



Conversion to Cu Wire – SQS401ENW

DESCRIPTION OF CHANGE: The affected part number listed in this notification has been approved for termination. The recommended replacement part is the SQS411ENW-T1_GE3. This device offers a closely matched solution and an upgrade to the latest Cu wire material set for high volume production. The SQS411ENW-T1_GE3 uses our mature 1G P-Channel MOSFET technology from the same wafer fab and is assembled in the same facility as the SQS401EN-T1_GE3. A side by side comparison of the data sheet specifications is included with this notification.

REASON FOR CHANGE: Standardization of materials

EXPECTED INFLUENCE ON QUALITY/RELIABILITY/PERFORMANCE: None

PART NUMBERS/SERIES/FAMILIES AFFECTED: SQS401ENW-T1_GE3

VISHAY BRAND(s): Vishay Siliconix

TIME SCHEDULE:

Last Time Buy Date: Tue Dec 7, 2021

Last Time Ship Date: Wed Jun 1, 2022

SAMPLE AVAILABILITY: Qualified samples of replacement product are available immediately

PRODUCT IDENTIFICATION: SQS411ENW-T1_GE3

QUALIFICATION DATA: AEC Q101 qualification data of replacement product is available. Qualification PPAP is available now.

This PCN is considered approved, without further notification, unless we receive specific customer concerns before Sat Nov 27, 2021 or as specified by contract.

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Affected Part Number SQS401ENW
 AEC Q101 Qualified Yes
 Package Type PPAK 1212
 Process Technology 90M cells/in²
 100% Rg & UIS Tested Yes
 Datasheet Rev C / A

Absolute Maximum Ratings	Symbol	Test Conditions	Limit	Units
Drain-Source Voltage	VDS		-40	V
Gate-Source Voltage	VGS		±20	V
Continuous Drain Current	ID	TC = 25°C	-16	A
Continuous Drain Current	ID	TC = 125°C	-16	A
Continuous Source Current (Diode Conduction)	IS		-16	A
Pulsed Drain Current	IDM		-64	A
Single Pulse Avalanche Current	IAS	L = 0.1mH	-26	A
Single Pulse Avalanche Energy	EAS		18	mJ
Max Power Dissipation	PD	TC = 25°C	62.5	W
Max Power Dissipation	PD	TC = 125°C	20	W
Operating Junction Temperature	TJ		-55 to +175	°C
Thermal Resistance J-A	RthJA	PCB Mount	81	°C/W
Thermal Resistance J-C	RthJC		2.6	°C/W

Replacement Part Number SQS411ENW
 AEC Q101 Qualified Yes
 Package Type PPAK 1212
 Process Technology 1G cells/in²
 100% Rg and UIS Tested Yes
 Datasheet Rev B

Symbol	Test Conditions	Limit	Units
VDS		-40	V
VGS		±20	V
ID	TC = 25°C	-16	A
ID	TC = 125°C	-16	A
IS		-16	A
IDM		-64	A
IAS	L = 0.1mH	-19	A
EAS		18	mJ
PD	TC = 25°C	53.5	W
PD	TC = 125°C	18	W
TJ		-55 to +175	°C
RthJA	PCB Mount	81	°C/W
RthJC		2.8	°C/W

Type of Change	Risk
None	None
None	None
None	None
None	None
None	None
None	None
None	None
Lower	None, value above rated current of -16A
Lower	At max current of -16A energy capability is the same.
Lower	None, lower Rds(on) will compensate
Lower	None
None	None
None	None
None	None

