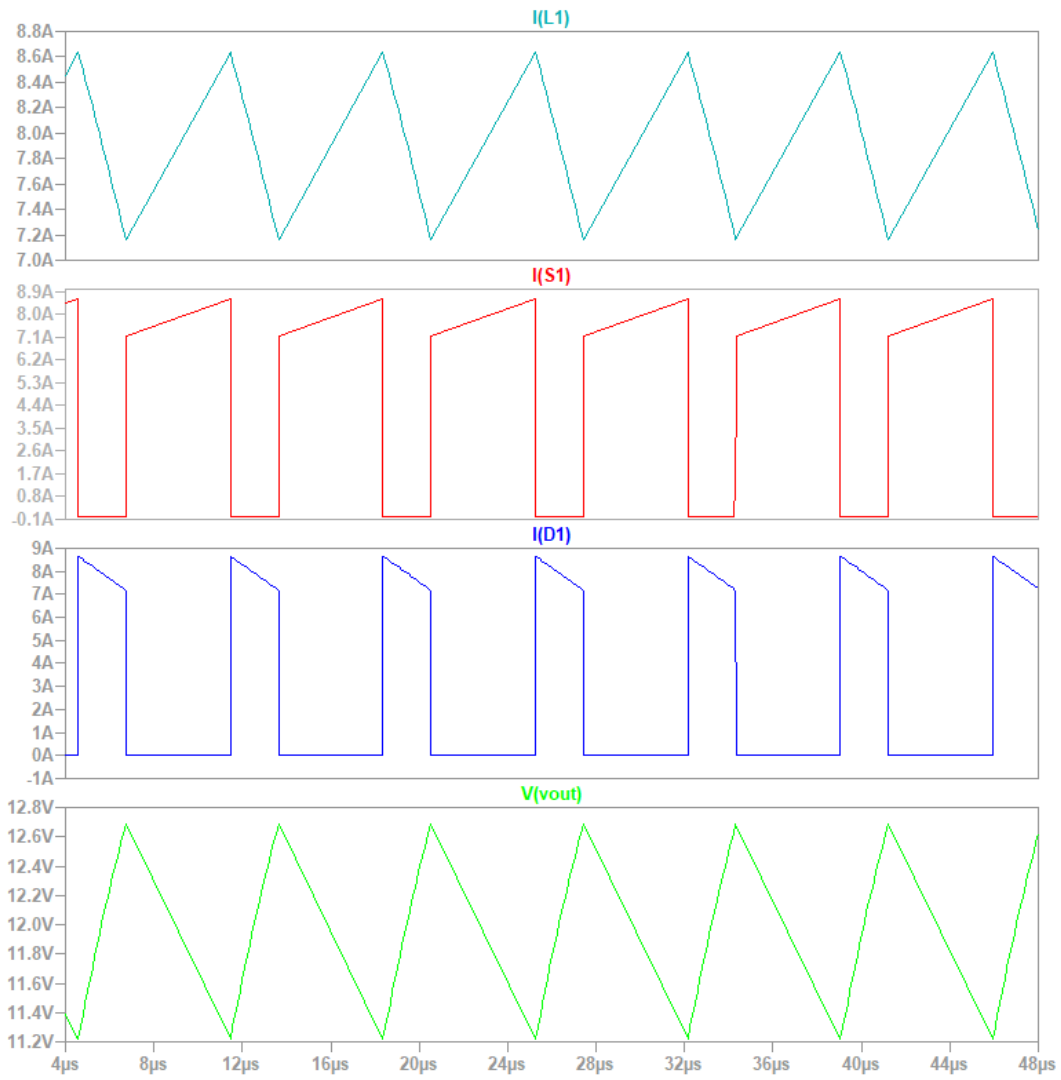


.MODEL SWIdeal SW(ROn=1u ROFF=10MEG VT=0.5 VH=0.1)

.MODEL DIDEAL D(ROn=1M ROFF=10MEG Vfwd=0)



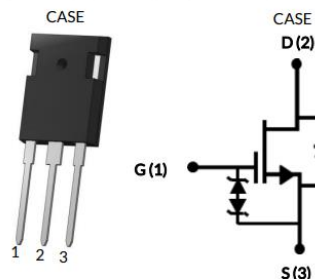
NMOS

<https://www.digikey.com/en/products/detail/qorvo/UJ4C075018K3S/13557749>

Part number: UJ4C075018K3S

DATASHEET

UJ4C075018K3S



Part Number	Package	Marking
UJ4C075018K3S	TO-247-3L	UJ4C075018K3S



750V-18mΩ SiC FET

Rev. A, October 2020

Description

The UJ4C075018K3S is a 750V, 18mΩ G4 SiC FET. It is based on a unique 'cascode' circuit configuration, in which a normally-on SiC JFET is co-packaged with a Si MOSFET to produce a normally-off SiC JFET device. The device's standard gate-drive characteristics allows for a true "drop-in replacement" to Si IGBTs, Si FETs, SiC MOSFETs or Si superjunction devices. Available in the TO-247-3L package, this device exhibits ultra-low gate charge and exceptional reverse recovery characteristics, making it ideal for switching inductive loads and any application requiring standard gate drive.

