Product Termination Notification

Product Group: SIL/Tue Feb 14, 2023/PTN-SIL-008-2023-REV-0

Conversion to Copper (Cu) Wire – SQ4840EY

For further information, please contact your regional Vishay office.

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Description of Change: The affected part number listed in this notification will be converted to a Copper wire material set. The new ordering code is SQ4840CEY-T1_GE3, which has the exact same product performance and fit as SQ4840EY. There will be no change to the wafer fab or assembly location (Note: parts with _BE3 suffix will be consolidated to single assembly location in China). There will be no changes to the parameters on the datasheet (reference: SQ4840CEY Doc #62017 Rev.B).

Classification of Change: Standardization of materials

Expected Influence on Quality/Reliability/Performance: None

Part Numbers/Series/Families Affected: SQ4840EY-T1_GE3, SQ4840EY-T1_BE3,

Vishay Brand(S): Vishay Siliconix

Time Schedule:

Last Time Buy Date: Sun Dec 17, 2023

Last Time Ship Date: Sun Jun 16, 2024

Sample Availability: Qualified samples of replacement product are available on request

Product Identification: SQ4840CEY-T1_GE3

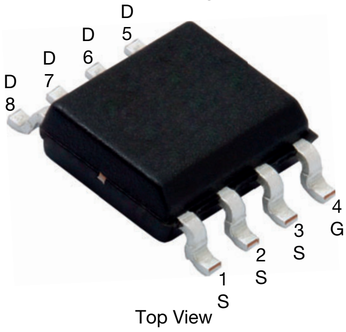
Qualification Data: AEC Q101 qualification data of replacement product is available. Qualification PPAP is available now.

This PTN is considered approved, without further notification, unless we receive specific customer concerns before Sun Dec 17, 2023 or as specified by contract.

Issued By: Lance Gurrola, business-americas@vishay.com

Automotive N-Channel 40 V (D-S) 175 °C MOSFET

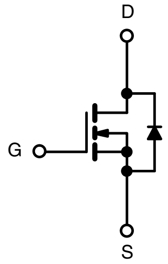
SO-8 Single



Top View

FEATURES

- TrenchFET® power MOSFET
- AEC-Q101 qualified
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



N-Channel MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	40
$R_{DS(on)}$ (Ω) at V_{GS} = 10 V	0.009
$R_{DS(on)}$ (Ω) at V_{GS} = 4.5 V	0.012
I_D (A)	20.7
Configuration	Single

ORDERING INFORMATION	
Package	SO-8
Lead (Pb)-free and halogen-free	SQ4840CEY (for detailed order number please see www.vishay.com/doc?79771)

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Drain-source voltage		V_{DS}	40	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	T_C = 25 °C	I_D	20.7	A
	T_C = 125 °C		12	
Continuous source current (diode conduction)		I_S	6.5	
Pulsed drain current [a]		I_{DM}	82	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	30	
Single pulse avalanche energy		E_{AS}	45	mJ
Maximum power dissipation	T_C = 25 °C	P_D	7.1	W
	T_C = 125 °C		2.4	
Operating junction and storage temperature range		T_J, T_{stg}	-55 to + 175	°C

THERMAL RESISTANCE RATINGS

PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-ambient	PCB mount [b]	R_{thJA}	85	°C/W
Junction-to-case (drain)		R_{thJF}	21	

Notes

a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b. When mounted on 1" square PCB (FR-4 material)

SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static							
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 , I_D = 250 μA		40	-	-	V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA		1.5	2.0	2.5	V
Gate-source leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V		-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{GS} = 0 V	V_{DS} = 40 V	-	-	1.0	μA
		V_{GS} = 0 V	V_{DS} = 40 V, T_J = 125 °C	-	-	50	
		V_{GS} = 0 V	V_{DS} = 40 V, T_J = 175 °C	-	-	150	
On-state drain current [a]	$I_{D(on)}$	V_{GS} = 10 V	V_{DS} ≥ 5 V	30	-	-	A
Drain-source on-state resistance [a]	$R_{DS(on)}$	V_{GS} = 10 V	I_D = 14 A	-	0.0062	0.009	Ω
		V_{GS} = 10 V	I_D = 14 A, T_C = 125 °C	-	-	0.014	
		V_{GS} = 10 V	I_D = 14 A, T_C = 175 °C	-	-	0.018	
		V_{GS} = 4.5 V	I_D = 12 A	-	0.0090	0.012	
Forward transconductance [b]	g_{fs}	V_{DS} = 15 V, I_D = 14 A		-	50	-	S
Dynamic[b]							
Input capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = 20 V, f = 1 MHz	-	2028	2440	pF
Output capacitance	C_{oss}			-	493	630	
Reverse transfer capacitance	C_{rss}			-	263	290	
Total gate charge [c]	Q_g	V_{GS} = 10 V	V_{DS} = 20 V, I_D = 14 A	-	44.8	62	nC
Gate-source charge [c]	Q_{gs}			-	6.3	-	
Gate-drain charge [c]	Q_{gd}			-	11.8	-	
Gate resistance	R_g	f = 1 MHz		0.2	0.45	1.6	Ω
Turn-on delay time [c]	$t_{d(on)}$	V_{DD} = 20 V, R_L = 20 Ω I_D ≅ 1 A, V_{GEN} = 10 V, R_g = 6 Ω		-	12	21	ns
Rise time [c]	t_r			-	9	17	
Turn-off delay time [c]	$t_{d(off)}$			-	51	68	
Fall time [c]	t_f			-	25	28	
Source-Drain Diode Ratings and Characteristics[b]							
Pulsed current [a]	I_{SM}			-	-	82	A
Forward voltage	V_{SD}	I_F = 2.8 A, V_{GS} = 0		-	0.71	1.1	V
Body diode reverse recovery time	t_{rr}	I_F = 2.8 A, di/dt = 100 A/μs		-	24	48	ns
Body diode reverse recovery charge	Q_{rr}			-	20	40	nC
Reverse recovery fall time	t_a			-	14	-	ns
Reverse recovery rise time	t_b			-	10	-	
Body diode peak reverse recovery current	$I_{RM(REC)}$			-	-1.6	-	A

