SamHop Microelectronics Corp.

# STS6415

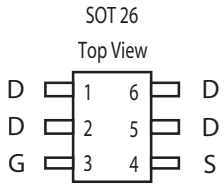
Ver 1.0

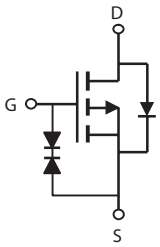
## P-Channel Enhancement Mode Field Effect Transistor

| PRODUCT SUMMARY | | |
|---|---|---|
| $V_{DSS}$ | $I_D$ | $R_{DS(ON)}$ (mΩ) Max |
| -20V | -2.8A | 100 @ VGS=-4.5V |
| | | 105 @ VGS=-4.0V |
| | | 110 @ VGS=-3.7V |
| | | 121 @ VGS=-3.1V |
| | | 138 @ VGS=-2.5V |

### FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Suface Mount Package.
- ESD Protected.




### ABSOLUTE MAXIMUM RATINGS ($T_A$=25°C unless otherwise noted)

| Symbol | Parameter | | Limit | Units |
|---|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | | -20 | V |
| $V_{GS}$ | Gate-Source Voltage | | ±10 | V |
| $I_D$ | Drain Current-Continuous [a] | $T_A$=25°C | -2.8 | A |
| | | $T_A$=70°C | -2.2 | A |
| $I_{DM}$ | -Pulsed [b] | | -10 | A |
| $P_D$ | Maximum Power Dissipation [a] | $T_A$=25°C | 1.25 | W |
| | | $T_A$=70°C | 0.8 | W |
| $T_J$, $T_{STG}$ | Operating Junction and Storage Temperature Range | | -55 to 150 | °C |

### THERMAL CHARACTERISTICS

| | | | |
|---|---|---|---|
| $R_{\theta JA}$ | Thermal Resistance, Junction-to-Ambient [a] | 100 | °C/W |

## ELECTRICAL CHARACTERISTICS ($T_A$=25°C unless otherwise noted)

| Symbol | Parameter | Conditions | Min | Typ | Max | Units |
|---|---|---|---|---|---|---|
| **OFF CHARACTERISTICS** | | | | | | |
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | $V_{GS}$=0V , $I_D$=-250uA | -20 | | | V |
| $I_{DSS}$ | Zero Gate Voltage Drain Current | $V_{DS}$=-16V , $V_{GS}$=0V | | | 1 | uA |
| $I_{GSS}$ | Gate-Body Leakage Current | $V_{GS}$= ±10V , $V_{DS}$=0V | | | ±10 | uA |
| **ON CHARACTERISTICS** | | | | | | |
| $V_{GS(th)}$ | Gate Threshold Voltage | $V_{DS}$=$V_{GS}$ , $I_D$=-1mA | -0.5 | -0.8 | -1.5 | V |
| $R_{DS(ON)}$ | Drain-Source On-State Resistance | $V_{GS}$=-4.5V , $I_D$=-1.4A | 62 | 76 | 100 | m ohm |
| | | $V_{GS}$=-4.0V , $I_D$=-1.4A | 65 | 80 | 105 | m ohm |
| | | $V_{GS}$=-3.7V , $I_D$=-1.4A | 68 | 83 | 110 | m ohm |
| | | $V_{GS}$=-3.1V , $I_D$=-1.4A | 74 | 90 | 121 | m ohm |
| | | $V_{GS}$=-2.5V , $I_D$=-1.4A | 82 | 102 | 138 | m ohm |
| $g_{FS}$ | Forward Transconductance | $V_{DS}$=-5V , $I_D$=-1.4A | | 6 | | S |
| **DYNAMIC CHARACTERISTICS** [c] | | | | | | |
| $C_{ISS}$ | Input Capacitance | $V_{DS}$=-10V,$V_{GS}$=0V f=1.0MHz | | 347 | | pF |
| $C_{OSS}$ | Output Capacitance | | | 100 | | pF |
| $C_{RSS}$ | Reverse Transfer Capacitance | | | 81 | | pF |
| **SWITCHING CHARACTERISTICS** [c] | | | | | | |
| $t_{D(ON)}$ | Turn-On Delay Time | $V_{DD}$=-16V $I_D$=-1.4A $V_{GS}$=-4.5V $R_{GEN}$= 6 ohm | | 17 | | ns |
| $t_r$ | Rise Time | | | 30 | | ns |
| $t_{D(OFF)}$ | Turn-Off Delay Time | | | 15 | | ns |
| $t_f$ | Fall Time | | | 8.3 | | ns |
| $Q_g$ | Total Gate Charge | $V_{DS}$=-16V,$I_D$=-2.8A, $V_{GS}$=-4.5V | | 5 | | nC |
| $Q_{gs}$ | Gate-Source Charge | | | 0.4 | | nC |
| $Q_{gd}$ | Gate-Drain Charge | | | 2.2 | | nC |
| **DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS** | | | | | | |
| $V_{SD}$ | Diode Forward Voltage | $V_{GS}$=0V,$I_S$=-0.5A | | -0.8 | -1.2 | V |