Features

- On-resistance $R_{DS(on)}$: 18mΩ (typ)
- Operating temperature: 175°C (max)
- Excellent reverse recovery: Q_{rr} = 102nC
- Low body diode V_{fSD} : 1.14V
- Low gate charge: Q_g = 37.8nC
- Threshold voltage $V_{G(th)}$: 4.8V (typ) allowing 0 to 15V drive
- Low intrinsic capacitance
- ESD protected, HBM class 2

Typical applications

- EV charging
- PV inverters
- Switch mode power supplies
- Power factor correction modules
- Motor drives
- Induction heating

Datasheet: UJ4C075018K3S

Rev. A, October 2020

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Maximum Ratings

Parameter	Symbol	Test Conditions	Value	Units
Drain-source voltage	V_{DS}		750	V
Gate-source voltage	V_{GS}	DC	-20 to +20	V
Continuous drain current ¹	I_D	$T_C = 25^\circ\text{C}$	81	A
		$T_C = 100^\circ\text{C}$	60	A
Pulsed drain current ²	I_{DM}	$T_C = 25^\circ\text{C}$	205	A
Single pulsed avalanche energy ³	E_{AS}	$L=15\text{mH}, I_{AS}=3.6\text{A}$	97.2	mJ
Power dissipation	P_{tot}	$T_C = 25^\circ\text{C}$	385	W
Maximum junction temperature	$T_{J,max}$		175	°C
Operating and storage temperature	T_J, T_{STG}		-55 to 175	°C
Max. lead temperature for soldering, 1/8" from case for 5 seconds	T_L		250	°C

1. Limited by $T_{J,max}$

2. Pulse width t_p limited by $T_{J,max}$

3. Starting $T_J = 25^\circ\text{C}$

Schottky diode

RBQ10NL45BFHHTL Schottky Diode



RBQ10NL45BFHH

Schottky Barrier Diode

(AEC-Q101 qualified) Data sheet

V_R	45	V
I_o	10	A
I_{FSM}	150	A

- Features
High reliability
Power mold type
Low I_R

- Application
Switching power supply

- Structure
Silicon epitaxial planar

● Absolute Maximum Ratings ($T_c=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Limits	Unit
Repetitive peak reverse voltage	V_{RM}	Duty ≤ 0.5	45	V
Reverse voltage	V_R	Reverse direct voltage	45	V
Average rectified forward current	I_o	60Hz half sin waveform, resistive load, $T_c=165^{\circ}\text{C}$ Max.	10	A
Peak forward surge current	I_{FSM}	60Hz half sin waveform, non-repetitive, $T_c=25^{\circ}\text{C}$	150	A
Junction temperature ⁽¹⁾	T_j	-	175	$^{\circ}\text{C}$
Storage temperature	T_{stg}	-	-55 ~ 175	$^{\circ}\text{C}$

Note⁽¹⁾ To avoid occurrence of thermal runaway, actual board is to be designed to fulfill $\phi P_d(t) \leq 1/R_{\theta JA}$.

Attention

Compared with PN junction diodes, Schottky Barrier Diode is generally high reverse current (I_R). The reverse loss of the diode might increase as temperature increasing that causes heat-up and further I_R . This phenomenon might end up the thermal destruction (thermal runaway). Therefore please give consideration to the reverse loss and the ambient temperature when using this product.

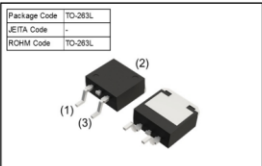
www.rohm.com

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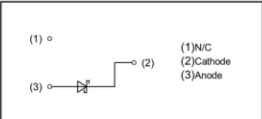
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2023/12/26_Rev003

● Outline



● Inner Circuit



● Packaging Specifications

Packing	Embossed Tape
Reel Size(mm)	330
Taping Width(mm)	24
Quantity(pcs)	1000
Taping Code	TL
Marking	BQ10NL45B

RBQ10NL45BFHH

Data sheet

● Electrical Characteristic ($T_j=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward voltage	V_F	$I_F=10\text{A}$	$T_j=25^{\circ}\text{C}$	-	-	0.62 V
			$T_j=125^{\circ}\text{C}$	-	-	0.57 V
Reverse current	I_R	$V_R=45\text{V}$	$T_j=25^{\circ}\text{C}$	-	-	100 μA
			$T_j=125^{\circ}\text{C}$	-	6.0	15 mA