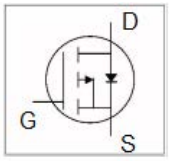
KGEY 金易半 Kingeavysemi

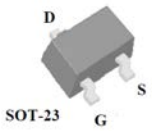
# KE8301T0U

***P-CHANNEL ENHANCEMENT MODE POWER MOSFET***

- **Simple Drive Requirement**
- **Small Package Outline**
- **Surface Mount Device**
- **RoHS Compliant & Halogen-Free**




| | |
|---|---|
| $BV_{DSS}$ | -30V |
| $R_{DS(ON)typ}$ | 47mΩ |
| $I_D$ | -4.2A |




## Description

KE8301 is from Kingeavy innovated design and silicon process technology to achieve the lowest possible on- resistance and fast switching performance. It provides the designer with an extreme efficient device for use in a wide range of power applications.

## Absolute Maximum Ratings@$T_j$=25°C(unless otherwise specified)

| Symbol | Parameter | Rating | Units |
|---|---|---|---|
| $V_{DS}$ | Drain-Source Voltage | -30 | V |
| $V_{GS}$ | Gate-Source Voltage | ±12 | V |
| $I_D$@$T_A$=25℃ | Drain Current, $V_{GS}$ @ 10V[3] | -4.2 | A |
| $I_D$@$T_A$=70℃ | Drain Current, $V_{GS}$ @ 10V[3] | -3.5 | A |
| $I_{DM}$ | Pulsed Drain Current[1] | -25 | A |
| $P_D$@$T_A$=25℃ | Total Power Dissipation[3] | 1 | W |
| $T_{STG}$ | Storage Temperature Range | -55 to 150 | ℃ |
| $T_J$ | Operating Junction Temperature Range | 150 | ℃ |

## Thermal Data

| Symbol | Parameter | Value | Unit |
|---|---|---|---|
| Rthj-a | Maximum Thermal Resistance, Junction-ambient[3] | 125 | ℃/W |

## Electrical Characteristics@$T_j$=25 oC(unless otherwise specified)

| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $BV_{DSS}$ | Drain-Source Breakdown Voltage | VGS=0V, ID=250uA | -30 | - | - | V |
| $R_{DS(ON)}$ | Static Drain-Source On-Resistance | VGS=10V, ID=-5.3A | - | 47 | 58 | mΩ |
| | | VGS=-4.5V, ID=-3A | - | 58 | 65 | mΩ |
| | | VGS=-2.5V, ID=-1A | - | 75 | 85 | mΩ |
| $V_{GS(th)}$ | Gate Threshold Voltage | VDS=VGS, ID=250uA | -0.7 | -0.9 | -1.2 | V |
| $g_{fs}$ | Forward Transconductance | VDS=5V, ID=-4A | - | 8 | - | S |
| $I_{DSS}$ | Drain-Source Leakage Current | VDS=24V, VGS=0V | - | - | -1 | uA |
| $I_{GSS}$ | Gate-Source Leakage | VGS=±12V, VDS=0V | - | - | ±100 | nA |
| $Q_g$ | Total Gate Charge | ID=4A<br>VDS=-24V<br>VGS=-4.5V | - | 11 | 20 | nC |
| $Q_{gs}$ | Gate-Source Charge | | - | 2 | - | nC |
| $Q_{gd}$ | Gate-Drain ("Miller") Charge | | - | 4 | - | nC |
| $t_{d(on)}$ | Turn-on Delay Time | VDS=-15V<br>ID=4A<br>RG=3.3Ω<br>VGS=-10V | - | 6.3 | - | ns |
| $t_r$ | Rise Time | | - | 3.2 | - | ns |
| $t_{d(off)}$ | Turn-off Delay Time | | - | 38.2 | - | ns |
| $t_f$ | Fall Time | | - | 12 | - | ns |
| $C_{iss}$ | Input Capacitance | VGS=0V<br>VDS=-25V<br>f=1.0MHz | - | 957 | - | pF |
| $C_{oss}$ | Output Capacitance | | - | 115 | - | pF |
| Crss | Reverse Transfer Capacitance | | - | 77 | - | pF |

