## Product Summary

- $V_{DS}$ = -20V, $I_D$ = -4.1A

  $R_{DS(ON)}$ <75mΩ @ $V_{GS}$=-2.5V

  $R_{DS(ON)}$ < 52mΩ @ $V_{GS}$=-4.5V

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

## Application

- Load/Power Switching
- Interfacing Switching
- Logic Level Shift

## Package and Pin Configuration

SOT-23



## Circuit diagram



Marking:  5Pxx
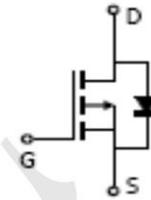
"P" is TECHPUBLIC LOGO
"5P" is Part number,fixed
"xx"is internal code

## Absolute Maximum Ratings (T$_A$=25℃ unless otherwise noted)

| Parameter | | Symbol | Limit | Unit |
|---|---|---|---|---|
| Drain-Source Voltage | | $V_{DS}$ | -20 | V |
| Gate-Source Voltage | | $V_{GS}$ | ±12 | V |
| Continuous Drain Current | $T_C$ =25℃ | $I_D$ | -4.1 | A |
| | $T_C$ =70℃ | | -3.2 | |
| | $T_A$ =25℃ | | -3 | |
| | $T_A$ =70℃ | | -2.3 | |
| Drain Current -Pulsed (Note 1) | | $I_{DM}$ | -15 | A |
| Maximum Power Dissipation | | $P_D$ | 1.7 | W |
| Operating Junction and Storage Temperature Range | | $T_J, T_{STG}$ | -55 To 150 | ℃ |

## Thermal Characteristic

| | Symbol | | Unit |
|---|---|---|---|
| Thermal Resistance,Junction-to-Ambient (Note 2) | $R_{θJA}$ | 74 | ℃/W |

## Electrical Characteristics (T$_A$=25℃ unless otherwise noted)

| Parameter | Symbol | Condition | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **Off Characteristics** | | | | | | |
| Drain-Source Breakdown Voltage | BV$_{DSS}$ | V$_{GS}$=0V I$_D$=-250µA | -20 | - | - | V |
| Zero Gate Voltage Drain Current | I$_{DSS}$ | V$_{DS}$=-20V,V$_{GS}$=0V | - | - | -1 | µA |
| Gate-Body Leakage Current | I$_{GSS}$ | V$_{GS}$=±12V,V$_{DS}$=0V | - | - | ±100 | nA |
| **On Characteristics (Note 3)** | | | | | | |
| 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 | - | 39 | 52 | mΩ |
| | | V$_{GS}$=-2.5V, I$_D$=-3A | - | 58 | 75 | |
| Forward Transconductance | g$_{FS}$ | V$_{DS}$=-5V,I$_D$=-2A | 6 | - | - | S |
| **Dynamic Characteristics (Note4)** | | | | | | |
| Input Capacitance | C$_{Iss}$ | 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$_D$=-3.3A , 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$_S$=-1.6A | - | - | -1.2 | V |
| Diode Forward Current (Note 2) | I$_S$ | | - | - | 1.6 | A |

