Elektronische Bauelemente

# SSI2154

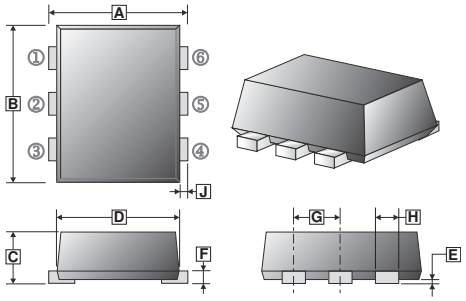
**800mA, 20V**
**Dual N-Channel MOSFET**

RoHS Compliant Product
A Suffix of "-C" specifies halogen & lead-free

## DESCRIPTIONS

The SSI2154 is N-Channel enhancement MOS Field Effect Transistor. Uses advanced trench technology and design to provide excellent RDS (ON)with low gate charge. This device is suitable for use in DC-DC conversion, load switch and level shift.

**SOT-563**



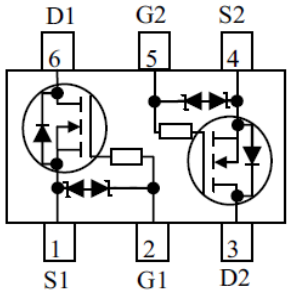

| REF. | Millimeter | | REF. | Millimeter | |
|---|---|---|---|---|---|
| | Min. | Max. | | Min. | Max. |
| A | 1.50 | 1.70 | F | 0.09 | 0.16 |
| B | 1.50 | 1.70 | G | 0.45 | 0.55 |
| C | 0.525 | 0.60 | H | 0.17 | 0.27 |
| D | 1.10 | 1.30 | J | 0.10 | 0.30 |
| E | - | 0.05 | | | |

## MECHANICAL DATA

- Trench Technology
- Supper high density cell design
- Excellent ON resistance
- Extremely Low Threshold Voltage

## APPLICATION

- DC-DC converter circuit
- Load Switch




## DEVICE MARKING:

**54**

## PACKAGE INFORMATION

| Package | MPQ | Leader Size |
|---|---|---|
| SOT-563 | 3K | 7' inch |

## MAXIMUM RATINGS ($T_A$ = 25℃ unless otherwise specified)

| Parameter | | Symbol | Rating | | Unit |
|---|---|---|---|---|---|
| | | | 10S | Steady State | |
| Drain – Source Voltage | | $V_{DS}$ | 20 | | V |
| Gate – Source Voltage | | $V_{GS}$ | ±6 | | V |
| Continuous Drain Current [1] | $T_A$= 25℃ | $I_D$ | 0.88 | 0.8 | A |
| | $T_A$= 70℃ | | 0.71 | 0.64 | |
| Power Dissipation [1] | $T_A$= 25℃ | $P_D$ | 0.37 | 0.3 | W |
| | $T_A$= 70℃ | | 0.23 | 0.19 | |
| Continuous Drain Current [2] | $T_A$= 25℃ | $I_D$ | 0.76 | 0.69 | A |
| | $T_A$= 70℃ | | 0.6 | 0.55 | |
| Power Dissipation [2] | $T_A$= 25℃ | $P_D$ | 0.27 | 0.22 | W |
| | $T_A$= 70℃ | | 0.17 | 0.14 | |
| Pulsed Drain Current [3] | | $I_{DM}$ | 1.4 | | A |
| Maximum Junction-to-Lead | | $R_{\theta JL}$ | 260 | | ℃ / W |
| Operating Junction & Storage Temperature Range | | $T_J$, $T_{STG}$ | -55~150 | | ℃ |

