

Features

- 60V/50A,
 $R_{DS(ON)} = 9m\Omega(Typ.)@V_{GS}=10V$
 $R_{DS(ON)} = 13m\Omega(Typ.)@V_{GS}=4.5V$
- Excellent $Q_G \times R_{DS(on)}$ product(FOM)
- SGT Technology
- 100% Avalanche Tested

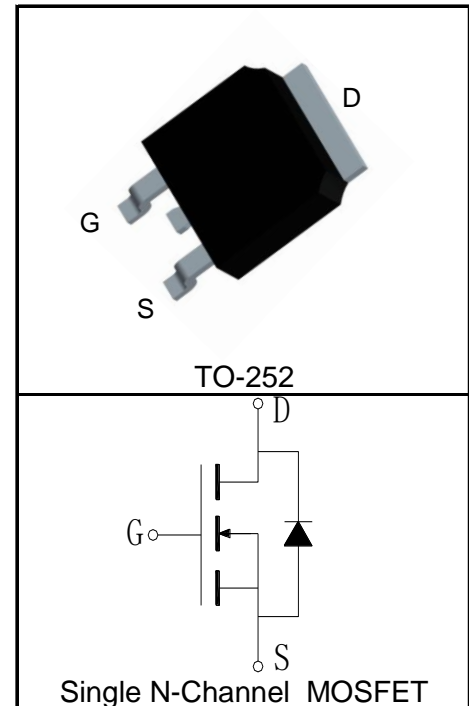
Applications

- DC-DC Converters
- Synchronous Rectification



Halogen-Free

Pin Description



Absolute Maximum Ratings

| Symbol | Parameter | Rating | Unit |
|--|--|-------------------------------|--------------------|
| Common Ratings ($T_C=25^\circ\text{C}$ Unless Otherwise Noted) | | | |
| V_{DSS} | Drain-Source Voltage | 60 | V |
| V_{GSS} | Gate-Source Voltage | ± 20 | |
| T_J | Maximum Junction Temperature | 175 | $^\circ\text{C}$ |
| T_{STG} | Storage Temperature Range | -55 to 175 | $^\circ\text{C}$ |
| I_S | Diode Continuous Forward Current | $T_C=25^\circ\text{C}$ 50 | A |
| Mounted on Large Heat Sink | | | |
| $I_{DP}^{(1)}$ | 300 μs Pulse Drain Current Tested | $T_C=25^\circ\text{C}$ 200 | A |
| $I_D^{(2)}$ | Continuous Drain Current($V_{GS}=10V$) | $T_C=25^\circ\text{C}$ 50 | A |
| | | $T_C=100^\circ\text{C}$ 35 | |
| P_D | Maximum Power Dissipation | $T_C=25^\circ\text{C}$ 50 | W |
| | | $T_C=100^\circ\text{C}$ 25 | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | 3 | $^\circ\text{C/W}$ |
| $R_{\theta JA}^{(3)}$ | Thermal Resistance-Junction to Ambient | 62.5 | $^\circ\text{C/W}$ |
| Drain-Source Avalanche Ratings | | | |
| $E_{AS}^{(4)}$ | Avalanche Energy, Single Pulsed | 30 | mJ |