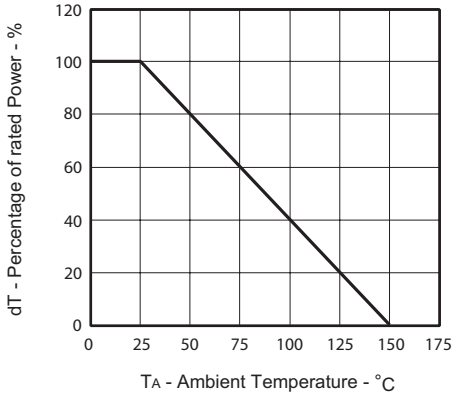
Notes

a.Surface Mounted on FR4 Board,t ≤ 10sec.

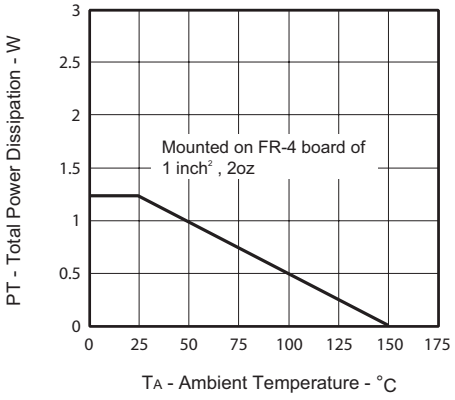
b.Pulse Test:Pulse Width ≤ 10us, Duty Cycle ≤ 1%.

c.Guaranteed by design, not subject to production testing.