## THERMAL RESISTANCE RATINGS

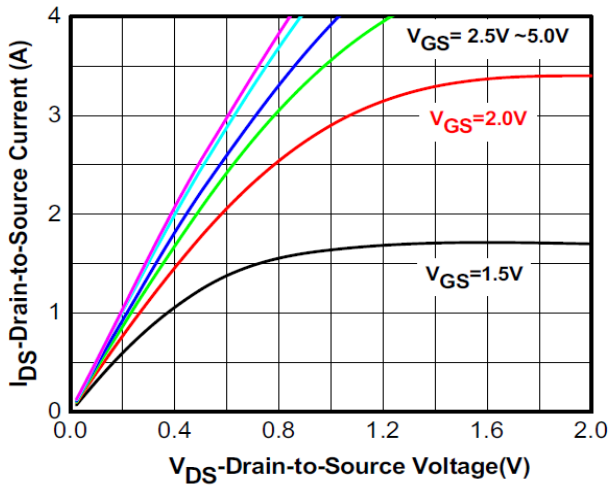
| Parameter | | Symbol | Rating | | Unit |
|---|---|---|---|---|---|
| | | | Typ. | Max. | |
| Single Operation | | | | | |
| Junction-to-Ambient Thermal Resistance [1] | T≦10S | $R_{\theta JA}$ | 285 | 335 | ℃ / W |
| | Steady State | | 340 | 405 | |
| Junction-to-Ambient Thermal Resistance [2] | T≦10S | $R_{\theta JA}$ | 385 | 450 | |
| | Steady State | | 455 | 545 | |
| Junction-to-Case Thermal Resistance | Steady State | $R_{\theta JC}$ | 260 | 300 | |
| Dual Operation | | | | | |
| Junction-to-Ambient Thermal Resistance [1] | T≦10S | $R_{\theta JA}$ | 315 | 365 | ℃ / W |
| | Steady State | | 370 | 440 | |
| Junction-to-Ambient Thermal Resistance [2] | T≦10S | $R_{\theta JA}$ | 420 | 490 | |
| | Steady State | | 505 | 585 | |
| Junction-to-Case Thermal Resistance | Steady State | $R_{\theta JC}$ | 265 | 305 | |

Note:
1. Surface mounted on FR4 Board using 1 square inch pad size, 1oz copper.
2. Surface mounted on FR4 board using minimum pad size, 1oz copper
3. Repetitive rating, pulse width limited by junction temperature, tp=10μs, Duty Cycle=1%
4. Repetitive rating, pulse width limited by junction temperature TJ=150℃.

