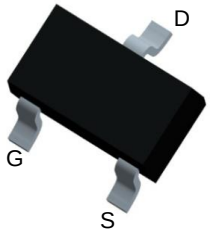
# CM4207P

## Single P-Channel Advanced Power MOSFET

## Features

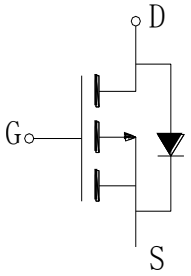
- -40V/-5A,
  $R_{DS\ (ON)}$ =30mΩ(Typ.)@$V_{GS}$=-10V
  $R_{DS\ (ON)}$ =40mΩ(Typ.)@$V_{GS}$=-4.5V
- Low $R_{DS\ (ON)}$
- Super High Dense Cell Design
- Reliable and Rugged




**SOT23-3L**

## Applications

- Load Switch




## Absolute Maximum Ratings

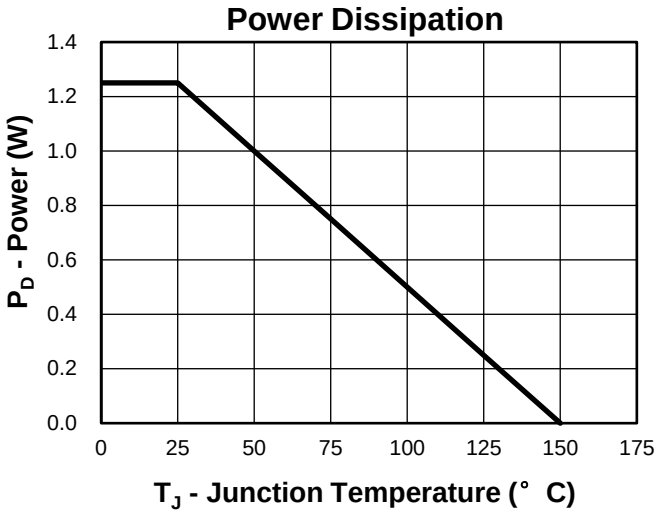
| Symbol | Parameter | | Rating | Unit |
|---|---|---|---|---|
| **Common Ratings** ($T_A$=25°C Unless Otherwise Noted) | | | | |
| $V_{DSS}$ | Drain-Source Voltage | | -40 | V |
| $V_{GSS}$ | Gate-Source Voltage | | ±20 | |
| $T_J$ | Maximum Junction Temperature | | 150 | °C |
| $T_{STG}$ | Storage Temperature Range | | -55 to 150 | °C |
| $I_S$ | Diode Continuous Forward Current | $T_A$=25°C | -1.2 | A |
| **Mounted on Large Heat Sink** | | | | |
| $I_{DP}$ ① | 300μs Pulse Drain Current Tested | $T_A$=25°C | -20 | A |
| $I_D$ ② | Continuous Drain Current($V_{GS}$=-10V) | $T_A$=25°C | -5 | A |
| | | $T_A$=70°C | -4 | |
| $P_D$ | Maximum Power Dissipation | $T_A$=25°C | 1.25 | W |
| | | $T_A$=70°C | 0.8 | |
| $R_{\theta JC}$ | Thermal Resistance-Junction to Case | | - | °C/W |
| $R_{\theta JA}$ ③ | Thermal Resistance-Junction to Ambient | | 100 | °C/W |
| **Drain-Source Avalanche Ratings** | | | | |
| $E_{AS}$ ④ | Avalanche Energy, Single Pulsed | | TBD | mJ |

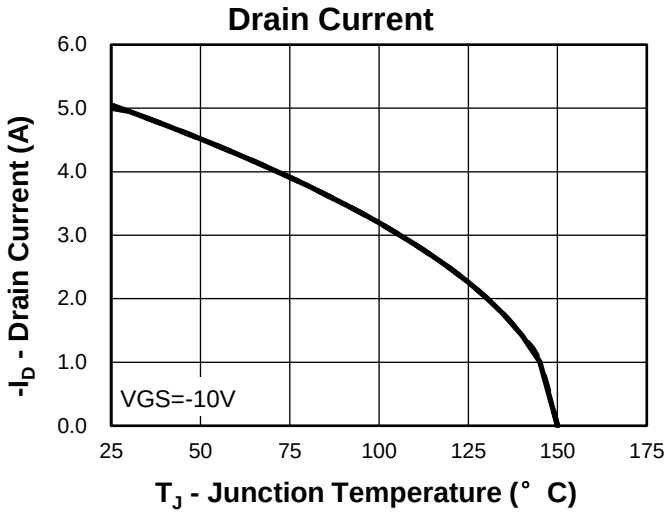
## Electrical Characteristics ($T_A$=25°C Unless Otherwise Noted)