## Source-Drain Diode

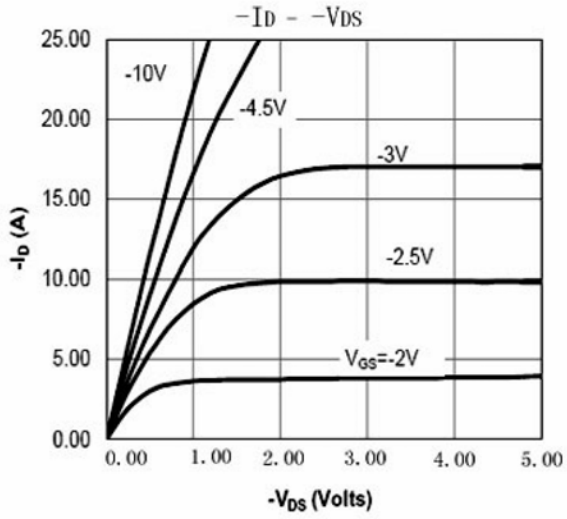
| Symbol | Parameter | Test Conditions | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|
| $V_{SD}$ | Forward On Voltage[2] | IS=1A, VGS=0V | - | - | -1 | V |

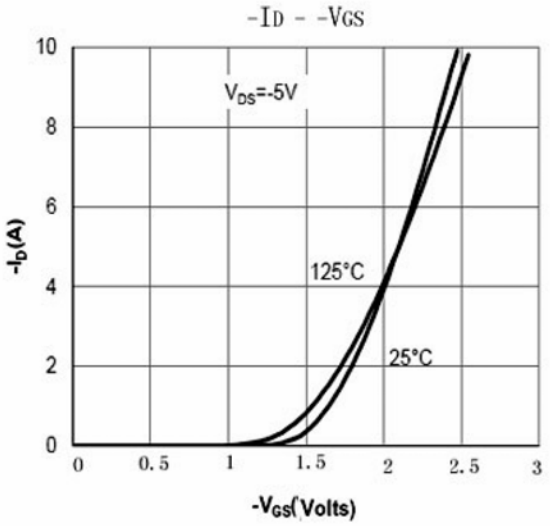
**Notes:**

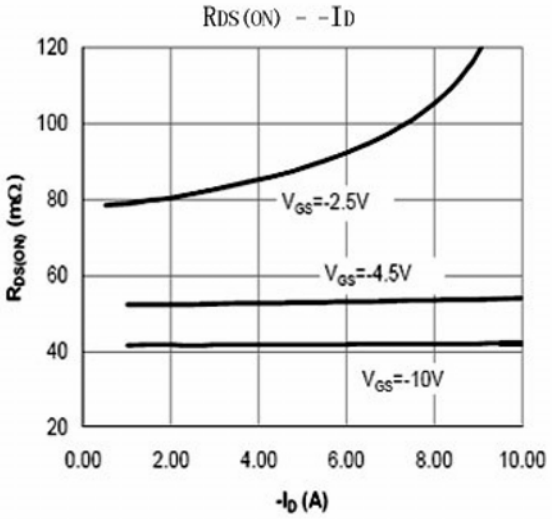
1.Pulse width limited by Max. junction temperature.