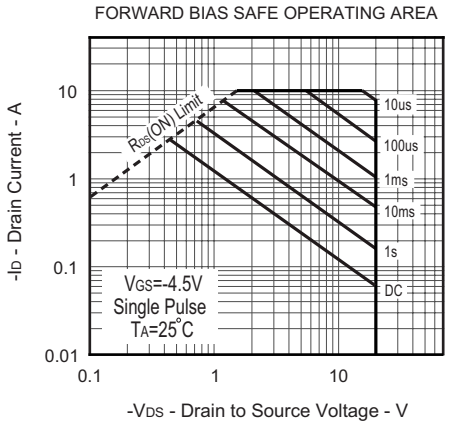
DERATING FACTOR OF FORWARD BIAS SAFE OPERATING AREA



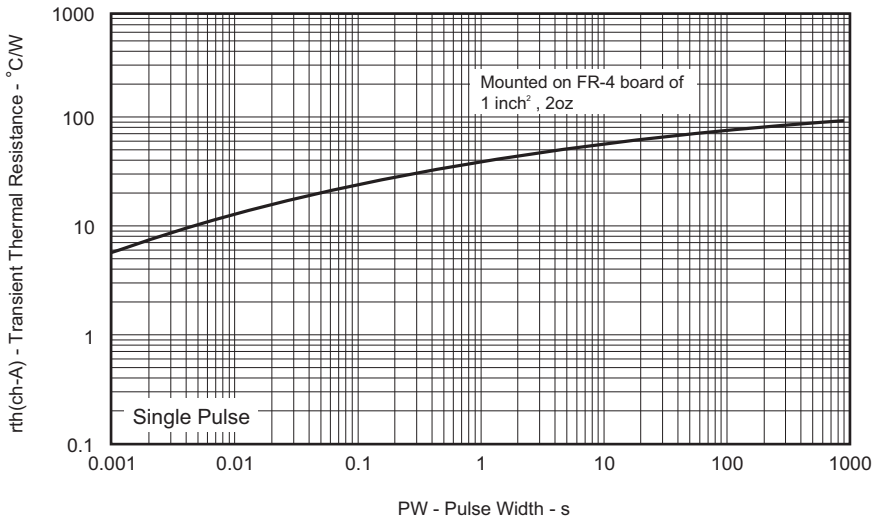

TOTAL POWER DISSIPATION vs. AMBIENT TEMPERATURE



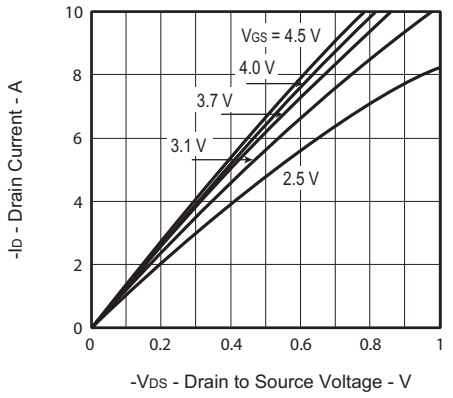

FORWARD BIAS SAFE OPERATING AREA



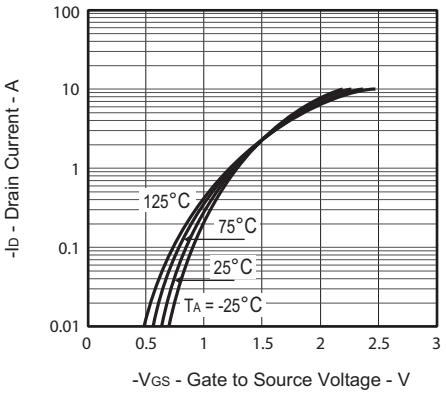

TRANSIENT THERMAL RESISTANCE vs. PULSE WIDTH



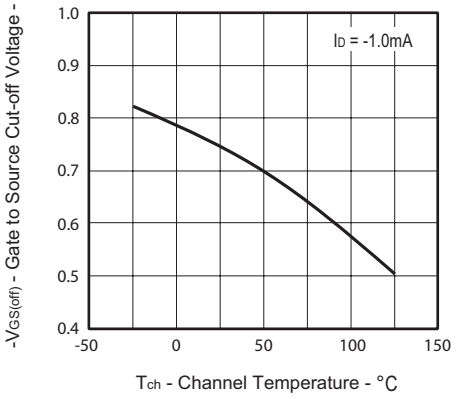
DRAIN CURRENT vs.
DRAIN TO SOURCE VOLTAGE