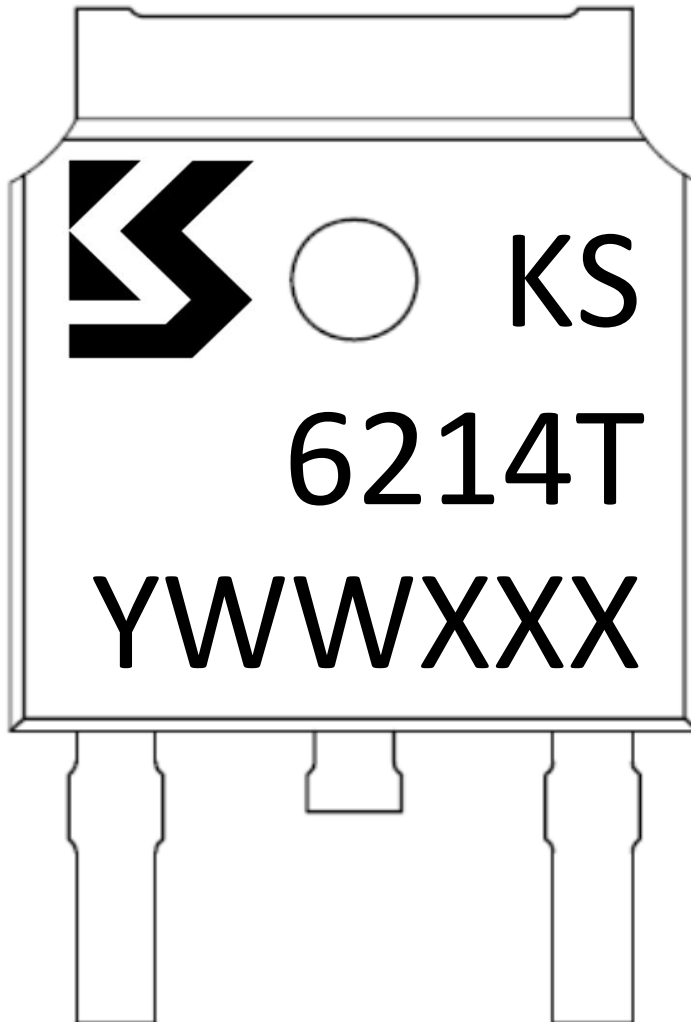
Electrical Characteristics ($T_C=25^\circ\text{C}$ Unless Otherwise Noted)

| Symbol | Parameter | Test Condition | KS6214DAT | | | Unit |
|--|----------------------------------|---|-----------|------|-----------|-----------|
| | | | Min. | Typ. | Max. | |
| Static Characteristics | | | | | | |
| BV_{DSS} | Drain-Source Breakdown Voltage | $V_{GS}=0V, I_{DS}=250\mu A$ | 60 | | | V |
| I_{DSS} | Zero Gate Voltage Drain Current | $V_{DS}=60V, V_{GS}=0V$ | | | 1 | μA |
| | | $T_J=125^\circ\text{C}$ | | | 30 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}=V_{GS}, I_{DS}=250\mu A$ | 1.1 | 1.8 | 2.3 | V |
| I_{GSS} | Gate Leakage Current | $V_{GS}=\pm 20V, V_{DS}=0V$ | | | ± 100 | nA |
| $R_{DS(ON)}^{(5)}$ | Drain-Source On-state Resistance | $V_{GS}=10V, I_{DS}=20A$ | | 9 | 13 | $m\Omega$ |
| | | $V_{GS}=4.5V, I_{DS}=16A$ | | 13 | 20 | $m\Omega$ |
| Diode Characteristics | | | | | | |
| $V_{SD}^{(5)}$ | Diode Forward Voltage | $I_{SD}=20A, V_{GS}=0V$ | | 0.88 | 1.2 | V |
| t_{rr} | Reverse Recovery Time | $I_{SD}=20A, di_{SD}/dt=100A/\mu s$ | | 36 | | ns |
| Q_{rr} | Reverse Recovery Charge | | | 58 | | nC |
| Dynamic Characteristics⁽⁶⁾ | | | | | | |
| R_G | Gate Resistance | $V_{GS}=0V, V_{DS}=0V, F=1\text{MHz}$ | | 0.9 | | Ω |
| C_{iss} | Input Capacitance | $V_{GS}=0V,$ $V_{DS}=30V,$ Frequency=1.0MHz | | 1055 | | pF |
| C_{oss} | Output Capacitance | | | 410 | | |
| C_{rss} | Reverse Transfer Capacitance | | | 20 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}=30V, I_{DS}=20A,$ $V_{GEN}=10V, R_G=3\Omega$ | | 8 | | ns |
| t_r | Turn-on Rise Time | | | 12 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 21 | | |
| t_f | Turn-off Fall Time | | | 9 | | |
| Gate Charge Characteristics⁽⁶⁾ | | | | | | |
| Q_g | Total Gate Charge | $V_{DS}=30V, V_{GS}=10V,$ $I_{DS}=20A$ | | 12 | | nC |
| Q_{gs} | Gate-Source Charge | | | 3.4 | | |
| Q_{gd} | Gate-Drain Charge | | | 3.1 | | |