Specifications Tj=25°C unless otherwise noted	Test Conditions	MIN	TYP	MAX	Units	
Drain-Source Breakdown Voltage	VDS VGS=0V, ID=250µA	-40			V	
Gate-Source Threshold Voltage	VGS(th) VDS=VGS, ID=250µA	-1.5	-2	-2.5	V	
Gate-Source Leakage	IGSS VDS=0V, VGS=±20V			±100	nA	
Zero Voltage Drain Current	IDSS VGS=0V VDS=40V, Tj=125°C			-1	µA	
	IDSS VGS=0V VDS=40V, Tj=125°C			-50	µA	
On-State Drain Current	ID(ON) VGS=10V VDS=5V	-20			A	
	ID(ON) VGS=10V ID=12A		0.020	0.029	Ω	
Drain-Source On-State Resistance	RDS(on) VGS=10V ID=12A, Tj=125°C		0.030	0.043	Ω	
	RDS(on) VGS=10V ID=12A, Tj=175°C		0.040	0.051	Ω	
	RDS(on) VGS=4.5V ID=9A		0.035	0.047	Ω	
Forward Transconductance	gfs VDS=15V, ID=7A		12		S	
Input Capacitance	Ciss		1565	1875	pF	
Output Capacitance	Coss	VGS=0V VDS=20V, f=1MHz	245	295	pF	
Reverse Transfer Capacitance	Crss		170	205	pF	
Total Gate Charge	Qg	VGS=4.5V VDS=20V, ID=9.3A	17.7	21.2	nC	
Gate-Source Charge	Qgs		5.6	6.6	nC	
Gate-Drain Charge	Qgd		8.1	9.7	nC	
Gate Resistance	Rg	f=1MHz	1.1	1.95	2.8	Ω
Turn-On Delay Time	td(on)		11	14	ns	
Rise Time	tr	VDD=20V, RL=14.3Ω, ID=1.4A, Vgen=10V, Rg=1Ω	10	13	ns	
Turn-Off Delay Time	td(off)		36.5	44	ns	
Fall Time	tf		10.2	13	ns	
Pulsed Source-Drain Current	ISM			-64	A	
Forward Voltage	VSD	I _F =8.8A VGS=0V	-0.8	-1.1	V	
Body diode reverse recovery time	trr				ns	
Body diode reverse recovery charge	Qrr	I _F =4.4A, di/dt=100A/µs			nC	
Reverse recovery fall time	ta				ns	
Reverse recovery rise time	tb				ns	
Body diode peak reverse recovery current	I _{RM} (rec)				A	

Test Conditions	MIN	TYP	MAX	Units	Type of Change	Risk	
VDS VGS=0V, ID=250µA	-40			V	None	None	
VGS(th) VDS=VGS, ID=250µA	-1.5	-2	-2.5	V	None	None	
IGSS VDS=0V, VGS=±20V			±100	nA	None	None	
IDSS VGS=0V VDS=60V			1	µA	None	None	
	IDSS VGS=0V VDS=60V, Tj=125°C		50	µA	None	None	
ID(ON) VGS=10V VDS=5V	-20			A	None	None	
RDS(on)	RDS(on) VGS=10V ID=8A	0.021	0.027	Ω	Lower	None	
	RDS(on) VGS=10V ID=8A, Tj=125°C		0.0405	Ω	Lower	None	
	RDS(on) VGS=10V ID=8A, Tj=175°C		0.048	Ω	Lower	None	
RDS(on) VGS=4.5V ID=6A	0.029	0.038	Ω	Lower	None		
gfs VDS=15V, ID=7A		23		S	Higher	None	
Ciss		2455	3191	pF	Changed	Very low. Switching speeds are not impacted	
Coss	VGS=0V VDS=25V, f=1MHz	157	205	pF	Changed	None	
Crss		187	228	pF	Changed	Very low. Switching speeds are not impacted	
Qg	VGS=10V VDS=20V, ID=2.5A	38	50	nC	At -4.5V = 18nC	None	
Qgs		6	8	nC	Changed	None	
Qgd		7	10	nC	Changed	None	
Rg	f=1MHz	2.5	4.2	6.7	Ω	Changed	Very low. Switching speeds are not impacted
td(on)		10.5	13.7	ns	Changed	None	
tr	VDD=20V, RL=14.3Ω, ID=1.4A, Vgen=10V, Rg=1Ω	3	3.9	ns	Changed	None	
td(off)		39.6	51.5	ns	Changed	None	
tf		6.4	8.4	ns	Changed	None	
ISM			-64	A	None	None	
VSD	I _F =8A VGS=0V	-0.8	-1.2	V	Changed	None	
trr				ns			
Qrr	I _F =4.4A, di/dt=100A/µs			nC			
ta				ns			
tb				ns			
I _{RM} (rec)				A			