Notes

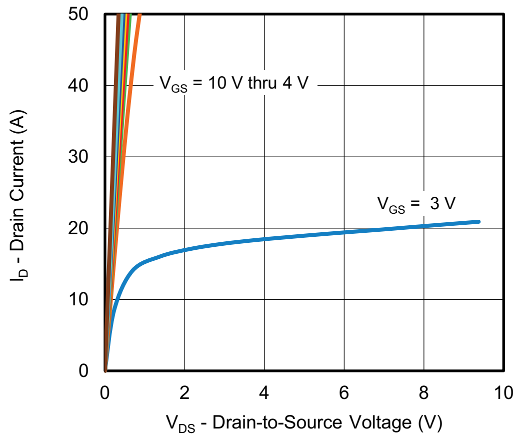
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %

b. Guaranteed by design, not subject to production testing

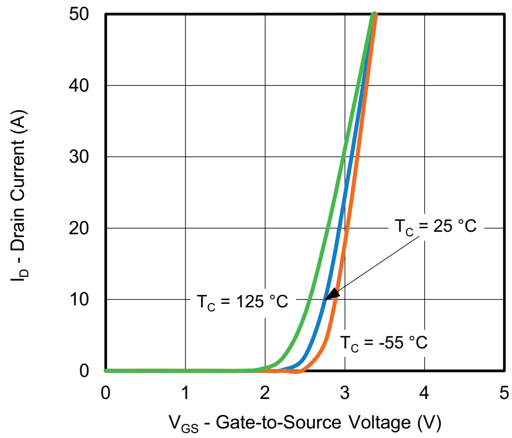
c. Independent of operating temperature

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

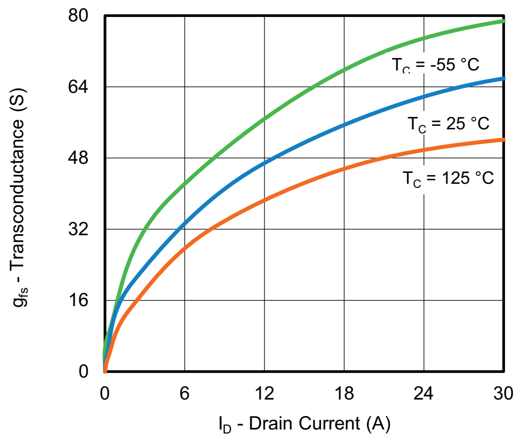
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