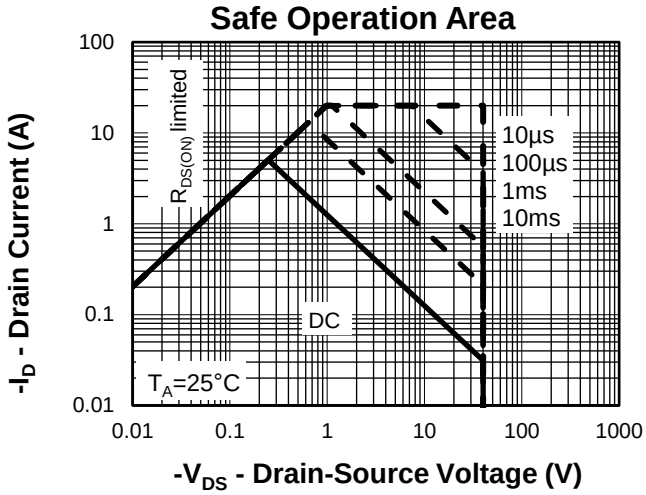
| Symbol | Parameter | Test Condition | CM4207P | | | Unit |
|---|---|---|---|---|---|---|
| | | | Min. | Typ. | Max. | |
| **Static Characteristics** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V, $I_{DS}$=-250μA | -40 | | | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-40V, $V_{GS}$=0V | | | -1 | μA |
| | | $T_J$=125°C | | | -100 | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$, $I_{DS}$=-250μA | -1.1 | -1.6 | -2.3 | V |
| $I_{GSS}$ | Gate Leakage Current | $V_{GS}$=±20V, $V_{DS}$=0V | | | ±100 | nA |
| $R_{DS(ON)}$ ⑤ | Drain-Source On-state Resistance | $V_{GS}$=-10V, $I_{DS}$=-4A | | 30 | 35 | mΩ |
| | | $V_{GS}$=-4.5V, $I_{DS}$=-3A | | 40 | 50 | mΩ |
| **Diode Characteristics** | | | | | | |
| $V_{SD}$ ⑤ | Diode Forward Voltage | $I_{SD}$=-4A, $V_{GS}$=0V | | -0.85 | -1.2 | V |
| $t_{rr}$ | Reverse Recovery Time | $I_{SD}$=-4A, $dI_{SD}/dt$=-100A/μs | | 39 | | ns |
| $Q_{rr}$ | Reverse Recovery Charge | | | 22 | | nC |
| **Dynamic Characteristics** ⑥ | | | | | | |
| $R_G$ | Gate Resistance | $V_{GS}$=0V,$V_{DS}$=0V,F=1MHz | | 6 | | Ω |
| $C_{iss}$ | Input Capacitance | $V_{GS}$=0V, $V_{DS}$=-20V, Frequency=1.0MHz | | 1415 | | pF |
| $C_{oss}$ | Output Capacitance | | | 130 | | |
| $C_{rss}$ | Reverse Transfer Capacitance | | | 100 | | |
| $t_{d(ON)}$ | Turn-on Delay Time | $V_{DD}$=-20V, $I_{DS}$=-4A, $V_{GEN}$=-10V,$R_G$=3Ω | | 8 | | ns |
| $t_r$ | Turn-on Rise Time | | | 13 | | |
| $t_{d(OFF)}$ | Turn-off Delay Time | | | 30 | | |
| $t_f$ | Turn-off Fall Time | | | 12 | | |
| **Gate Charge Characteristics** ⑥ | | | | | | |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-20V, $V_{GS}$=-10V, $I_{DS}$=-4A | | 11 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 3.7 | | |
| $Q_{gd}$ | Gate-Drain Charge | | | 3.2 | | |