**Typical Electrical and Thermal Characteristics**
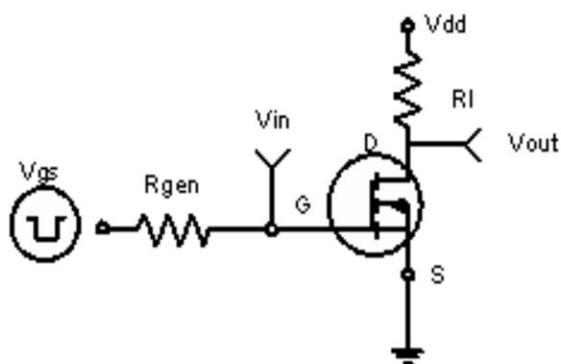


**Figure 1:Switching Test Circuit**
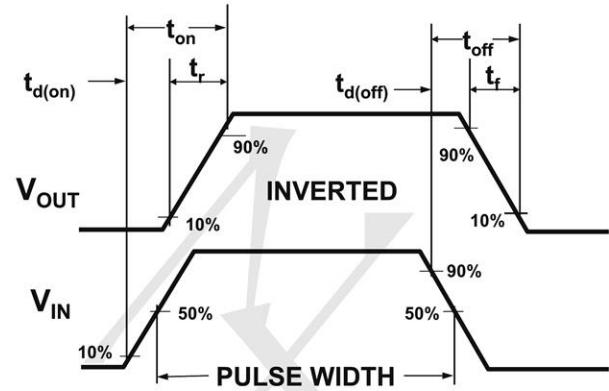


**Figure 2:Switching Waveforms**



$T_J$-Junction Temperature(℃)
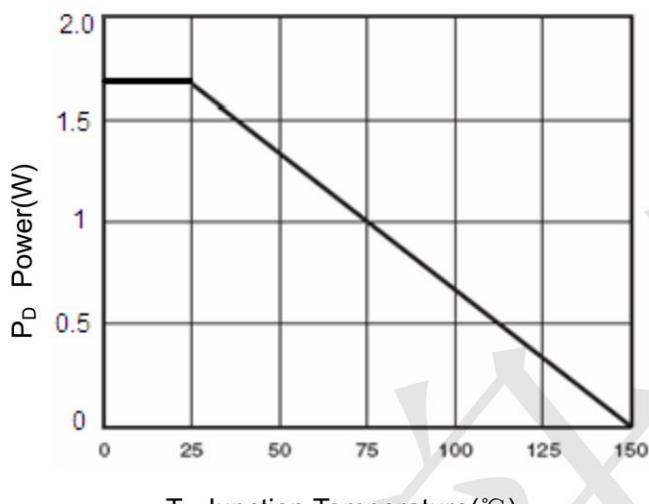
**Figure 3 Power Dissipation**



$T_J$-Junction Temperature(℃)

**Figure 4 Drain Current**



Vds Drain-Source Voltage (V)
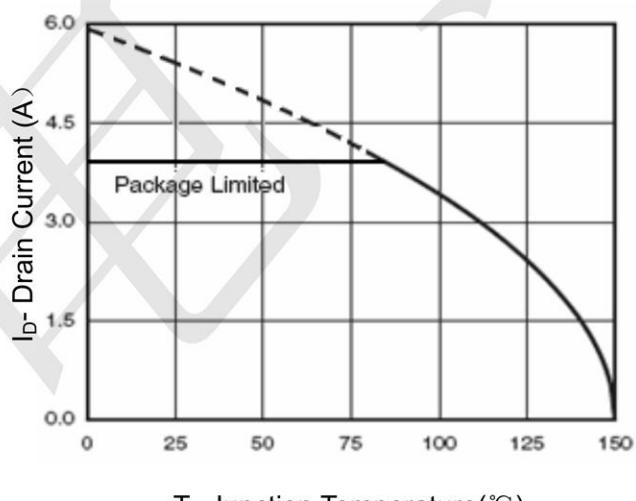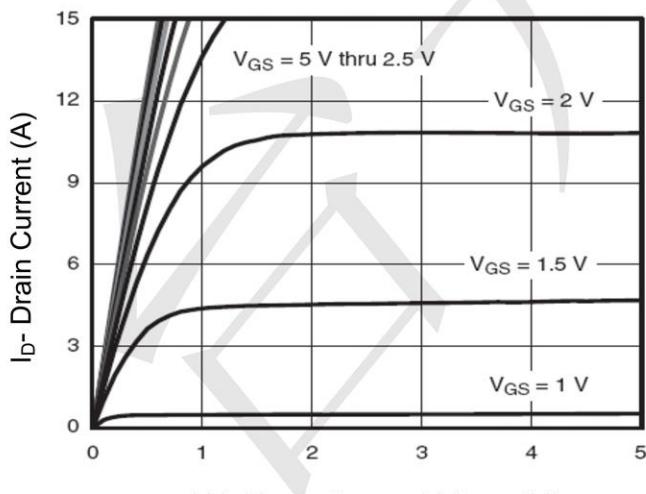
**Figure 5 Output Characteristics**