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ When mounted on 1 inch square copper board, $t \leq 10\text{sec}$. The value in any given application depends on the user's specific board design.
 - ④ Limited by T_{Jmax} , $I_{AS}=11A$, $L=0.5\text{mH}$, $V_{DD}=30V$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$.
 - ⑤ Pulse test; Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 - ⑥ Guaranteed by design, not subject to production testing.

Ordering and Marking Information

| Device | Package | Packaging | Quantity | Reel Size | Tape width |
|-----------|---------|-----------|----------|-----------|------------|
| KS6214DAT | TO-252 | Tape&Reel | 2500 | 13" | 16mm |

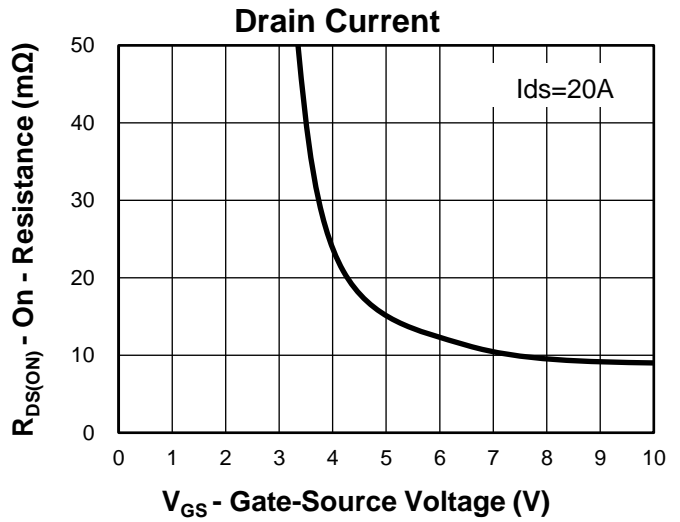
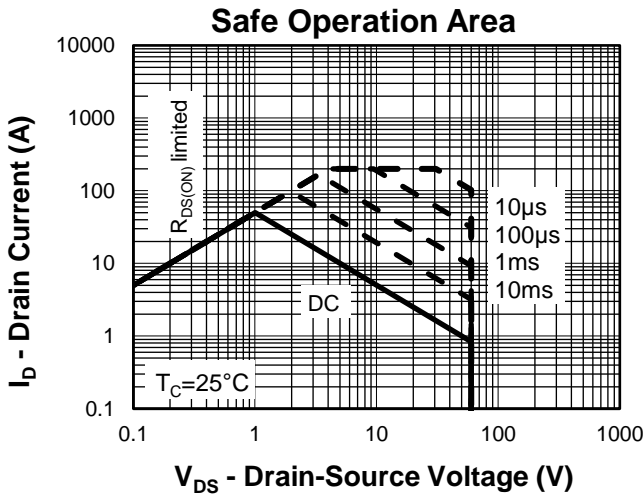
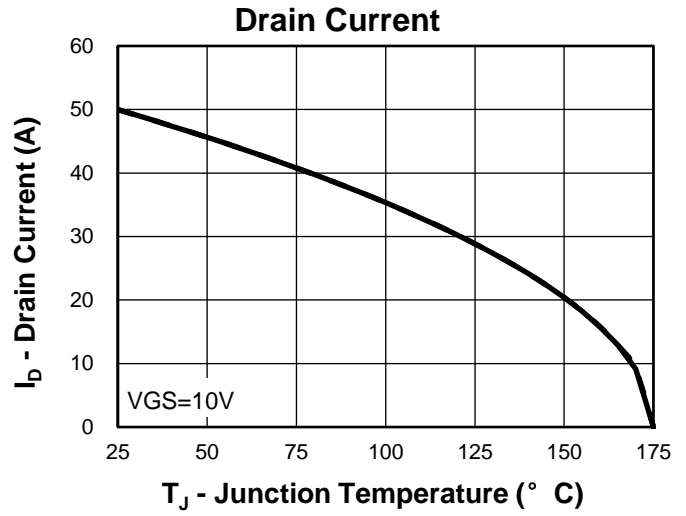
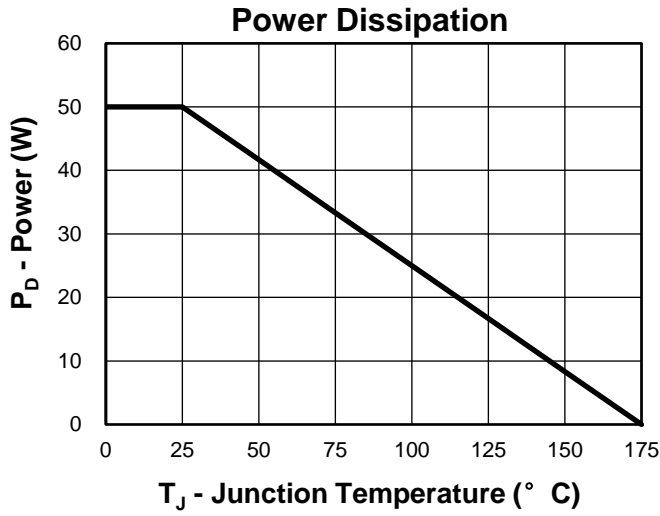