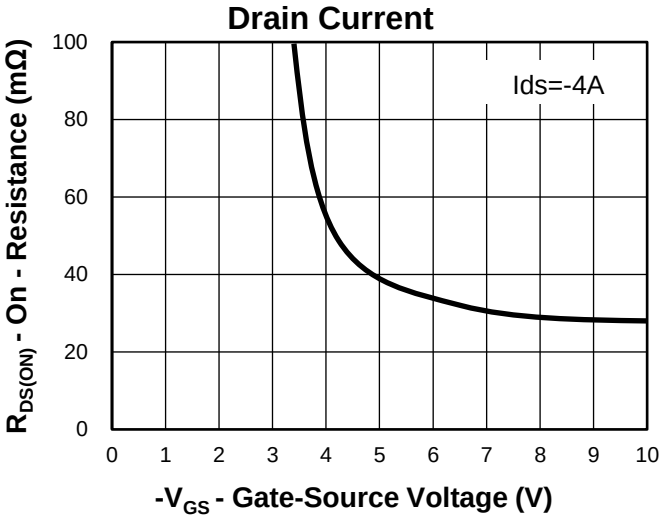
Notes:
①Pulse width limited by safe operating area.
②Calculated continuous current based on maximum allowable junction temperature.
③When mounted on 1 inch square copper board, t≤10sec. The value in any given application depends on the user's specific board design.
④Limited by $T_{Jmax}$ , Starting $T_J$ = 25°C.
⑤Pulse test;Pulse width≤300μs, duty cycle≤2%.
⑥Guaranteed by design, not subject to production testing.

