

126A, 1200V N-CHANNEL SILICON CARBIDE PLANAR ENHANCEMENT POWER MOSFET

DESCRIPTION

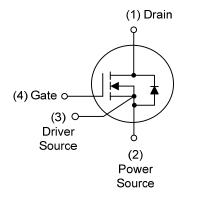
SiC The material can achieve high voltage with most carrier devices (MOSFET) with fast device structure characteristics, so it can realize the three characteristics of "high voltage", "low on resistance" and "high frequency" at the same time.

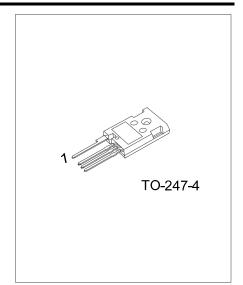
It is widely used in electric vehicle charger, industrial equipment power supply, efficient power regulator inverter and rectification part and other uses.

FEATURES

- * $R_{DS(ON)} \le 18 \text{ m}\Omega @ V_{GS}=18V, I_D=80A$
- * High Blocking Voltage
- * High Frequency Operation
- * Low on-resistance
- * Fast intrinsic diode with low reverse recovery
- * 100% avalanche tested

SYMBOL



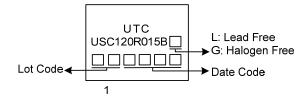


Power MOSFET

ORDERING INFORMATION

| Ordering Number | | Dookogo | Pin Assignment | | | | Deaking | |
|--|--|----------|----------------|---|-------|---|---------|--|
| Lead Free | Halogen Free | Package | 1 | 2 | 3 | 4 | Packing | |
| USC120R015BL-T474-T | USC120R015BG-T474-T | TO-247-4 | D | S | S S G | | Tube | |
| Note: Pin Assignment: D: Drain S: Source G: Gate | | | | | | | | |
| USC120R015BG-T474- | (1) T: Tube (2) T474: TO-247-4 (3) G: Halogen Free and Lead Free, L: Lead Free | | | | | | | |

MARKING





■ ABSOLUTE MAXIMUM RATINGS (Tc=25°C, unless otherwise specified)

| PARAMETER | | SYMBOL | RATINGS | UNIT | |
|----------------------|--------------|---|------------|-----------|---|
| Drain-Source Voltage | | V _{DSS} | 1200 | V | |
| Gate-Source Voltage | Dynamic | Dynamic Static | | -10 / +23 | V |
| | Static | | | -4 / +18 | V |
| Drain Current | Cartinuaua | V _{GS} =18A T _C =25°C | ID | 126 | А |
| | Continuous | V _{GS} =18A T _C =100°C | | 90 | А |
| | Pulsed (Note | Pulsed (Note 2) | | 340 | Α |
| Power Dissipation | | PD | 484 | W | |
| Junction Temperature | | TJ | -55 ~ +175 | °C | |
| Storage Temperature | | T _{STG} | -55 ~ +175 | °C | |

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating: Pulse width limited by maximum junction temperature.

THERMAL DATA

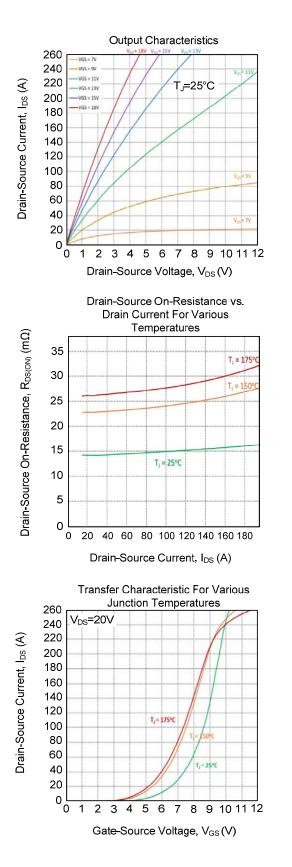
| PARAMETER | SYMBOL | RATINGS | UNIT | |
|---------------------|-----------------|---------|------|--|
| Junction to Ambient | θ _{JA} | 50 | °C/W | |
| Junction to Case | θις | 0.31 | °C/W | |

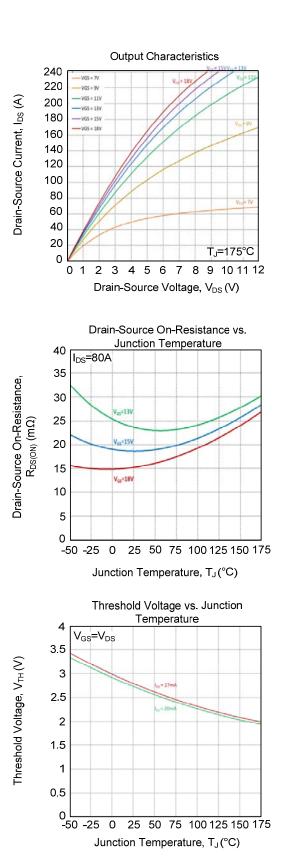
■ ELECTRICAL CHARACTERISTICS (TJ=25°C, unless otherwise specified)