$I_D$- Drain Current (A)
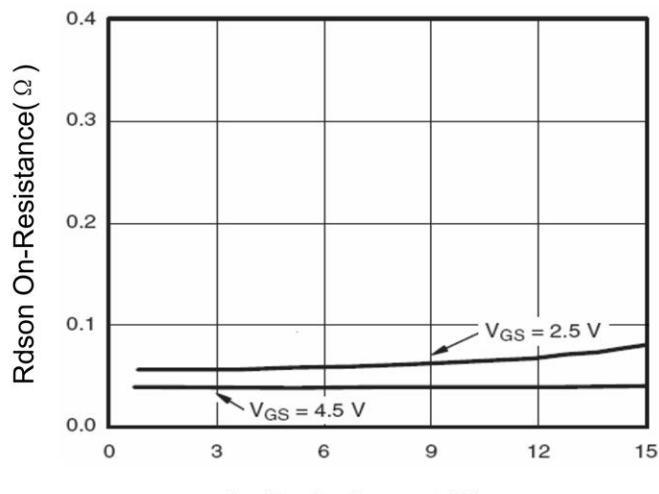
**Figure 6 Drain-Source On-Resistance**

3
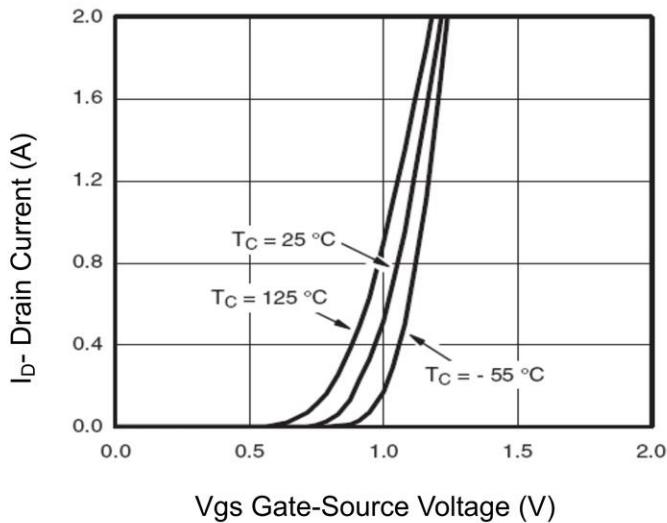
**Figure 7 Transfer Characteristics**
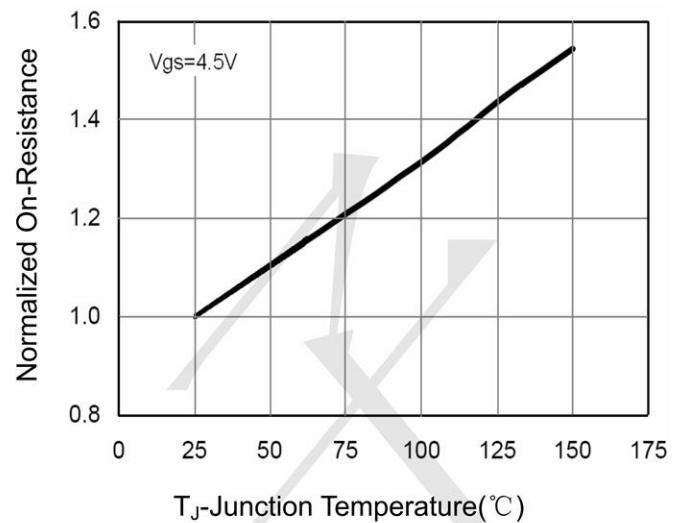


