# CST415 P-Ch 15V Fast Switching MOSFETs

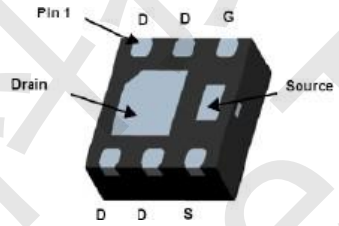
- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

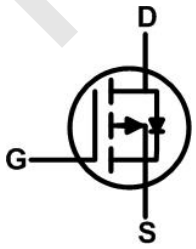
## CST415 Product Summary

Green

| BVDSS | RDSON | ID |
|---|---|---|
| -15V | 24mΩ | - 7 A |

## CST415 DFN2020-6L Pin Configuration




## CST415 Description

The CST415 is the high cell density trenched P-ch MOSFETs, which provide excellent RDSON and gate charge for most of the synchronous buck converter applications.

The CST415 meet the RoHS and Green Product requirement, 100% EAS guaranteed with full function reliability approved.

## CST415 Absolute Maximum Ratings (TA=25℃unless otherwise noted)

| Parameter | Symbol | Limit | Unit |
|---|---|---|---|
| Drain-Source Voltage | $V_{DS}$ | -16 | V |
| Gate-Source Voltage | $V_{GS}$ | ±12 | V |
| Drain Current -Continuous | $I_D$ | -7.0 | A |
| Drain Current -Pulsed (Note 1) | $I_{DM}$ | -15 | A |
| Maximum Power Dissipation | $P_D$ | 2.5 | W |
| Operating Junction and Storage Temperature Range | $T_J, T_{STG}$ | -55 To 150 | ℃ |

## CST415 Thermal Characteristic

| | | | |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{\theta JA}$ | 74 | ℃/W |



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# CST415 P-Ch 15V Fast Switching MOSFETs

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Zero Gate Voltage Drain Current | $I_{DSS}$ | $V_{DS}$=-16V,$V_{GS}$=0V | - | - | -1 | μA |
| Gate-Body Leakage Current | $I_{GSS}$ | $V_{GS}$=±12V,$V_{DS}$=0V | - | - | ±100 | nA |
| **On Characteristics** (Note 3) | | | | | | |
| Drain-Source Breakdown Voltage | $BV_{DSS}$ | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -15 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS}$=$V_{GS}$,$I_D$=-250μA | -0.45 | -0.7 | -1.0 | V |
| Drain-Source On-State Resistance | $R_{DS(ON)}$ | $V_{GS}$=-4.5V, $I_D$=-4.1A | - | 24 | 45 | mΩ |
| | | $V_{GS}$=-2.5V, $I_D$=-3A | - | 40 | 60 | |
| Forward Transconductance | $g_{FS}$ | $V_{DS}$=-5V,$I_D$=-4.1A | 5 | - | - | S |
| **Dynamic Characteristics** (Note4) | | | | | | |
| Input Capacitance | $C_{lss}$ | $V_{DS}$=-4V,$V_{GS}$=0V, F=1.0MHz | - | 740 | - | PF |
| Output Capacitance | $C_{oss}$ | | - | 290 | - | PF |
| Reverse Transfer Capacitance | $C_{rss}$ | | - | 190 | - | PF |
| **Switching Characteristics** (Note 4) | | | | | | |
| Turn-on Delay Time | $t_{d(on)}$ | $V_{DD}$=-4V,$I_D$=-4.1A , $R_L$=-1.2Ω,$V_{GEN}$=-4.5V,$R_g$=1Ω | - | 12 | - | nS |
| Turn-on Rise Time | $t_r$ | | - | 35 | - | nS |
| Turn-Off Delay Time | $t_{d(off)}$ | | - | 30 | - | nS |
| Turn-Off Fall Time | $t_f$ | | - | 10 | - | nS |
| Total Gate Charge | $Q_g$ | $V_{DS}$=-4V,$I_D$=-4.1A,$V_{GS}$=-4.5V | - | 7.8 | - | nC |
| Gate-Source Charge | $Q_{gs}$ | | - | 1.2 | - | nC |
| Gate-Drain Charge | $Q_{gd}$ | | - | 1.6 | - | nC |
| **Drain-Source Diode Characteristics** | | | | | | |
| Diode Forward Voltage (Note 3) | $V_{SD}$ | $V_{GS}$=0V,$I_S$=-4.1A | - | - | -1.2 | V |
| Diode Forward Current (Note 2) | $I_S$ | | - | - | -7.1 | A |

