

General Description

The SRE75N065FSU2D6 is a Field Stop Trench IGBT with anti-parallel diode, which offers ultra-low switching losses, high energy efficiency for switching applications such as PFC, Power Supply, Inverter, etc.

The SRE75N065FSU2D6 package is TO-247.

Features

- High Breakdown Voltage to 650V
- Advanced Trench Fieldstop technology
 - Ultra low E_{off}
 - High Ruggedness, Temperature Stability
 - Easy Parallel Switching Capability due to Positive Temperature Coefficient in $V_{CE(SAT)}$
- LOW $V_{CE(SAT)}$
- Enhanced Avalanche Capability
- Non-Automotive Qualified

Application

- Inverter
- Uninterruptible power supplies
- PFC application
- Converter with high switching frequency

Symbol

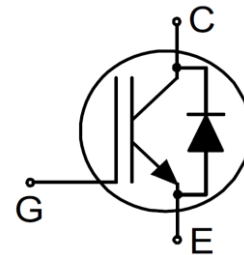
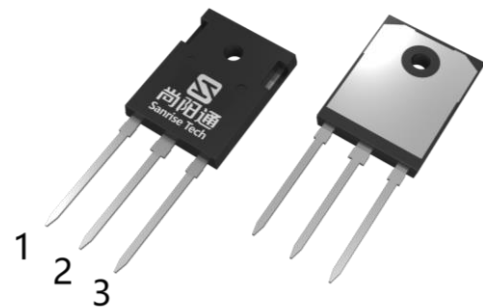


Figure 1 Symbol of SRE75N065FSU2D6

Package Type

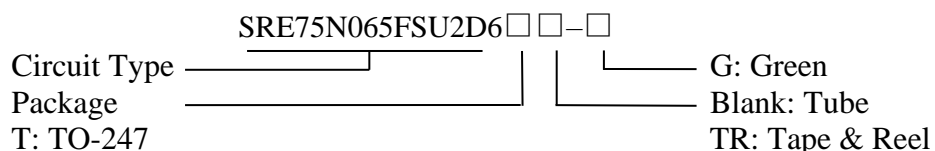


TO-247

- Pin 1- gate
- Pin 2&backside-collector
- Pin 3-emitter

Figure 2 Package Type of SRE75N065FSU2D6

Ordering Information



Package	Part Number	Marking ID	Packing Type
TO-247	SRE75N065FSU2D6T-G2	SRE75N065FSU2D6TG2	Tube

Absolute Maximum Ratings

Parameter		Symbol	Rating	Unit
Collector-emitter Voltage		V_{CES}	650	V
Gate-emitter Voltage		V_{GES}	± 20	V
Transient Gate-emitter Voltage			± 30	V
Continuous Collector Current	$T_C=25^\circ\text{C}$	I_C	100	A
	$T_C=100^\circ\text{C}$		75	
Pulsed Collector Current, Limited by T_{Jmax}		I_{CM}	300	A
Diode Continuous Collector Current	$T_C=25^\circ\text{C}$	I_F	100	A
	$T_C=100^\circ\text{C}$		75	
Diode Pulsed Current, Limited by T_{Jmax}		I_{FM}	300	A
Power Dissipation	$T_C=25^\circ\text{C}$	P_{tot}	375	W
	$T_C=100^\circ\text{C}$		188	
Operating Junction Temperature Range		T_J	$-40 \sim 175^{(1)}$	$^\circ\text{C}$
Storage Temperature Range		T_{STG}	$-55 \sim 150$	$^\circ\text{C}$
Lead Temperature (Soldering, 10 sec)		T_{LEAD}	260	$^\circ\text{C}$

Note:

1. Reliability testing conducted at $T_{Jmax}=175^\circ\text{C}$.

Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max.	Unit
IGBT Thermal Resistance, Junction-to-Case	R_{thJC}	-	-	0.40	$^\circ\text{C/W}$
Diode Thermal Resistance, Junction-to-Case	R_{thJC}	-	-	0.62	
Thermal Resistance, Junction-to-Ambient	R_{thJA}	-	-	40	

75A 650V Trench Fieldstop IGBT with anti-parallel diode SRE75N065FSU2D6
Electrical Characteristics

 T_J = 25°C, unless otherwise specified.