**Figure 8 Drain-Source On-Resistance**
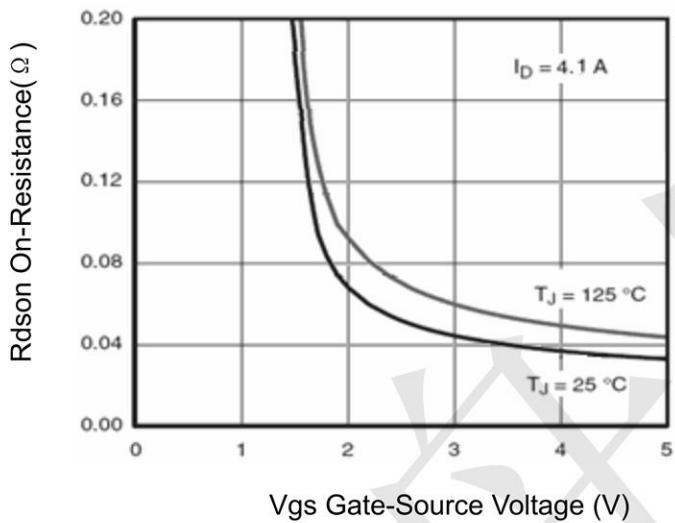


**Figure 9 Rdson vs Vgs**
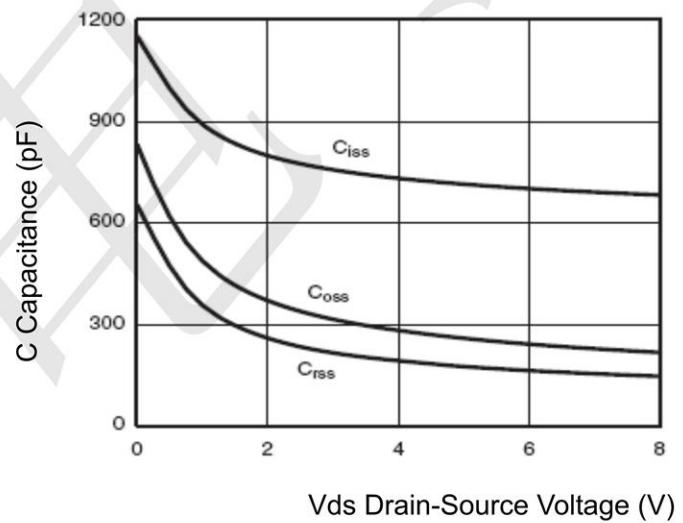


**Figure 10 Capacitance vs Vds**
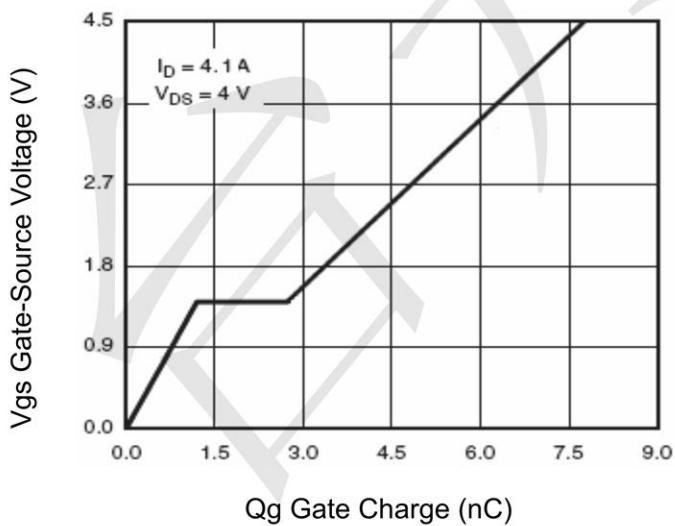


**Figure 11 Gate Charge**
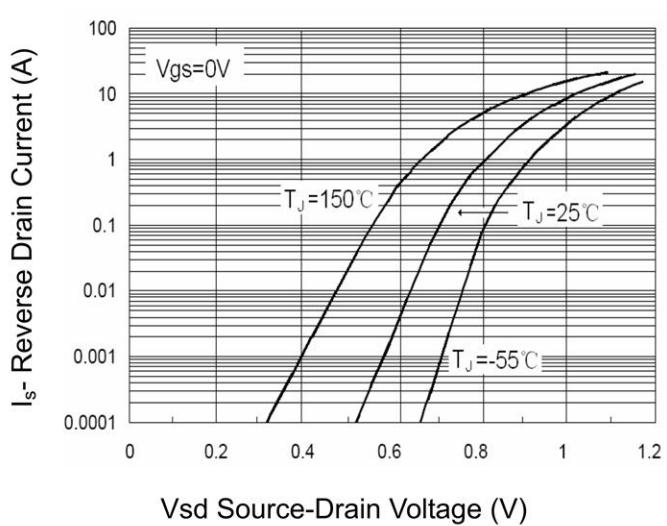