Y =Year,2017-A,2018-B,etc.

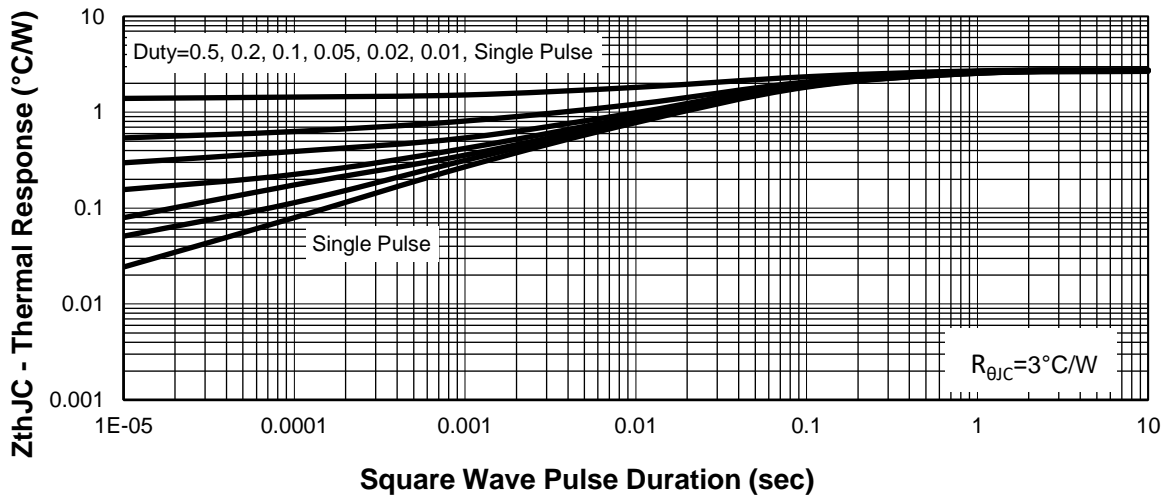
WW =Week.

XXX =Lot number.