Parameter		Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Statistic Characteristics								
Collector-emitter Voltage	Breakdown	BV _{CES}	V _{GE} =0V, I _C =250uA	650			V	
Gate Threshold Voltage		V _{GE(th)}	V _{CE} =V _{GE} , I _C =250uA	4.6	5.1	5.8	V	
Collector-emitter saturation voltage		V _{CESat}	V _{GE} =15V, I _C =75A, T _J =25°C	1.40	1.48	1.70	V	
			T _J =125°C		1.8		V	
			T _J =150°C		1.9		V	
			T _J =175°C		2.0		V	
Zero Gate Voltage Collector Current		I _{CES}	V _{CE} =650V, V _{GE} =0V T _J =25°C		0.1	40	uA	
			T _J =175°C			1	mA	
Gate-emitter Leakage Current	Forward	I _{GESF}	V _{GE} =30V, V _{CE} =0V			100	nA	
	Reverse	I _{GESR}	V _{GE} =-30V, V _{CE} =0V			-100	nA	
Dynamic Characteristics								
Input Capacitance		C _{IES}	V _{CE} =25V, V _{GE} =0V, f=100KHz		3234		pF	
Output Capacitance		C _{OES}			241			
Reverse Transfer Capacitance		C _{RES}			45			
Gate Resistance		R _G	f=1 MHz, Open Drain		1.7		Ω	
Turn-on Delay Time		t _{d(on)}	T _J =25°C V _{CC} =400V, I _C =75A R _G =10Ω, V _{GE} =0/15V Energy losses include “tail” and diode reverse recovery		34		ns	
Rise Time		t _r			48		ns	
Turn-off Delay Time		t _{d(off)}			168		ns	
Fall Time		t _f			32		ns	
Turn-on energy		E _{on}			2.5		mJ	
Turn-off energy		E _{off}			0.7		mJ	
Total switching energy		E _{ts}			3.2		mJ	
Turn-on Delay Time		t _{d(on)}		T _J =175°C V _{CC} =400V, I _C =75A R _G =10Ω, V _{GE} =0/15V Energy losses include “tail” and diode reverse recovery		32		ns
Rise Time		t _r				63		ns
Turn-off Delay Time		t _{d(off)}				189		ns
Fall Time		t _f			41		ns	
Turn-on energy		E _{on}			2.84		mJ	
Turn-off energy		E _{off}			0.87		mJ	
Total switching energy		E _{ts}			3.71		mJ	
Gate to Emitter Charge		Q _{GE}	V _{CC} =400V, I _C =75A V _{GE} =0 to 15V			36		nC
Gate to Collector Charge		Q _{GC}			85			
Gate Charge Total		Q _G			173			

75A 650V Trench Fieldstop IGBT with anti-parallel diode SRE75N065FSU2D6

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Reverse Diode Characteristics						
Diode Forward Voltage	V_F	$I_F=37A$ $T_J=25^\circ C$		1.3	1.6	V
		$I_F=37A$ $T_J=125^\circ C$		1.24		
		$I_F=37A$ $T_J=175^\circ C$		1.1		
		$I_F=75A$ $T_J=25^\circ C$	1.40	1.65	1.90	
		$I_F=75A$ $T_J=125^\circ C$		1.55		
		$I_F=75A$ $T_J=175^\circ C$		1.51		
Reverse Recovery Time	t_{rr}	$T_J=25^\circ C$ $V_R=400V, I_F=75A$ $dI_F/dt=920A/us$		177		ns
Reverse Recovery Charge	Q_{rr}			1.8		uC
Peak Reverse Recovery Current	I_{rrm}			30		A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt			-540		A/ μs
Reverse Recovery Time	t_{rr}	$T_J=175^\circ C$ $V_R=400V, I_F=75A$ $dI_F/dt=940A/us$		404		ns
Reverse Recovery Charge	Q_{rr}			8.1		uC
Peak Reverse Recovery Current	I_{rrm}			64		A
Diode peak rate of fall of reverse recovery current during t_b	di_{rr}/dt			-240		A/ μs



Sanrise Technology Co., LTD

<http://www.sanrise-tech.com>

IMPORTANT NOTICE

Shenzhen Sanrise Technology Co., LTD. reserves the right to make changes without further notice to any products or specifications herein. Shenzhen Sanrise Technology Co., LTD. does not assume any responsibility for use of any its products for any particular purpose, nor does Shenzhen Sanrise Technology Co., LTD. assume any liability arising out of the application or use of any its products or circuits. Shenzhen Sanrise Technology Co., LTD. does not convey any license under its patent rights or other rights nor the rights of others.

Main Site:

- Headquarter

Shenzhen Sanrise Technology Co., LTD.
A1206, Skyworth building, No. 008, gaoxinnan 1st Road,
Gaoxin District, Yuehai street, Nanshan District, ShenZhen,
P.R. China

Tel: +86-755-22953335

Fax: +86-755-22916878

- Shanghai Office

Shenzhen Sanrise Technology Co., LTD.
Rm.401, Building B, No. 666, Zhangheng Road,
Zhangjiang Hi-Tech Park, Shanghai, P.R.China

Tel: +86-21-68825918