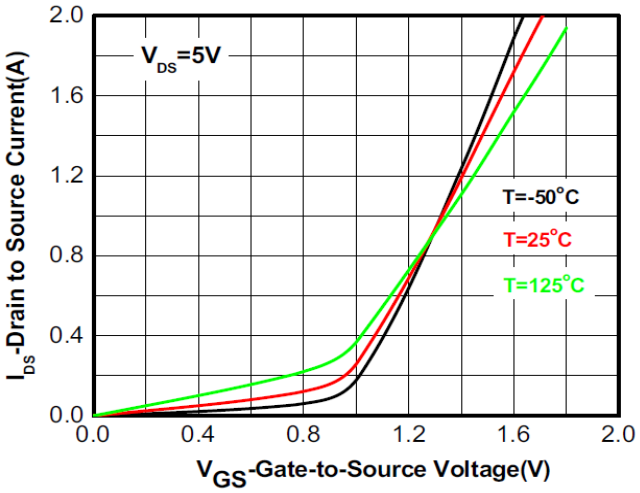
## ELECTRICAL CHARACTERISTICS ($T_A$=25℃ unless otherwise specified)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Teat Conditions |
|---|---|---|---|---|---|---|
| **Static** | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | 20 | - | - | V | $V_{GS}$=0, $I_D$=250μA |
| Zero Gate Voltage Drain Current | $I_{DSS}$ | - | - | 1 | μA | $V_{DS}$=16V, $V_{GS}$=0 |
| Gate-Source Leakage | $I_{GSS}$ | - | - | ±5 | μA | $V_{DS}$=0 , $V_{GS}$= ±5V |
| Gate-Threshold Voltage | $V_{GS(TH)}$ | 0.45 | 0.58 | 0.85 | V | $V_{DS}$=$V_{GS}$, $I_D$=250μA |
| Drain-Source On Resistance | $R_{DS(ON)}$ | - | 220 | 310 | mΩ | $V_{GS}$=4.5V, $I_D$=0.55A |
| | | - | 260 | 360 | | $V_{GS}$=2.5V, $I_D$=0.45A |
| | | - | 320 | 460 | | $V_{GS}$=1.8V, $I_D$=0.35A |
| Forward Transconductance | $g_{FS}$ | - | 2 | - | S | $V_{DS}$=5V, $I_D$= 0.55A |
| **Body-Drain Diode Ratings** | | | | | | |
| Diode Forward On–Voltage | $V_{SD}$ | 0.5 | 0.7 | 1.5 | V | $I_S$=350mA, $V_{GS}$=0 |
| **Dynamic Characteristics** | | | | | | |
| Input Capacitance | $C_{ISS}$ | - | 60 | - | pF | $V_{DS}$=10V, $V_{GS}$=0, f=100KHz |
| Output Capacitance | $C_{OSS}$ | - | 11 | - | | |
| Reverse Transfer Capacitance | $C_{RSS}$ | - | 7.5 | - | | |
| Total Gate Charge | $Q_{G(TOT)}$ | - | 1.15 | - | nC | $V_{DS}$=10V, $V_{GS}$=4.5V, $I_D$=0.55A |
| Threshold Gate Charge | $Q_{G(TH)}$ | - | 0.06 | - | | |
| Gate-to-Source Charge | $Q_{GS}$ | - | 0.15 | - | | |
| Gate-to-Drain Charge | $Q_{GD}$ | - | 0.23 | - | | |
| Turn-on Delay Time | $T_{d(ON)}$ | - | 22 | - | nS | $V_{DD}$=10V, $I_D$=0.55A, $V_{GS}$=4.5V, $R_G$=6Ω. |
| Rise Time | $T_r$ | - | 80 | - | | |
| Turn-off Delay Time | $T_{d(OFF)}$ | - | 700 | - | | |
| Fall Time | $T_f$ | - | 380 | - | | |