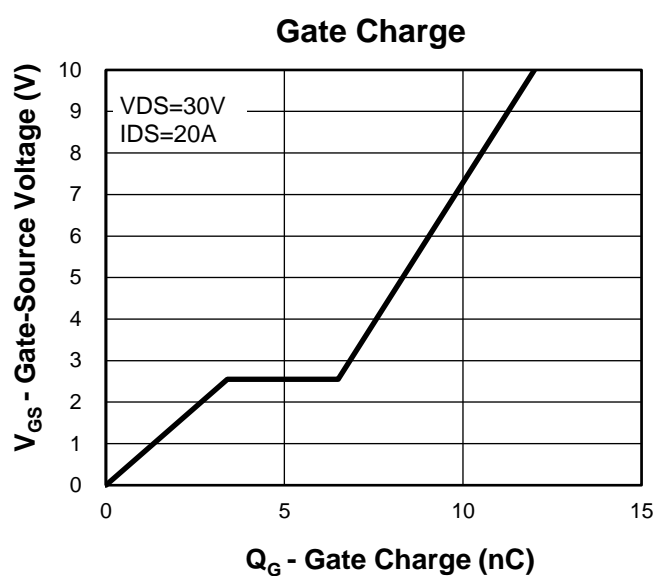
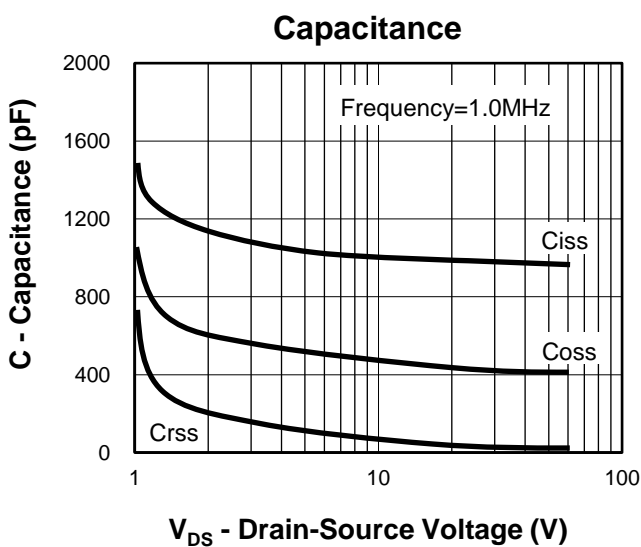
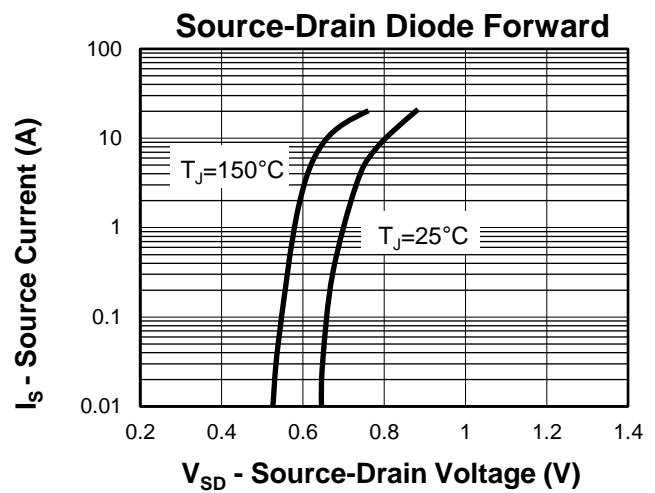