**Figure 12 Source- Drain Diode Forward**

4
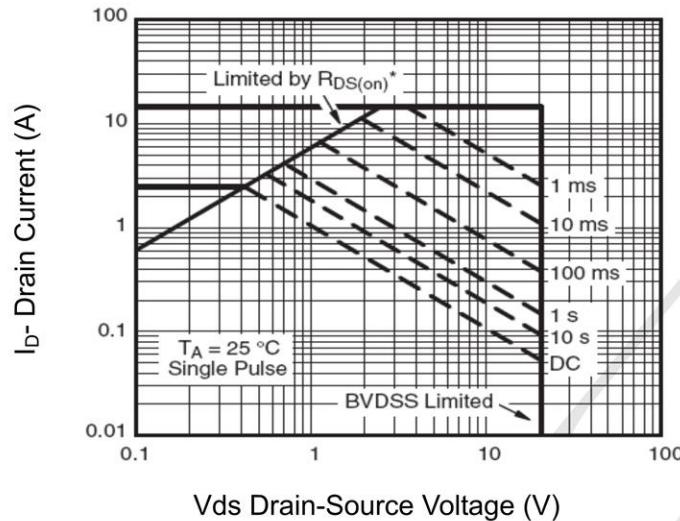
**Figure 13 Safe Operation Area**



Square Wave Pluse Duration(sec)
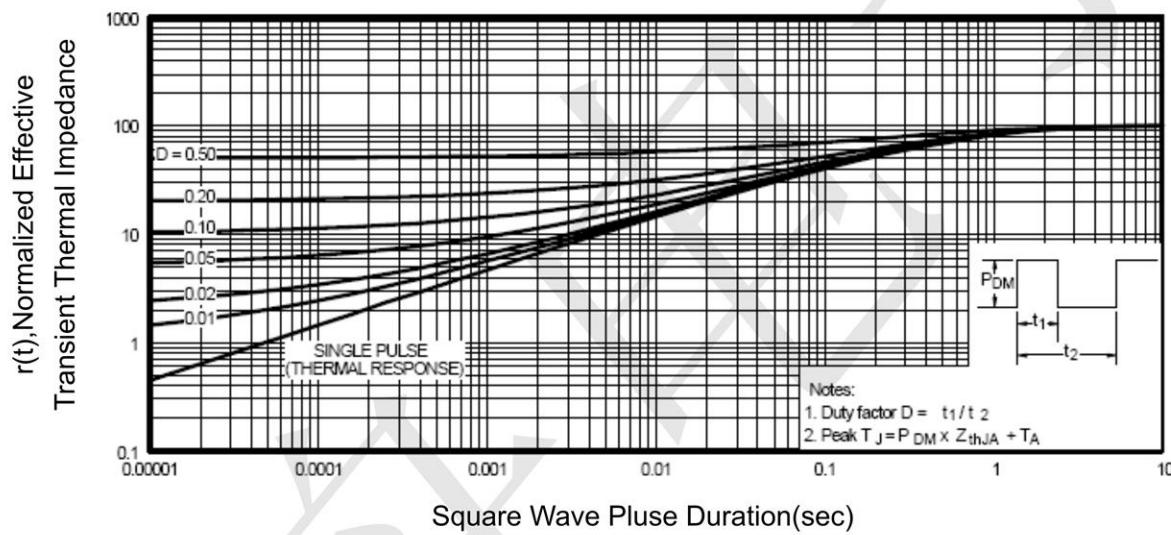
**Figure 14 Normalized Maximum Transient Thermal Impedance**