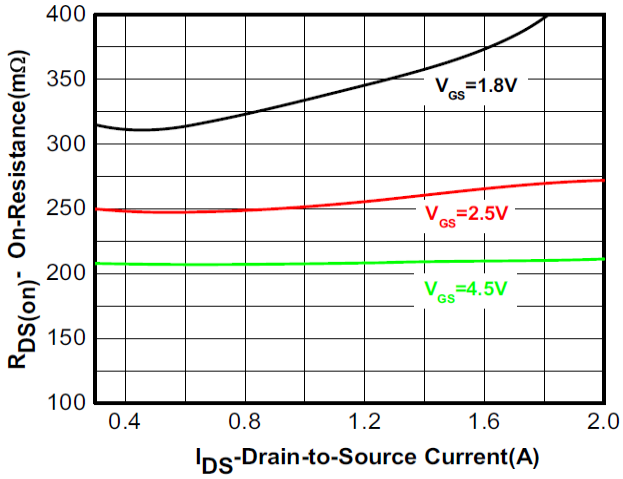
## CHARACTERISTIC CURVES



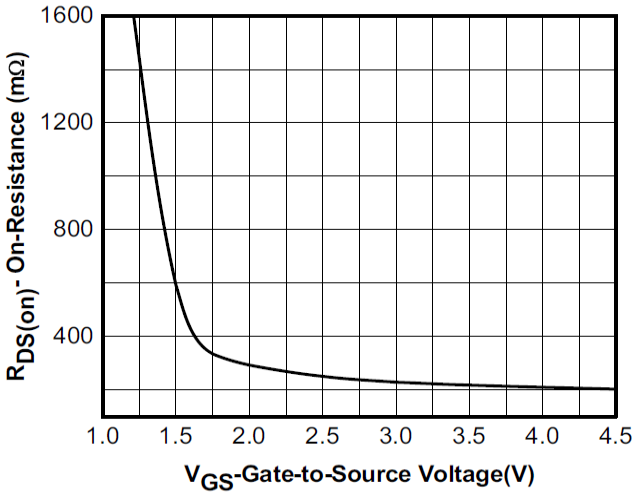

Output characteristics



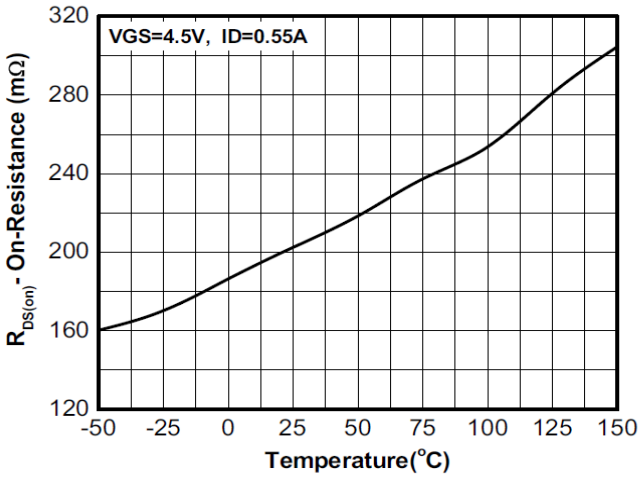

Transfer characteristics



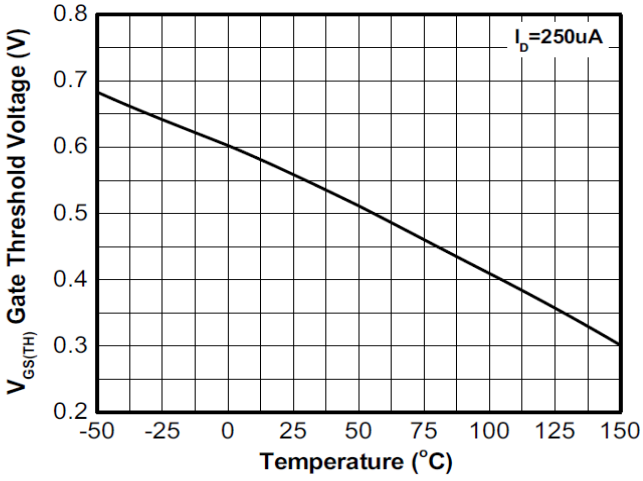

On-Resistance vs. Drain current




On-Resistance vs. Gate-to-Source voltage

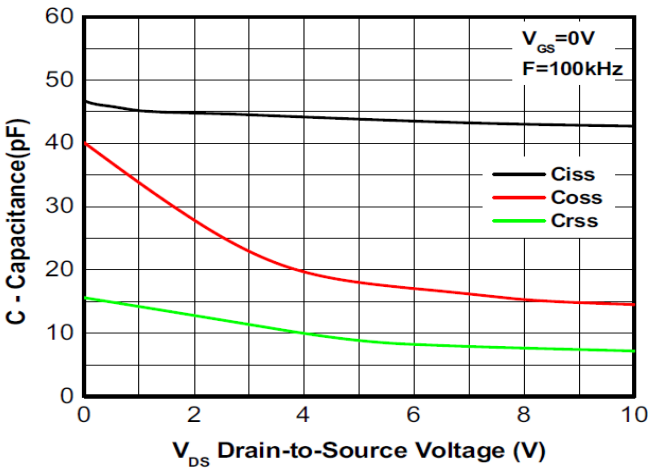