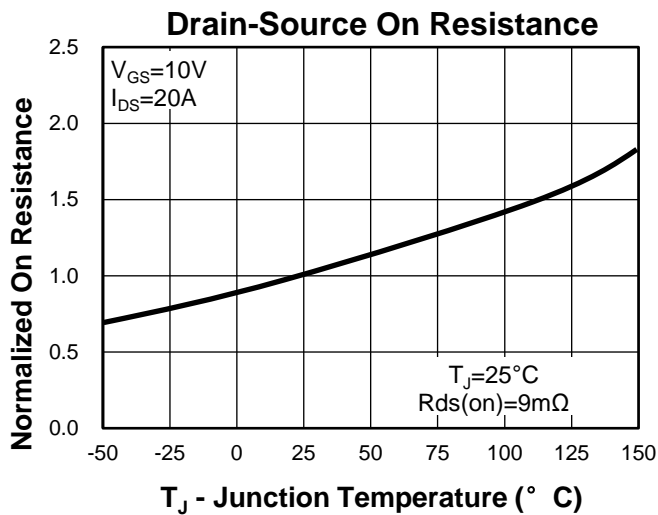
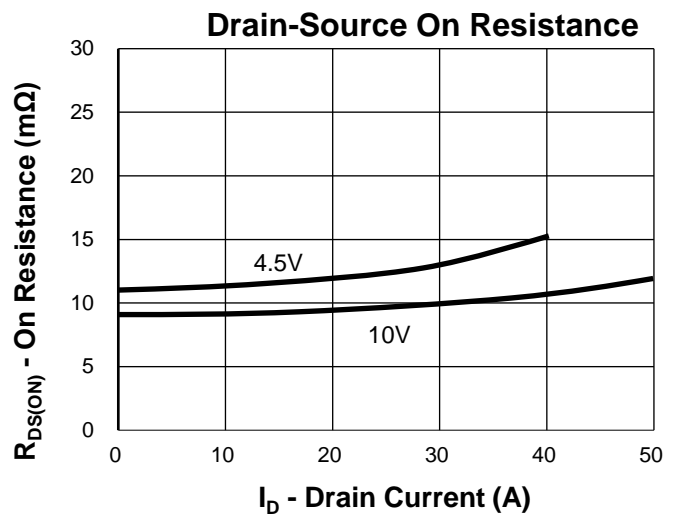
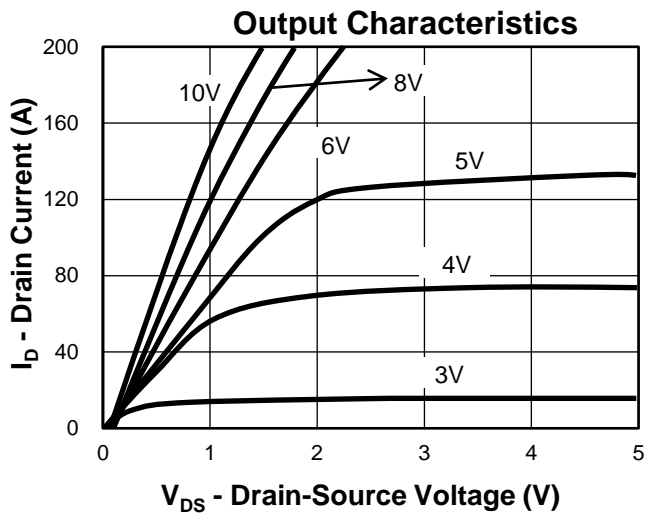
Typical Characteristics