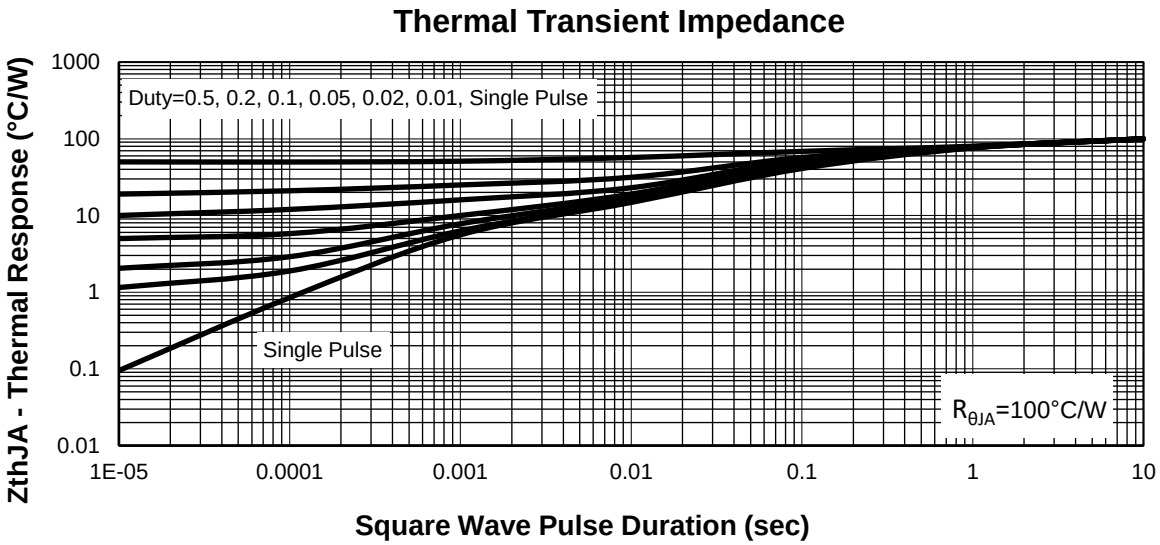
## Typical Characteristics



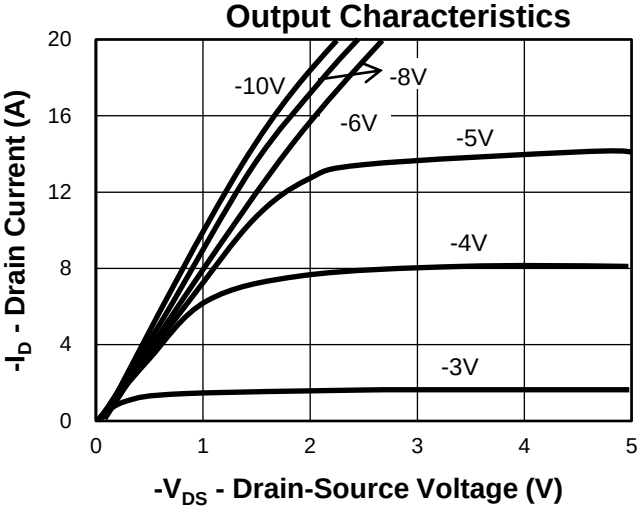



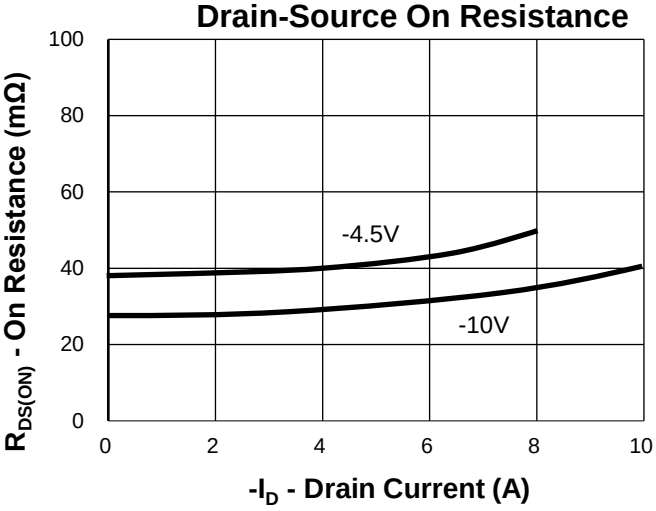



## Typical Characteristics

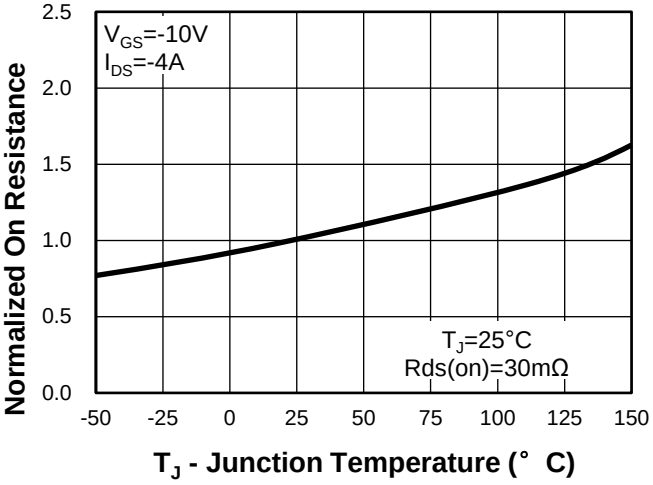
### Output Characteristics



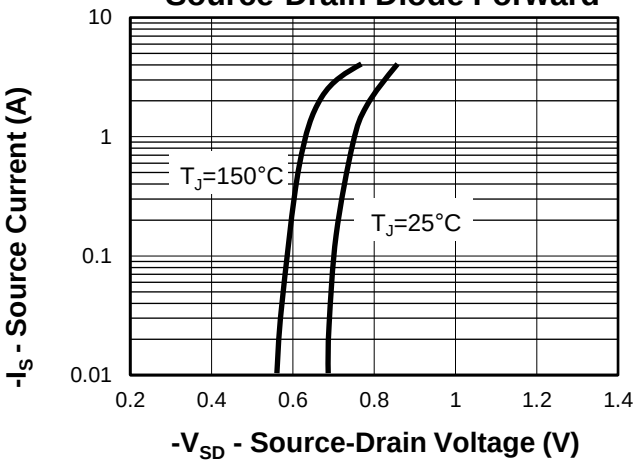

### Drain-Source On Resistance



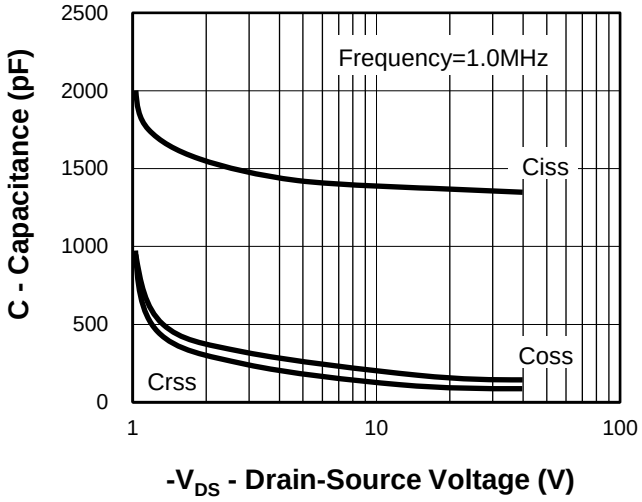

### Drain-Source On Resistance



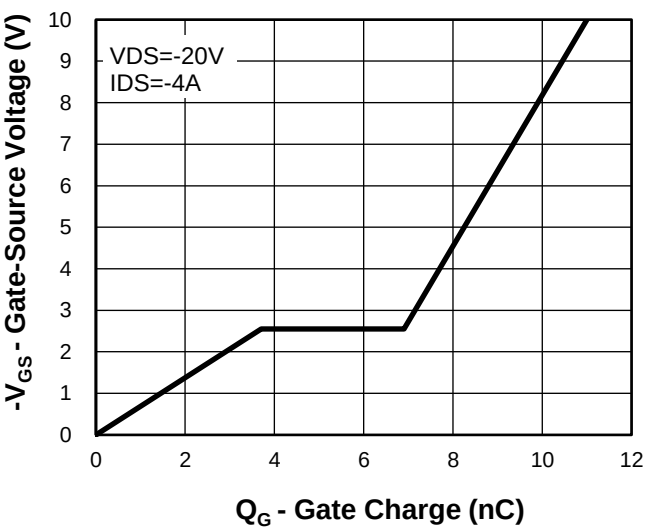

### Source-Drain Diode Forward




### Capacitance

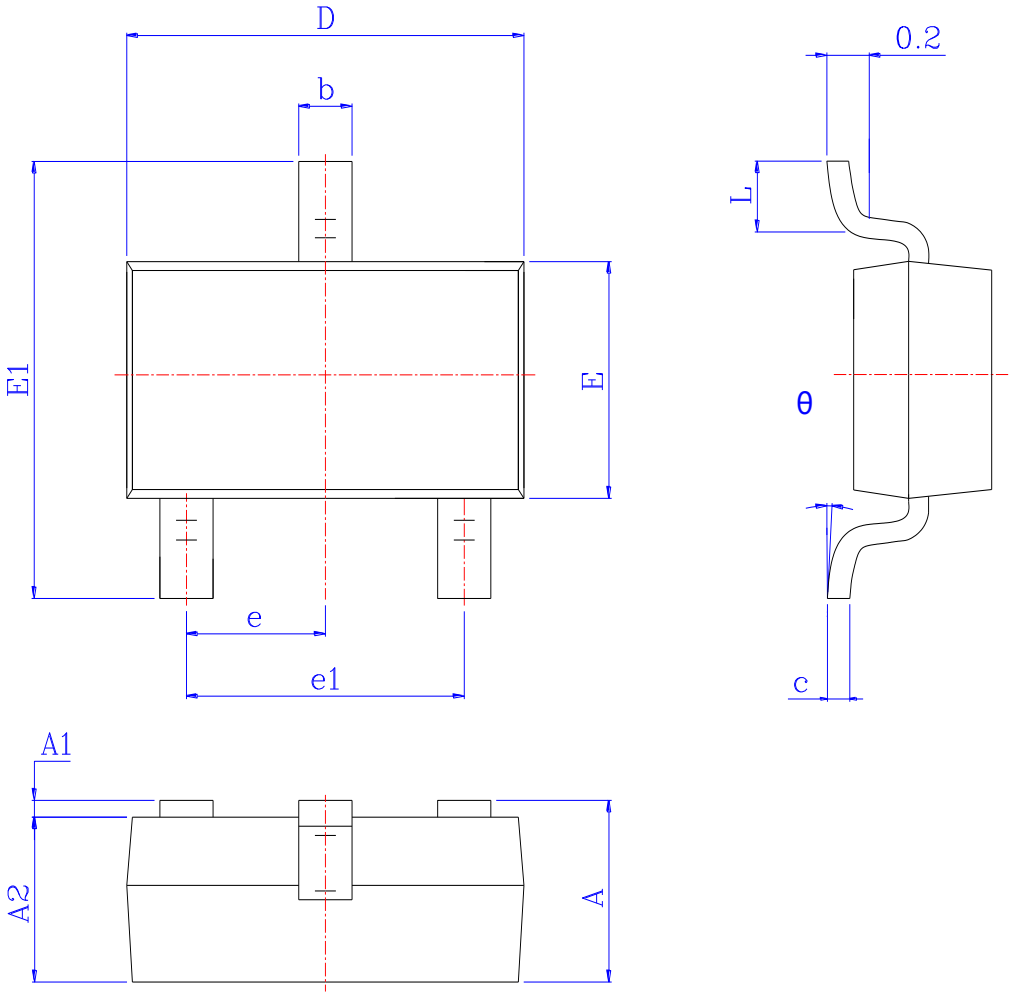