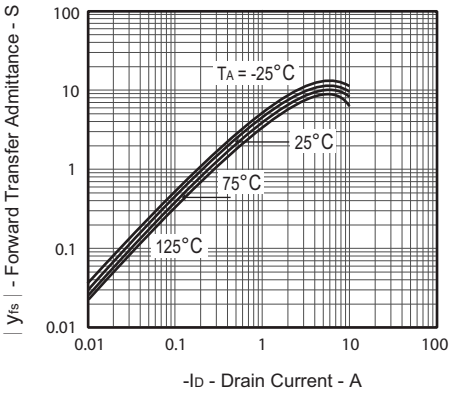

FORWARD TRANSFER CHARACTERISTICS



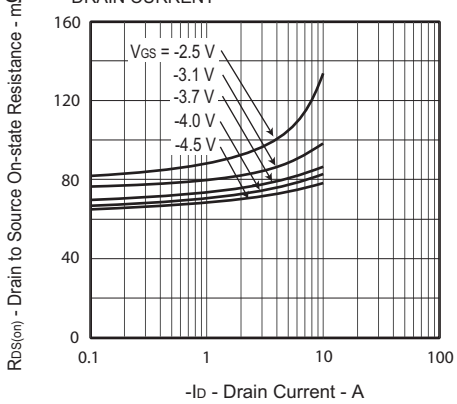

GATEBTO SOURE CUT-OFF VOLTAGE vs.
CHANNEL TEMPERATURE



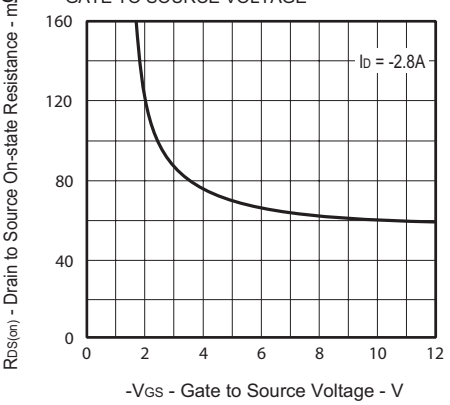

FORWARD TRANSFER ADMITTANCE vs.
DRAIN CURRENT



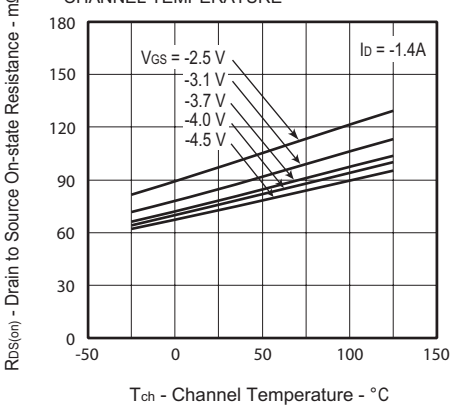

DRAIN TO SOURCE ON-STATE RESISTANCE vs.
DRAIN CURRENT



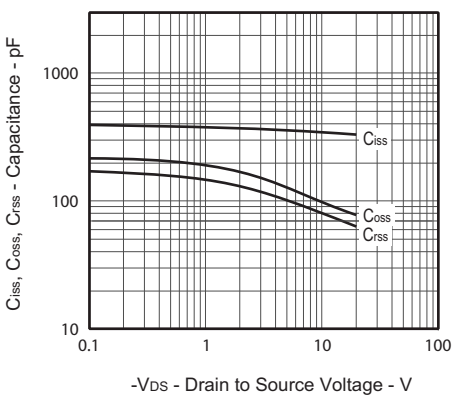

DRAIN TO SOURCE ON-STATE RESISTANCE vs.
GATE TO SOURCE VOLTAGE



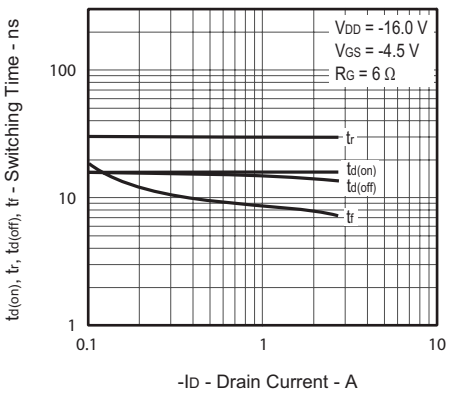