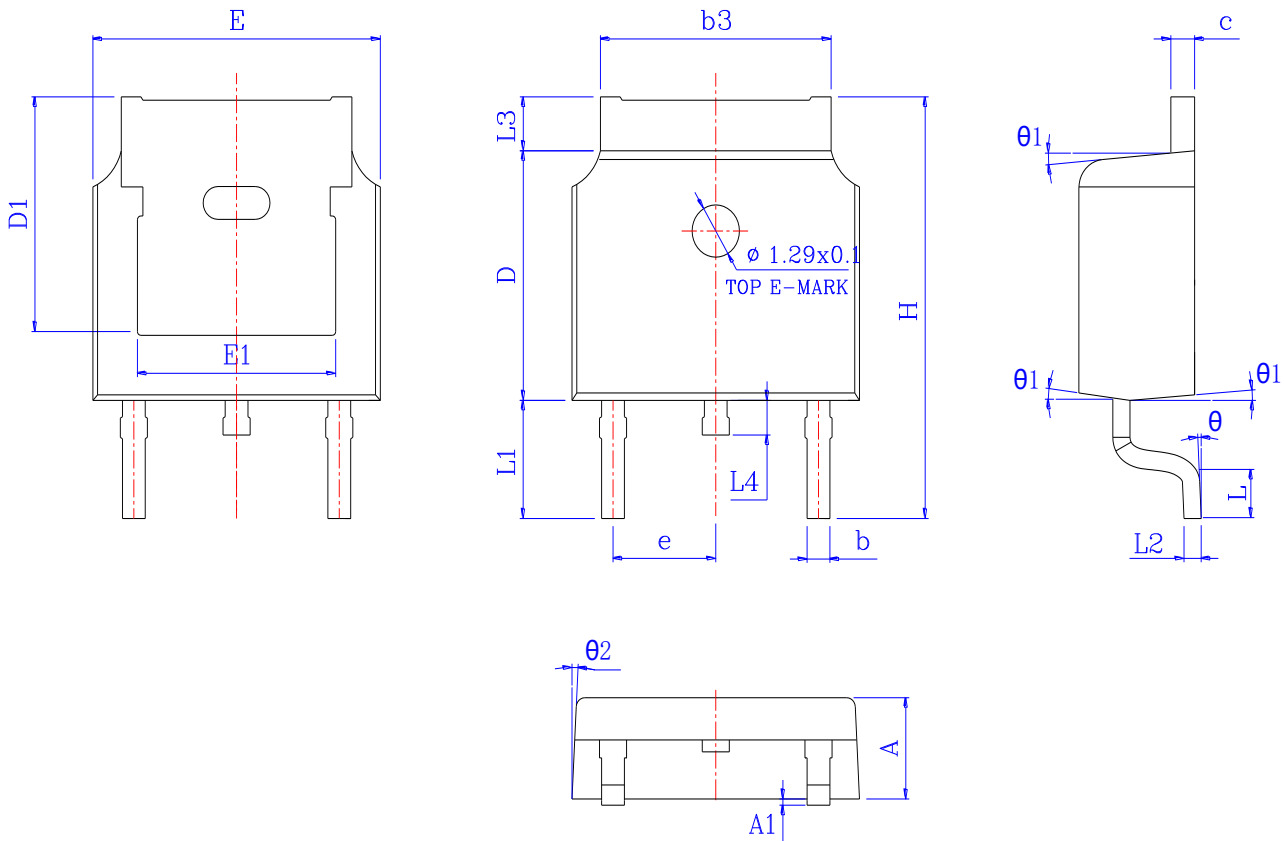


Thermal Transient Impedance



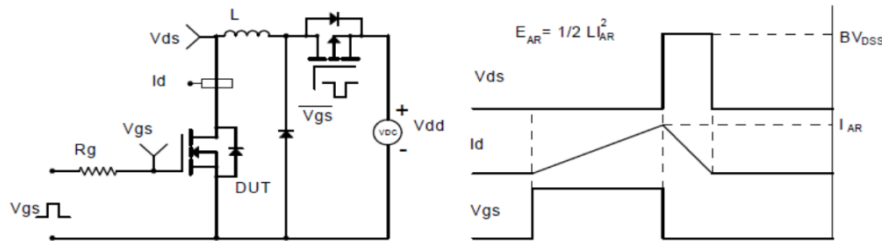
Typical Characteristics



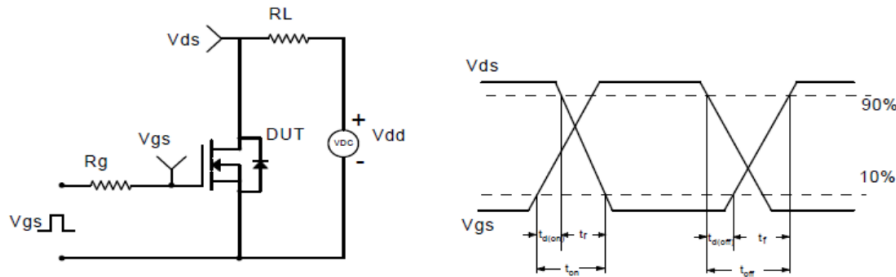
Package Information
TO-252


| SYMBOL | MM | | | INCH | | |
|------------|-----------|--------|--------|-----------|-------|-------|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 2.200 | 2.300 | 2.400 | 0.087 | 0.091 | 0.094 |
| A1 | * | * | 0.100 | * | * | 0.004 |
| b | 0.660 | 0.760 | 0.860 | 0.026 | 0.030 | 0.034 |
| b3 | 5.130 | 5.295 | 5.460 | 0.202 | 0.208 | 0.215 |
| c | 0.470 | 0.535 | 0.600 | 0.019 | 0.021 | 0.024 |
| D | 6.000 | 6.100 | 6.200 | 0.236 | 0.240 | 0.244 |
| D1 | 5.30 REF | | | 0.20 REF | | |
| E | 6.500 | 6.600 | 6.700 | 0.256 | 0.260 | 0.264 |
| E1 | 4.700 | 4.810 | 4.920 | 0.185 | 0.189 | 0.194 |
