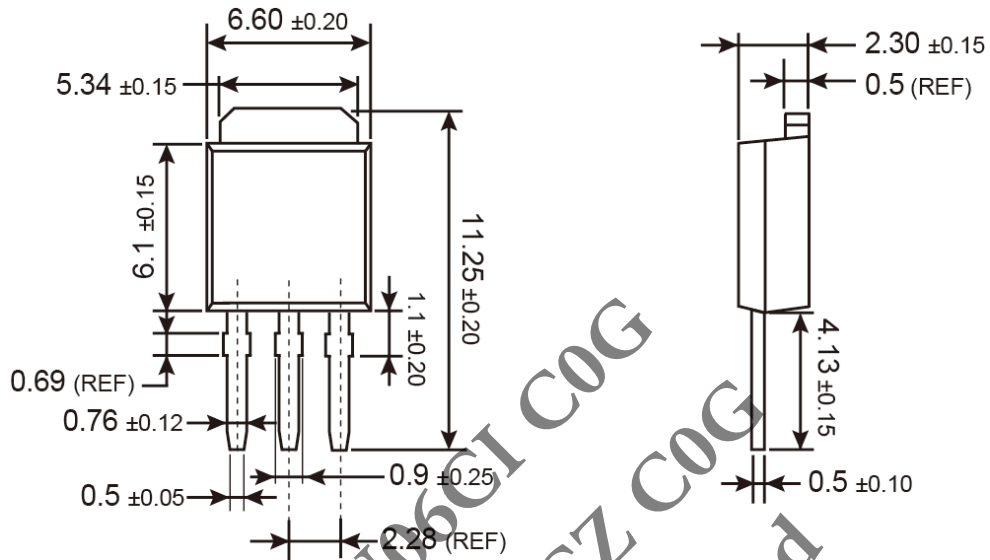
Marking Diagram



- G** = Halogen Free
- Y** = Year Code
- WW** = Week Code (01~52)
- F** = Factory Code

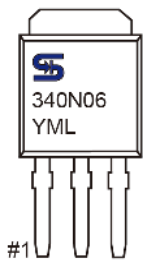


TO-251S Mechanical Drawing



Unit: Millimeters

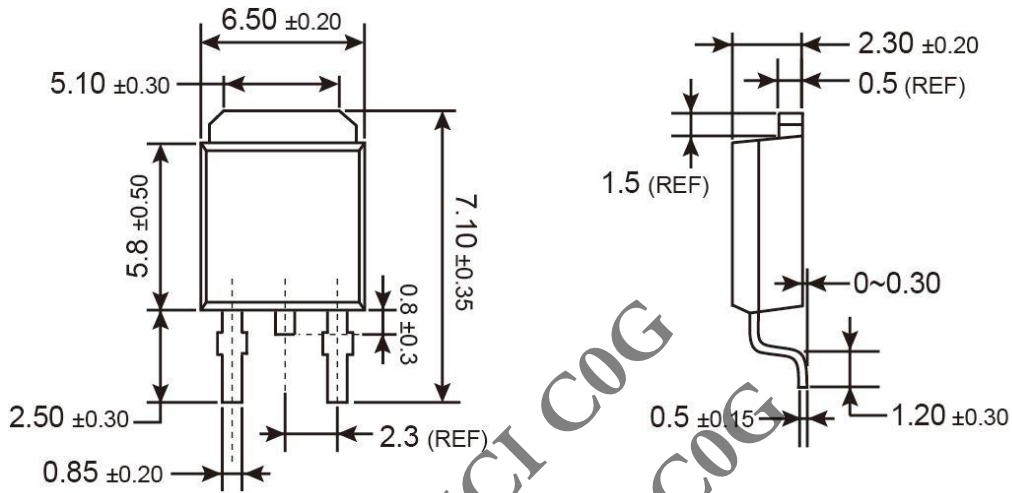
Marking Diagram



- Y** = Year Code
- M** = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
- L** = Lot Code

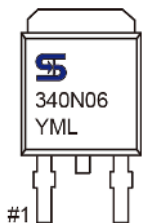


TO-252 Mechanical Drawing



Unit: Millimeters

Marking Diagram



- Y** = Year Code
- M** = Month Code for Halogen Free Product
(**O**=Jan, **P**=Feb, **Q**=Mar, **R**=Apr, **S**=May, **T**=Jun, **U**=Jul, **V**=Aug, **W**=Sep, **X**=Oct, **Y**=Nov, **Z**=Dec)
- L** = Lot Code

TSM340N06CI COG
TSM340N06CZ COG
Not Recommended

Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.