## Notes:

**1.** Repetitive Rating: Pulse width limited by maximum junction temperature.
**2.** Surface Mounted on FR4 Board, t ≤ 10 sec.
**3.** Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
**4.** Guaranteed by design, not subject to production



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## CST415 Typical Electrical and Thermal Characteristics

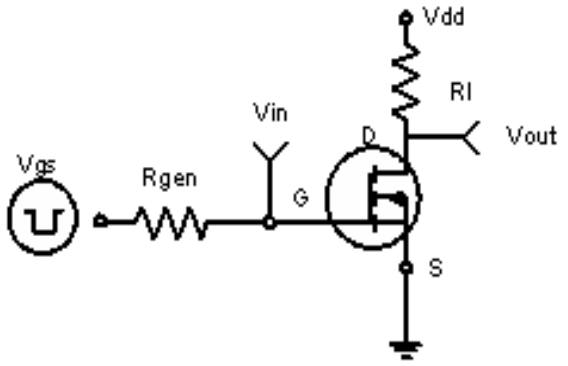



**Figure 1:Switching Test Circuit**

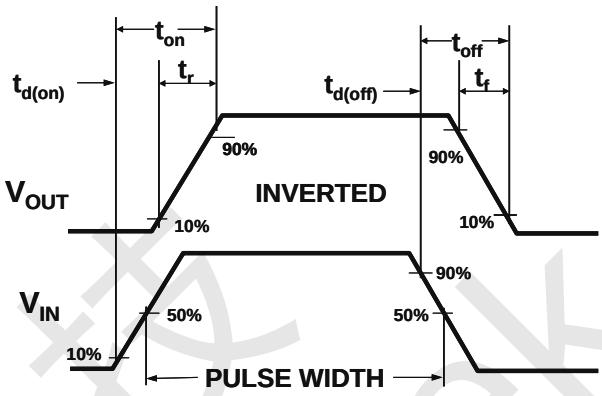
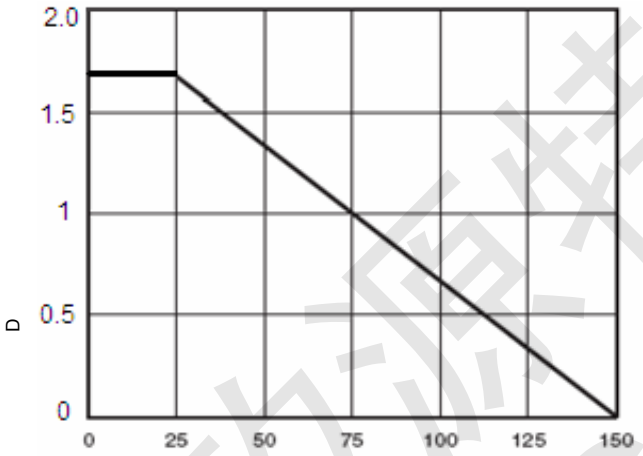
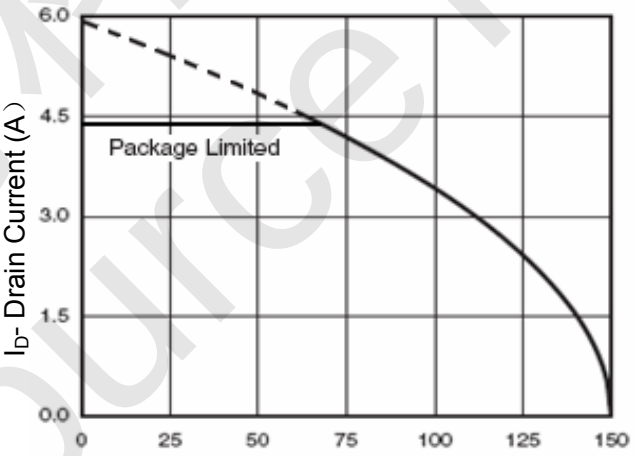