| e | 2.28 REF | | | 0.09 REF | | |
| H | 9.800 | 10.100 | 10.400 | 0.386 | 0.398 | 0.409 |
| L | 1.400 | 1.550 | 1.700 | 0.055 | 0.061 | 0.067 |
| L1 | 2.743 REF | | | 0.108 REF | | |
| L2 | 0.510 BSC | | | 0.020 BSC | | |
| L3 | 0.900 | 1.075 | 1.250 | 0.035 | 0.042 | 0.049 |
| L4 | 0.600 | 0.800 | 1.000 | 0.024 | 0.031 | 0.039 |
| θ | 0° | * | 8° | 0° | * | 8° |
| $\theta 1$ | 5° | 7° | 9° | 5° | 7° | 9° |
| $\theta 2$ | 5° | 7° | 9° | 5° | 7° | 9° |

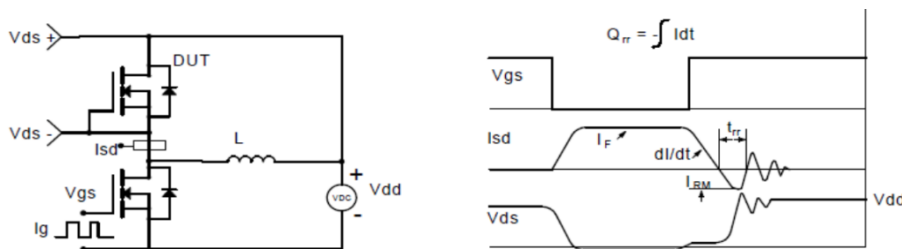
Avalanche Test Circuit and Waveforms



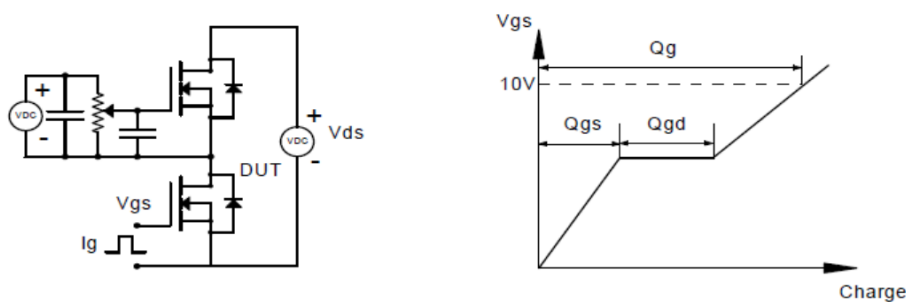
Switching Time Test Circuit and Waveforms



Diode Recovery Test Circuit and Waveforms



Gate Charge Test Circuit and Waveform



Customer Service

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