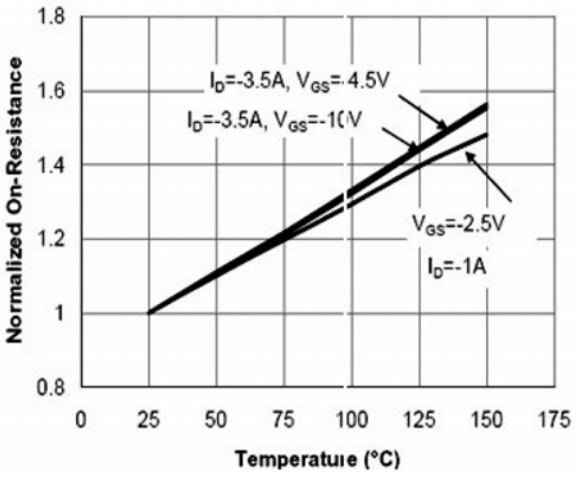
2.Pulse test

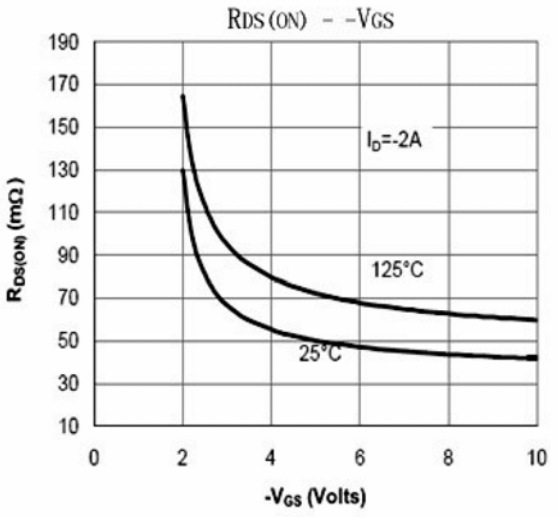
3.Surface mounted on 1 $in^2$ 2oz copper pad of FR4 board, t ≤10sec ; 300°C/W when mounted on min. copper pad.

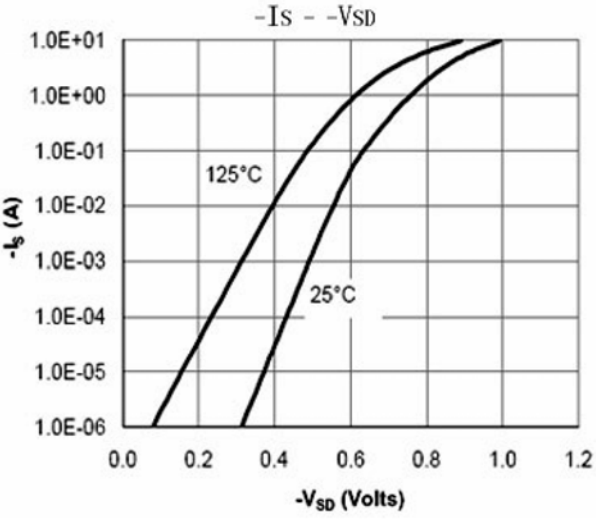

-ID - -VDS
25.00
20.00
15.00
10.00
5.00
0.00
-10V
-4.5V
-3V
-2.5V
VGS=-2V
0.00
1.00
2.00
3.00
4.00
5.00
-ID (A)
-VDS (Volts)

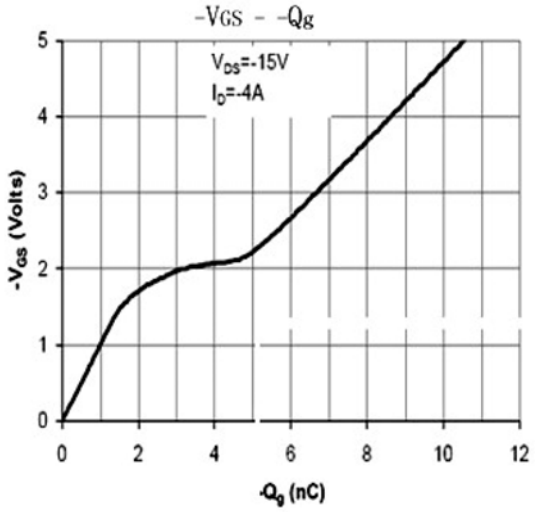

-ID - -VGS
10
8
6
4
2
0
VDS=-5V
125°C
25°C
0
0.5
1
1.5
2
2.5
3
-ID(A)
-VGS(Volts)

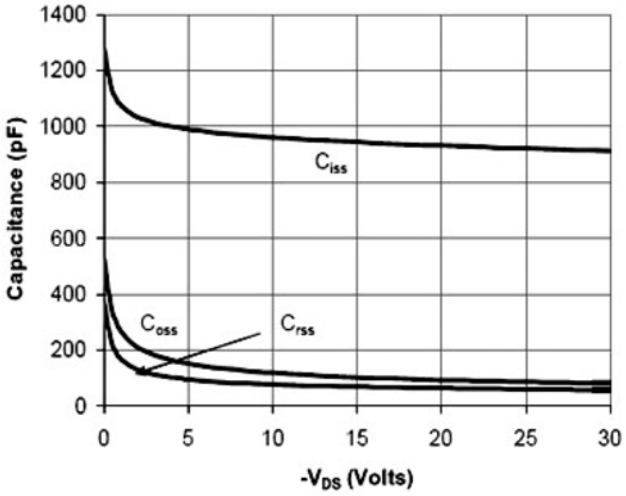

RDS(ON) - -ID
120
100
80
60
40
20
VGS=-2.5V
VGS=-4.5V
VGS=-10V
0.00
2.00
4.00
6.00
8.00
10.00
RDS(ON) (mΩ)
-ID (A)