### Gate Charge



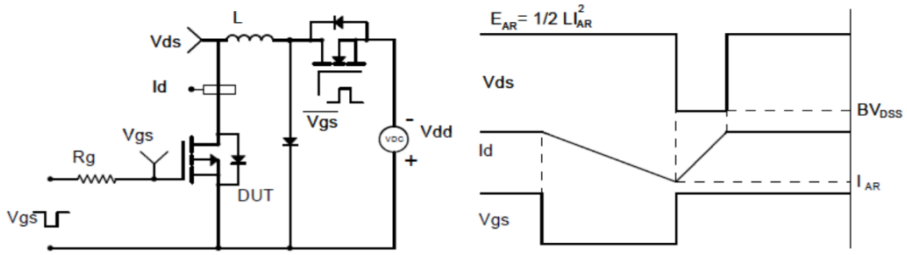
## Package Information

# SOT23-3L

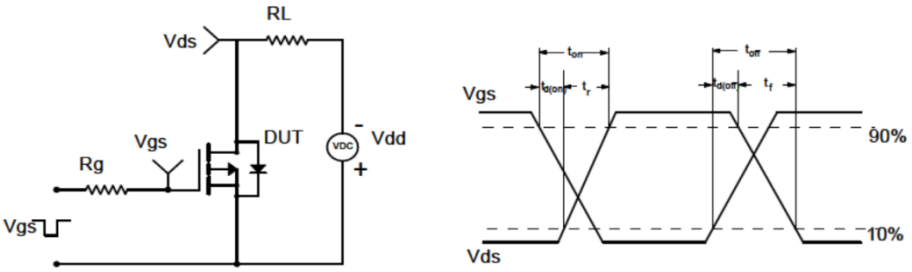



| SYMBOL | MM | | | INCH | | |
|---|---|---|---|---|---|---|
| | MIN | NOM | MAX | MIN | NOM | MAX |
| A | 0.950 | 1.150 | 1.450 | 0.037 | 0.045 | 0.057 |
| A1 | 0.000 | * | 0.150 | 0.000 | * | 0.006 |
| A2 | 0.900 | 1.100 | 1.300 | 0.035 | 0.043 | 0.051 |
| b | 0.300 | 0.400 | 0.500 | 0.012 | 0.016 | 0.020 |
| c | 0.080 | 0.150 | 0.200 | 0.003 | 0.006 | 0.008 |
| D | 2.800 | 2.925 | 3.050 | 0.110 | 0.115 | 0.120 |