**Figure 2:Switching Waveforms**



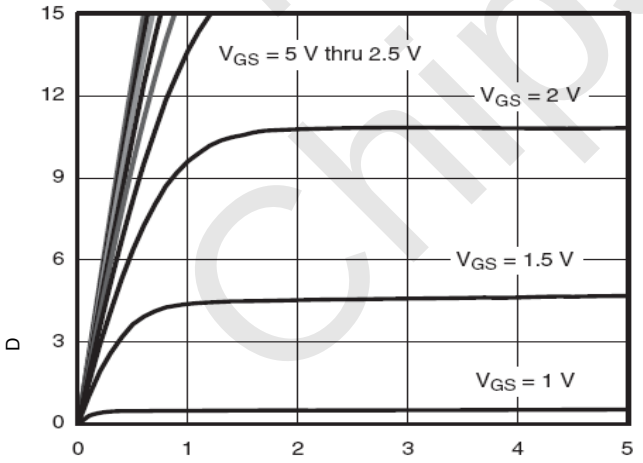

TJ-Junction Temperature(℃)

**Figure 3 Power Dissipation**



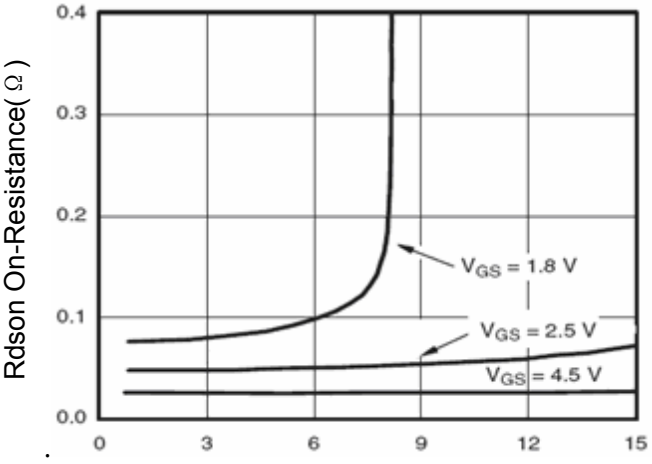

TJ-Junction Temperature(℃)

**Figure 4 Drain Current**




Vds Drain-Source Voltage (V)

**Figure 5 Output Characteristics**




ID- Drain Current (A)