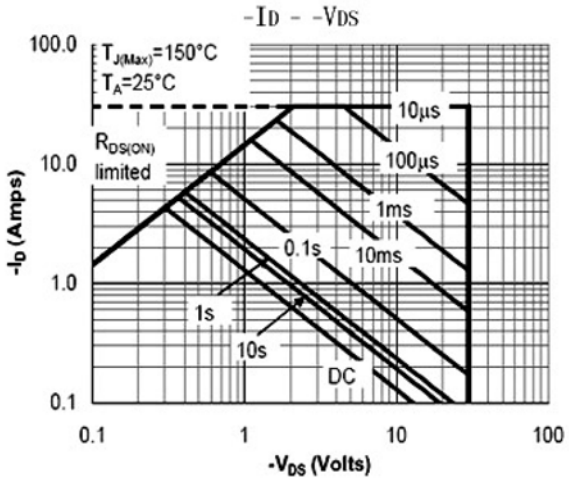

1.8
1.6
1.4
1.2
1
0.8
ID=-3.5A, VGS=-4.5V
ID=-3.5A, VGS=-10V
VGS=-2.5V
ID=-1A
0
25
50
75
100
125
150
175
Normalized On-Resistance
Temperature (°C)


RDS(ON) - -VGS
190
170
150
130
110
90
70
50
30
10
ID=-2A
125°C
25°C
0
2
4
6
8
10
RDS(ON) (mΩ)
-VGS (Volts)

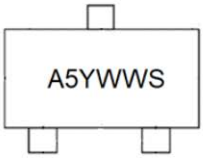

-IS - -VSD
1.0E+01
1.0E+00
1.0E-01
1.0E-02
1.0E-03
1.0E-04
1.0E-05
1.0E-06
125°C
25°C
0.0
0.2
0.4
0.6
0.8
1.0
1.2
-IS (A)
-VSD (Volts)


-VGS - -Qg
VDS=-15V
ID=-4A
-VGS (Volts)
-Qg (nC)
0
1
2
3
4
5
0
2
4
6
8
10
12


Capacitance (pF)
Ciss
Coss
Crss
-VDS (Volts)
0
200
400
600
800
1000
1200
1400
0
5
10
15
20
25
30

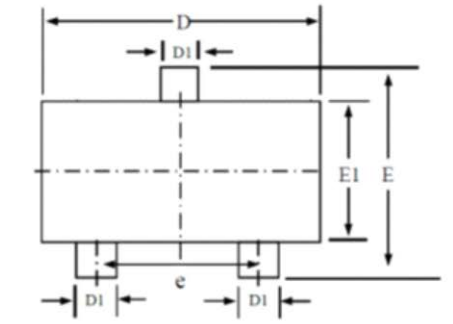

-ID - -VDS
TJ(Max)=150°C
TA=25°C
RDS(ON) limited
10µs
100µs
1ms
10ms
0.1s
1s
10s
DC
-ID (Amps)
-VDS (Volts)
100.0
10.0
1.0
0.1
0.1
1
10
100

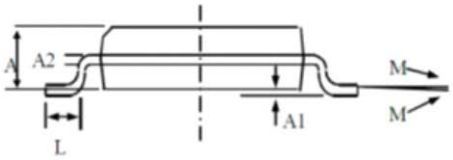
## Marking Information




| Package | SOT-23 | |
|---|---|---|
| A5 | PN code | KE8301T0U |
| Y | Year | F=2020 , G=2021, …… |
| WW | Weeks | Ex. 2020 3/2=10week, 4/6=15week |
| S | Serial | Serial No. |

## Package Outline : SOT-23




| SYMBOLS | Millimeters | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | 0.80 | 1.00 | 1.20 |
| A1 | 0.00 | – | 0.10 |
| A2 | 0.05 | – | 0.20 |
| D1 | 0.30 | 0.40 | 0.50 |
| e | 1.80 | 1.90 | 2.00 |
| D | 2.80 | 2.90 | 3.10 |
| E | 2.10 | 2.40 | 2.70 |
| E1 | 1.20 | 1.30 | 1.40 |
| M | 0° | 5° | 10° |
| L | 0.20 | – | 0.60 |

1.All Dimension Are In Millimeters.

2.Dimension Does Not Include Mold Protrusions.