**SOT-23 Package Information**
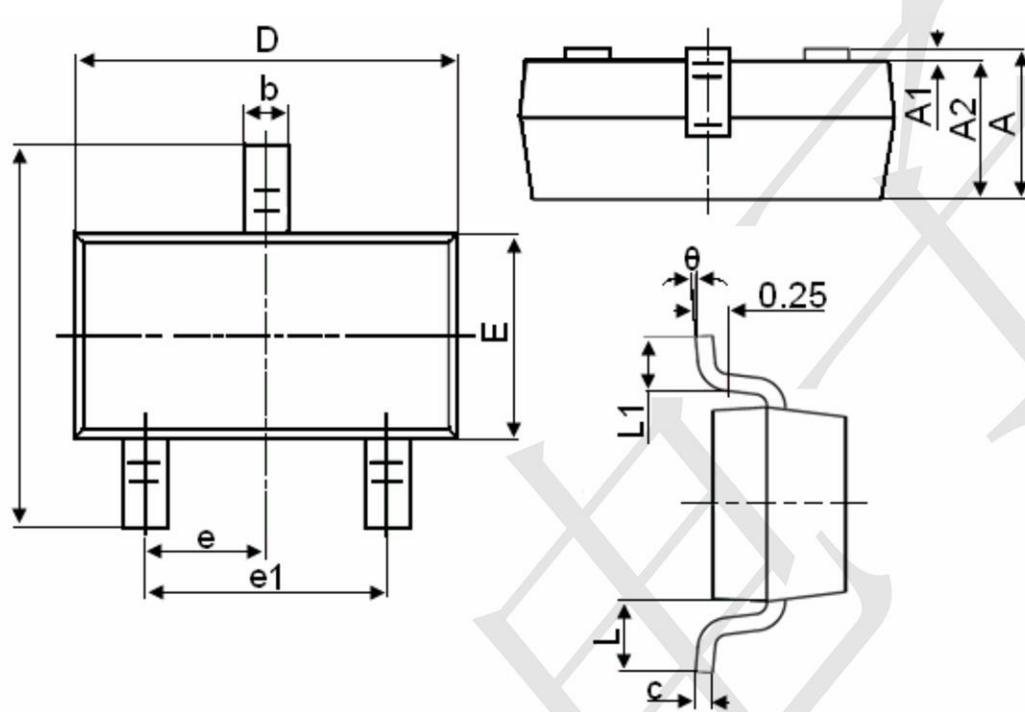


| Symbol | Dimensions in Millimeters | |
|---|---|---|
| | MIN. | MAX. |
| A | 0.900 | 1.150 |
| A1 | 0.000 | 0.100 |
| A2 | 0.900 | 1.050 |
| b | 0.300 | 0.500 |
| c | 0.080 | 0.150 |
| D | 2.800 | 3.000 |
| E | 1.200 | 1.400 |
| E1 | 2.250 | 2.550 |
| e | 0.950TYP | |
| e1 | 1.800 | 2.000 |
| L | 0.550REF | |
| L1 | 0.300 | 0.500 |
| θ | 0° | 8° |

# X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for* MOSFET *category:*

*Click to view products by* TECH PUBLIC *manufacturer:*

Other Similar products are found below :

614233C  648584F  IRFD120  IRFF430  JANTX2N5237  2N7000  FCA20N60_F109  FDZ595PZ  AOD464  2SK2267(Q)  2SK2545(Q,T)  405094E  423220D  MIC4420CM-TR  VN1206L  614234A  715780A  SSM6J414TU,LF(T  751625C  PSMN4R2-30MLD  TK31J60W5,S1VQ(O  2SK2614(TE16L1,Q)  DMN1017UCP3-7  EFC2J004NUZTDG  FCAB21350L1  P85W28HP2F-7071  DMN1053UCP4-7   NTE2384  NTE2969  NTE6400A  DMN2080UCB4-7  DMN61D9UWQ-13  US6M2GTR  DMN31D5UDJ-7  SSM6P54TU,LF  DMP22D4UFO-7B  IPS60R3K4CEAKMA1  DMN1006UCA6-7  DMN16M9UCA6-7  STF5N65M6  STU5N65M6  C3M0021120D  DMN13M9UCA6-7  BSS340NWH6327XTSA1  MCM3400A-TP  DMTH10H4M6SPS-13  IRF40SC240ARMA1  IPS60R1K0PFD7SAKMA1  IPS60R360PFD7SAKMA1  IPS60R600PFD7SAKMA1