On-Resistance vs. Junction temperature

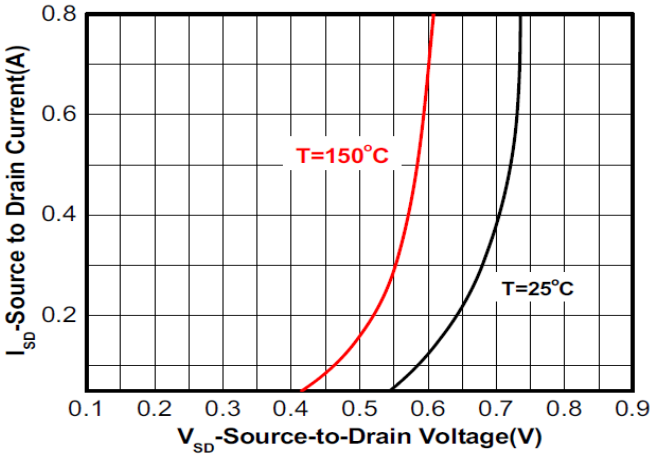



Threshold voltage vs. Temperature

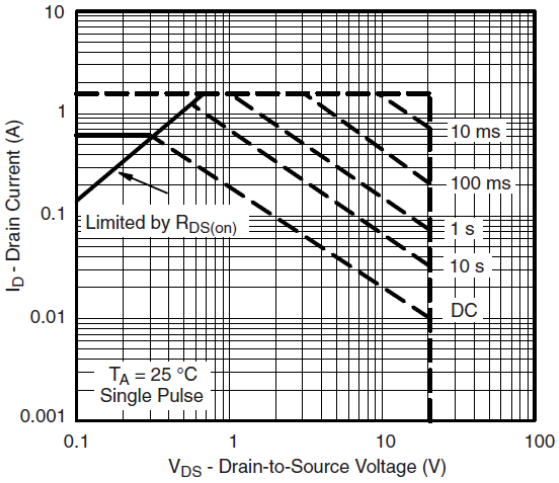
## CHARACTERISTIC CURVES



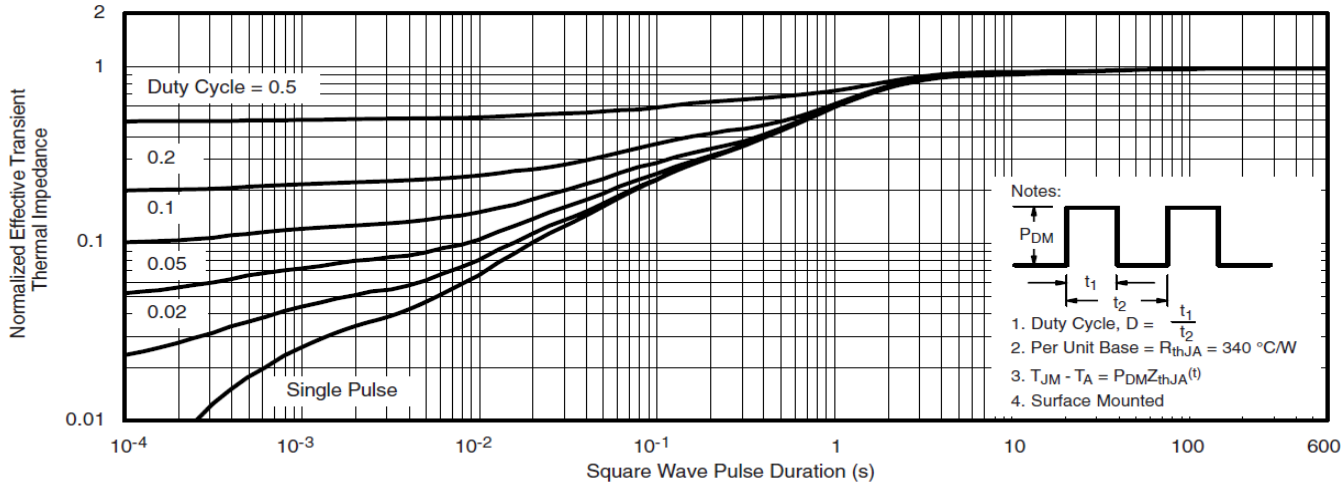

Capacitance




Body diode forward voltage




Safe operating power




Transient thermal response (Junction-to-Ambient)