**Figure 6 Drain-Source On-Resistance**

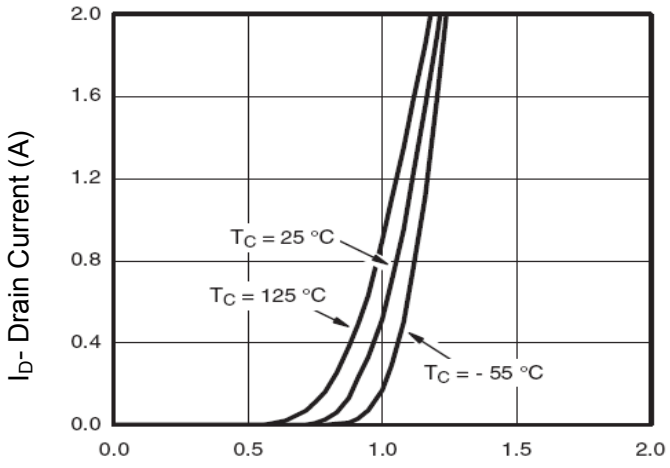



**Figure 7 Transfer Characteristics**

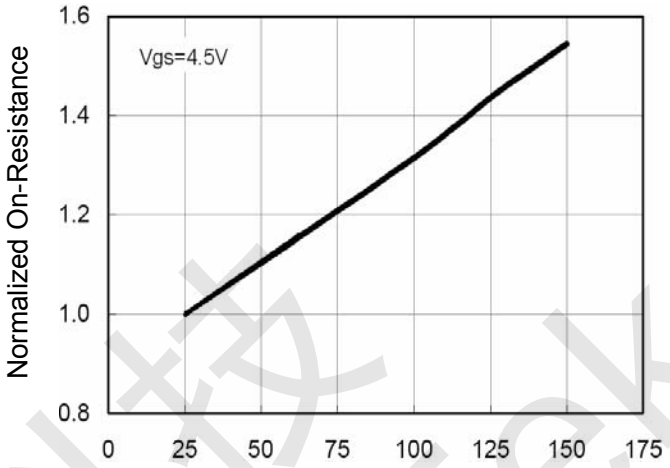



**Figure 8 Drain-Source On-Resistance**

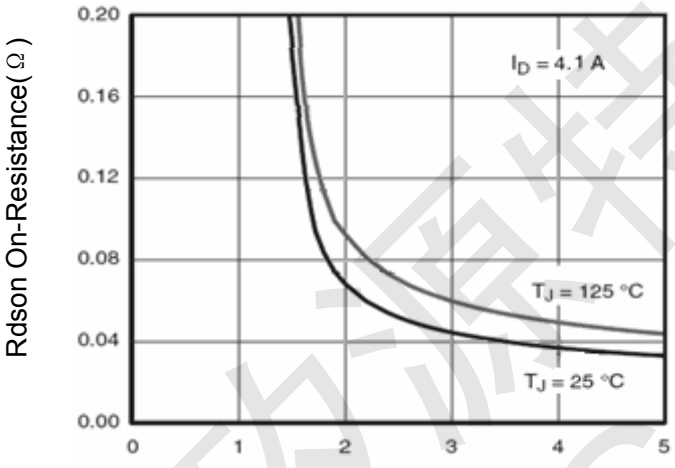



**Figure 9 Rdson vs Vgs**

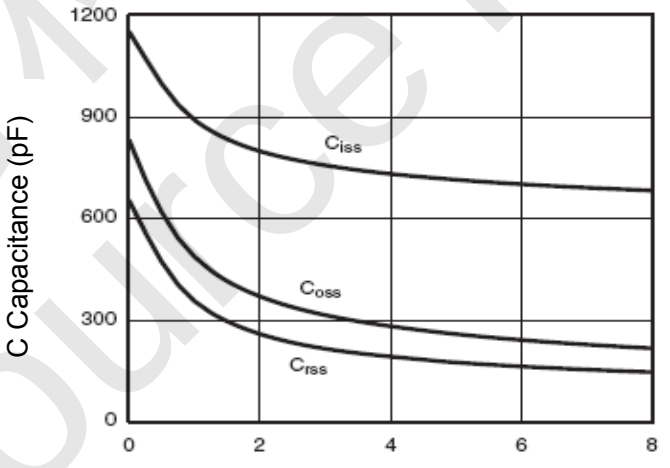



**Figure 10 Capacitance vs Vds**

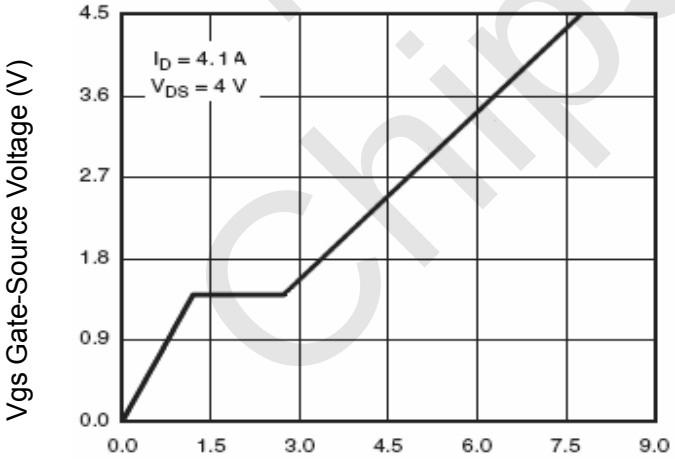



**Figure 11 Gate Charge**

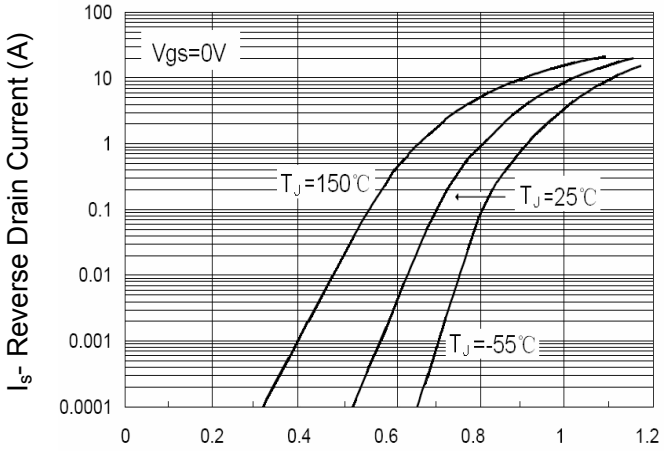



**Figure 12 Source- Drain Diode Forward**



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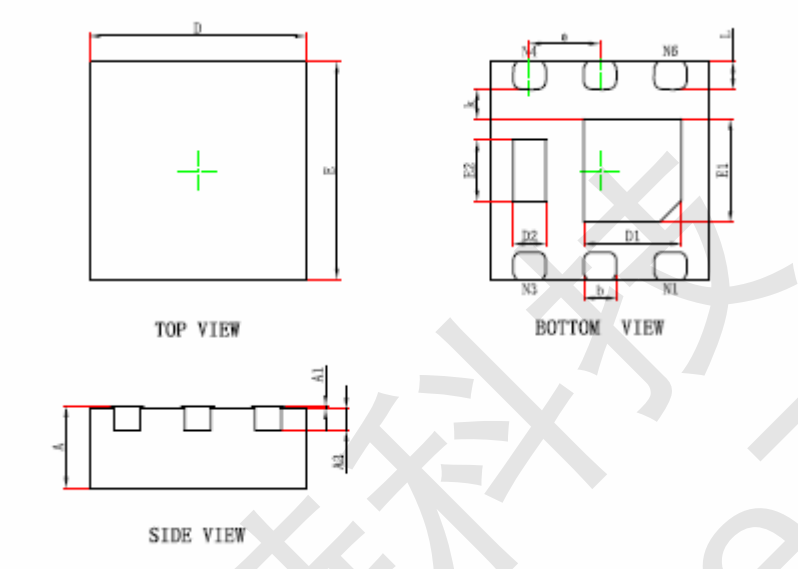
## CST415 DFN2020-6L Package Information




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 0.700 | 0.800 | 0.028 | 0.031 |
| A1 | 0.000 | 0.050 | 0.000 | 0.002 |
| A3 | 0.203REF. | | 0.008REF. | |
| D | 1.924 | 2.076 | 0.076 | 0.082 |
| E | 1.924 | 2.076 | 0.076 | 0.082 |
| D1 | 0.800 | 1.000 | 0.031 | 0.039 |
| E1 | 0.850 | 1.050 | 0.033 | 0.041 |
| D2 | 0.200 | 0.400 | 0.008 | 0.016 |
| E2 | 0.460 | 0.660 | 0.018 | 0.026 |
| k | 0.200MIN. | | 0.008MIN. | |
| b | 0.250 | 0.350 | 0.010 | 0.014 |
| e | 0.650TYP. | | 0.026TYP. | |
| L | 0.174 | 0.326 | 0.007 | 0.013 |



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