| E | 1.500 | 1.600 | 1.750 | 0.059 | 0.063 | 0.069 |
| E1 | 2.650 | 2.800 | 3.000 | 0.104 | 0.110 | 0.118 |
| e | 0.950 BSC | | | 0.037 BSC | | |
| e1 | 1.800 | 1.900 | 2.000 | 0.071 | 0.075 | 0.079 |
| L | 0.300 | 0.450 | 0.600 | 0.012 | 0.018 | 0.024 |
| θ | 0° | 4° | 8° | 0° | 4° | 8° |

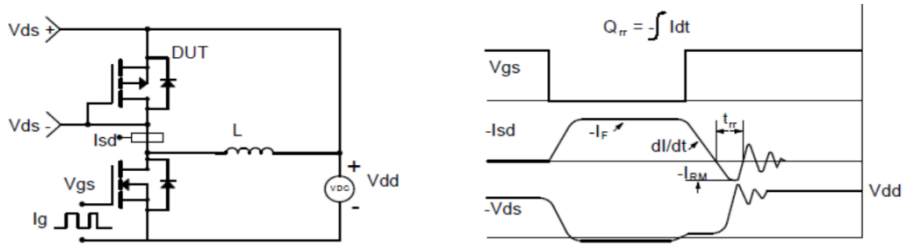
## Avalanche Test Circuit and Waveforms




## Switching Time Test Circuit and Waveforms




## Diode Recovery Test Circuit and Waveforms




## Gate Charge Test Circuit and Waveform