| PARAMETER | SYMBOL | TEST CONDITIONS | MIN | TYP | MAX | UNIT | |
|---|---------------------|---|------|------|-----|------|--|
| OFF CHARACTERISTICS | | • | | | | | |
| Drain-Source Breakdown Voltage | BV _{DSS} | I _D =100μΑ, V _{GS} =0V | 1200 | | | V | |
| Drain-Source Leakage Current | IDSS | V _{DS} =1200V, V _{GS} =0V | 0 | 1 | 50 | μA | |
| Cate Source Lookage Current Forward | lgss | V _{GS} =+18V, V _{DS} =0V | 0 | 1 | 200 | nA | |
| Gate- Source Leakage Current Reverse | | V _{GS} =-4.0V, V _{DS} =0V | -200 | -1 | 0 | nA | |
| ON CHARACTERISTICS | | | | | | | |
| Gate Threshold Voltage | V _{GS(TH)} | V _{DS} =V _{GS} , I _D =20µA | 2.0 | 2.8 | 3.7 | V | |
| Static Drain-Source On-State Resistance | R _{DS(ON)} | V _{GS} =18V, I _D =80A | | 15 | 18 | mΩ | |
| Transconductance | g fs | V _{DS} =20V, I _D =80A | | 58 | | S | |
| DYNAMIC PARAMETERS | | | _ | | | | |
| Input Capacitance | CISS | | | 4300 | | рF | |
| Output Capacitance | Coss | V _{DS} =1000V, V _{GS} =0V, f=100KHz | | 214 | | рF | |
| Reverse Transfer Capacitance | C _{RSS} | $v_{\rm DS}$ = 1000 v, $v_{\rm GS}$ = 0 v, 1 = 100 kHz | | 19 | | рF | |
| C _{OSS} Stored Energy | Eoss | | | 122 | | μJ | |
| SWITCHING PARAMETERS | | | _ | | | | |
| Total Gate Charge | Q _G | (1 - 800)(1)(-4)(1 + 18)(-4)(1 + 18)(-4)(1 + 18)(-4)(-4)(1 + 18)(-4)(-4)(-4)(-4)(-4)(-4)(-4)(-4)(-4)(-4 | | 222 | | nC | |
| Gate to Source Charge | Q _{GS} | V _{DS} =800V, V _{GS} =-4V / +18V, I _D =80A | | 55 | | nC | |
| Gate to Drain Charge | Q _{GD} | ID-00A | | 88 | | nC | |
| Internal Gate Input Resistance | R _{G(ING)} | I _D =0A, f=1MHz | | 1.4 | | Ω | |
| SOURCE- DRAIN DIODE RATINGS AND | CHARACTE | ERISTICS | _ | | | | |
| Drain-Source Diode Forward Voltage | V _{SD} | V _{GS} =-4.0A, I _{SD} =40A | 4.1 | | | V | |
| Continuous Diode Forward Current | ls | V _{GS} =-4.0V | | | 97 | А | |
| Body Diode Reverse Recovery Time | trr | (| | 21 | | ns | |
| Body Diode Reverse Recovery Charge | Qrr | V _{GS} =-4.0V, I _{SD} =80A, V _R =800V, d _{IF} /dt=4200A/µs | | 470 | | nC | |
| Peak Reverse Recovery Current | I _{RRM} | uμ/ut=4200A/μs | | 40 | | А | |



TYPICAL CHARACTERISTICS

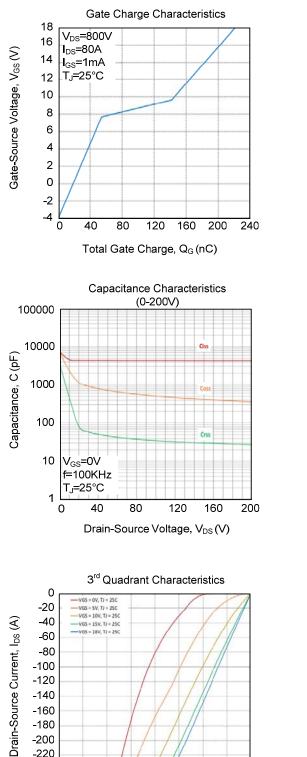




Capacitance Characteristics

(0-1200V)

TYPICAL CHARACTERISTICS (Cont.)



100000 10000 Capacitance, C (pF) 1000 100 10 V_{GS}=0V f=100KHz TJ=25°C 1 200 400 600 800 1000 1200 0 Drain-Source Voltage, V_{DS} (V) Output Capacitor Stored Energy 200 160 Stored Energy (µJ) 120 80 40 0 200 400 600 800 1000 1200 0 Drain-Source Voltage, V_{DS} (V) 3rd Quadrant Characteristics 0 -VG5 = 0V, TJ = 1750 -20 -VGS = 5V, TJ = 175C -VGS = 10V, TJ = 175C -40 Drain-Source Current, I_{DS} (A) -VGS = 15V, TJ = 1750 -60 VGS = 18V, TJ = 1750 -80 -100 -120 -140 -160 -180 -200 -220 -240 T_J=175°C -260 -7 -6 -5 -4 -3 -2 -1 -8 0

Drain-Source Voltage, V_{DS} (V)

-4 Drain-Source Voltage, VDS (V)



-100

-120

-140

-160

-180 -200

-220

-240

-260

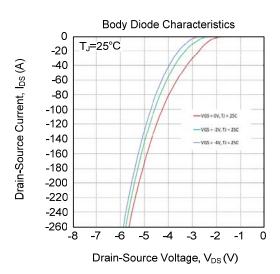
-8

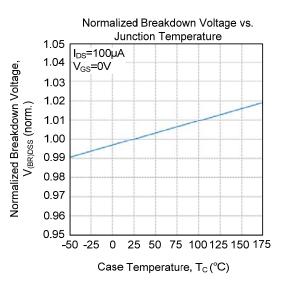
-7 -6 -5 -3 -2 -1

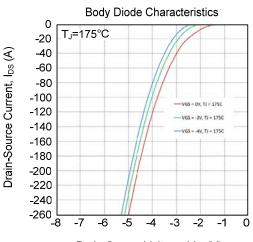
TJ=25°C

0

■ TYPICAL CHARACTERISTICS (Cont.)







Drain-Source Voltage, V_{DS}(V)

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. UTC reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