DRAIN TO SOURCE ON-STATE RESISTANCE vs. CHANNEL TEMPERATURE



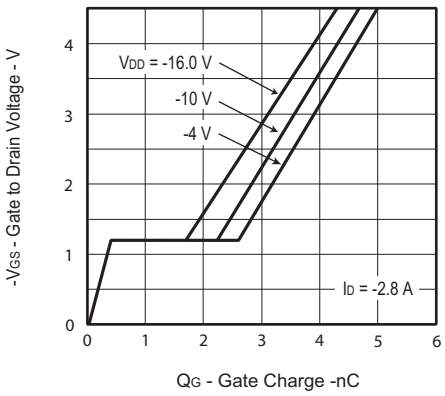

CAPACITANCE vs. DRAIN TO SOURCE VOLTAGE



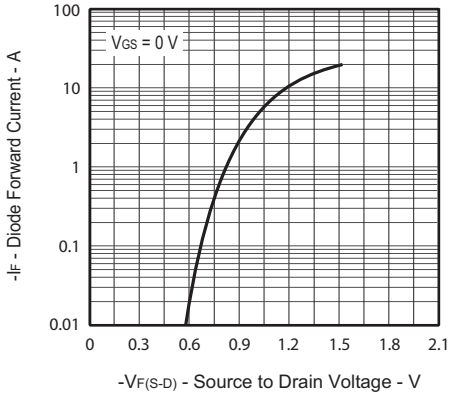

SWITCHING CHARACTERISTICS




DYNAMIC INPUT CHARACTERISTICS

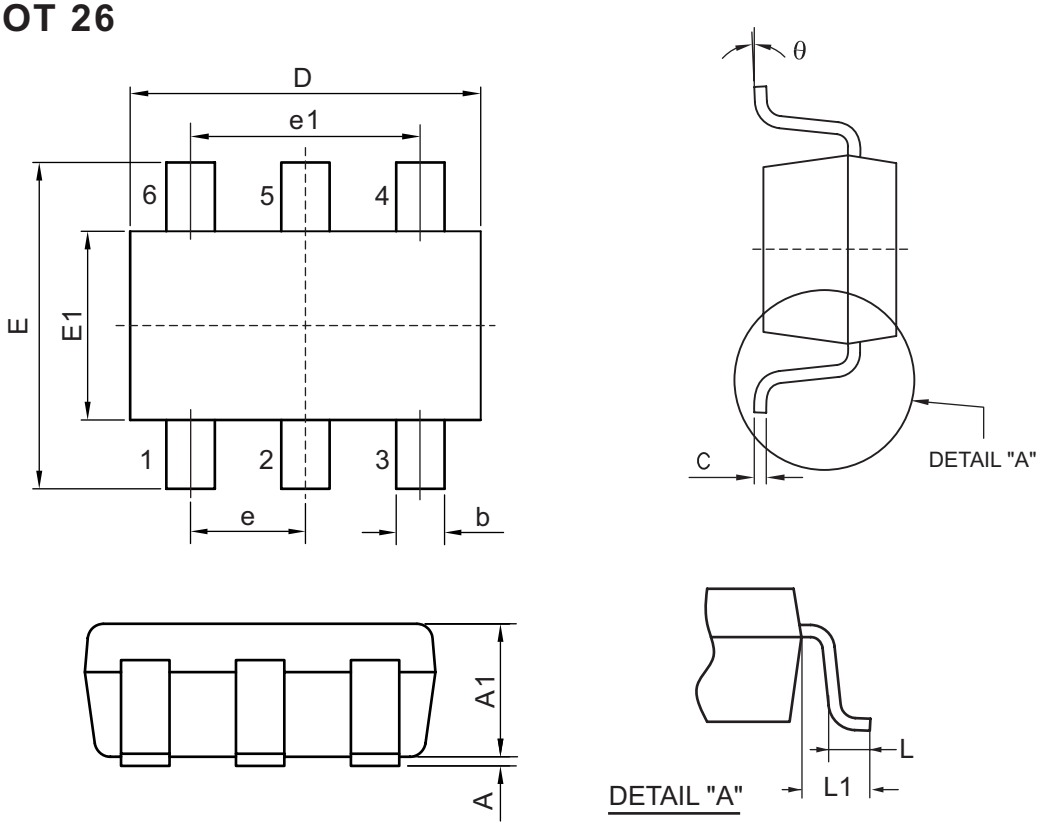



SOURCE TO DRAIN DIODE FORWARD VOLTAGE



## PACKAGE OUTLINE DIMENSIONS

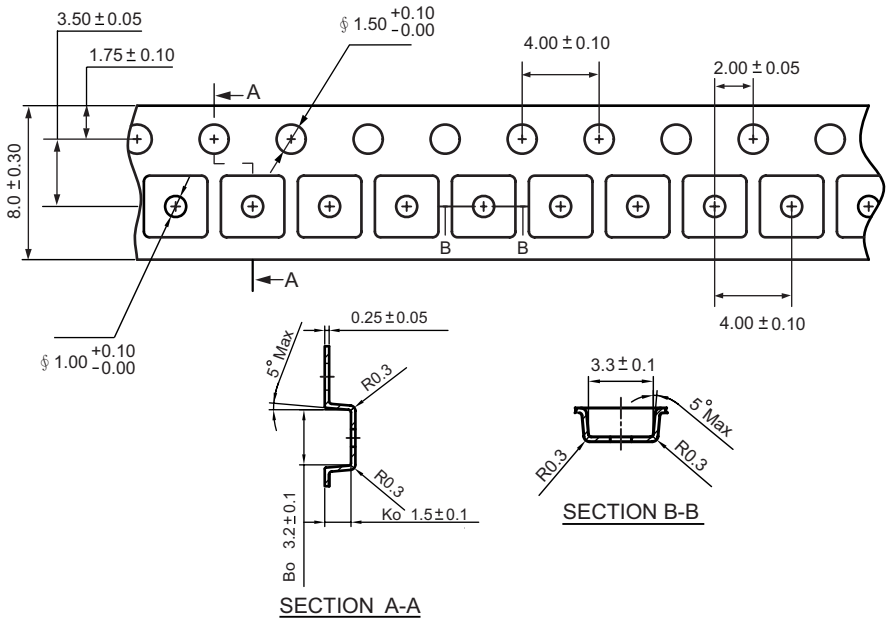
### TSOT 26



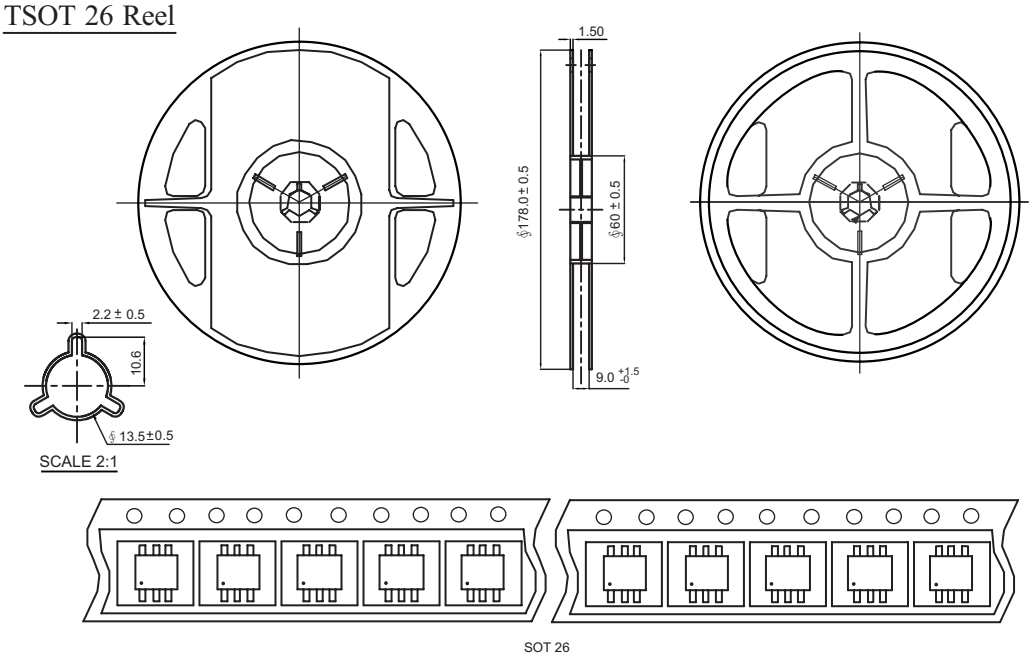

| SYMBOLS | MILLIMETERS | | INCHES | |
|---|---|---|---|---|
| | MIN | MAX | MIN | MAX |
| D | 2.692 | 3.099 | 0.106 | 0.122 |
| E | 2.591 | 3.000 | 0.102 | 0.118 |
| E1 | 1.397 | 1.803 | 0.055 | 0.071 |
| e | 0.950 REF. | | 0.037 REF. | |
| e1 | 1.900 REF. | | 0.075 REF. | |
| b | 0.300 | 0.500 | 0.012 | 0.020 |
| C | 0.080 | 0.200 | 0.003 | 0.008 |
| A | 0.000 | 0.100 | 0.000 | 0.004 |
| A1 | 0.700 | 0.800 | 0.028 | 0.032 |
| L | 0.300 | 0.600 | 0.012 | 0.024 |
| L1 | 0.600 REF. | | 0.023 REF. | |
| θ | 0° | 6° | 0° | 6° |

# TSOT 26 Tape and Reel Data

## TSOT 26 Carrier Tape




## TSOT 26 Reel






SOT 26