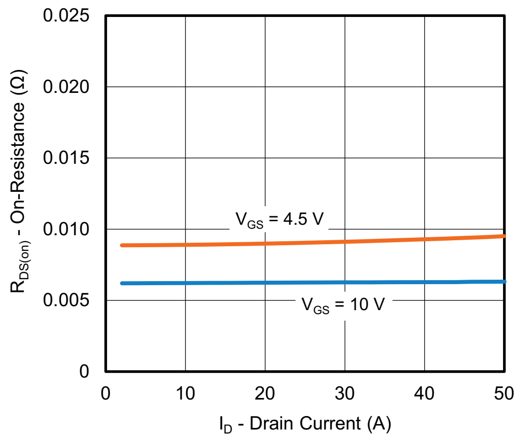
Output Characteristics



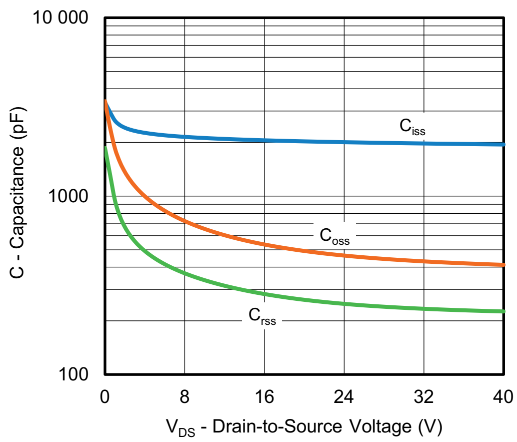
Transfer Characteristics



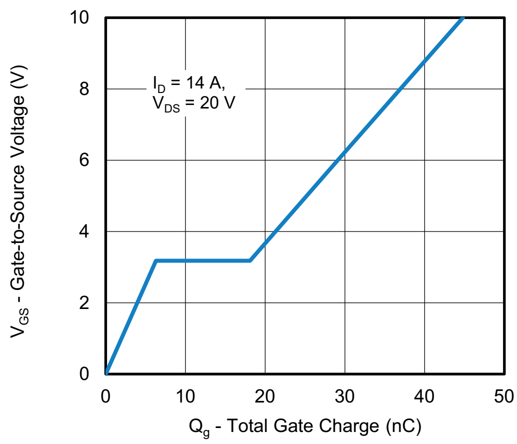
Transconductance



On-Resistance vs. Drain Current

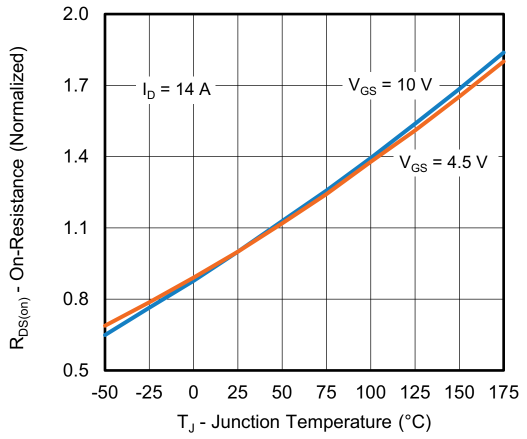


Capacitance

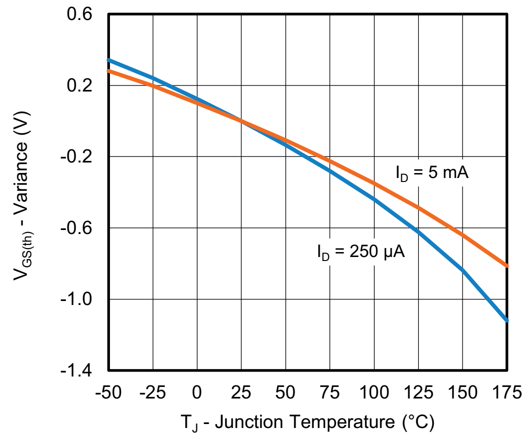


Gate Charge

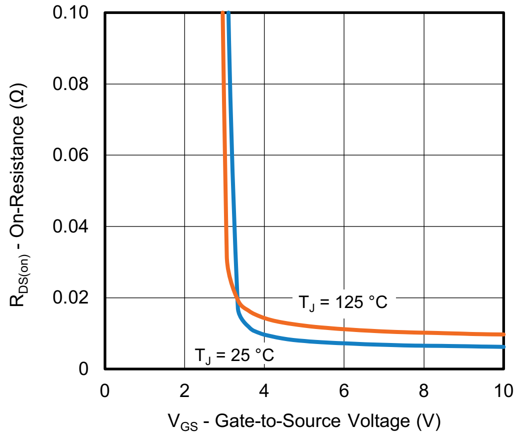
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



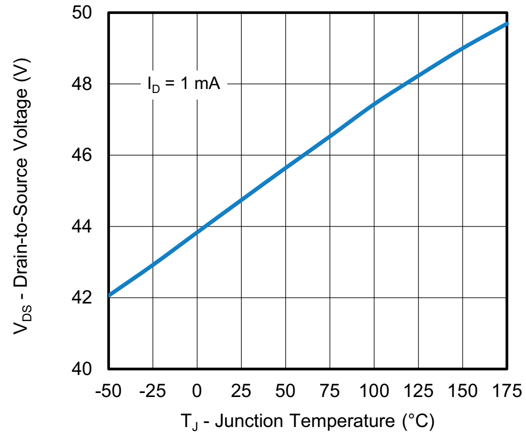
On-Resistance vs. Junction Temperature



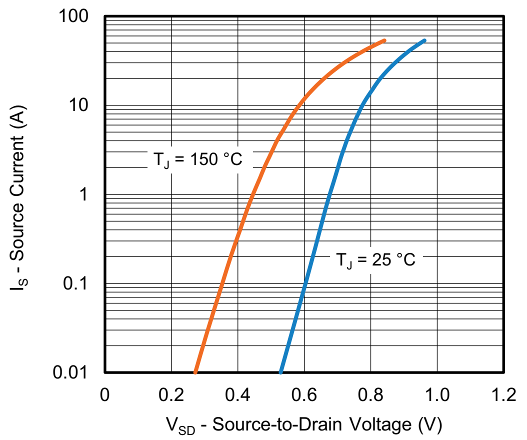
Threshold Voltage



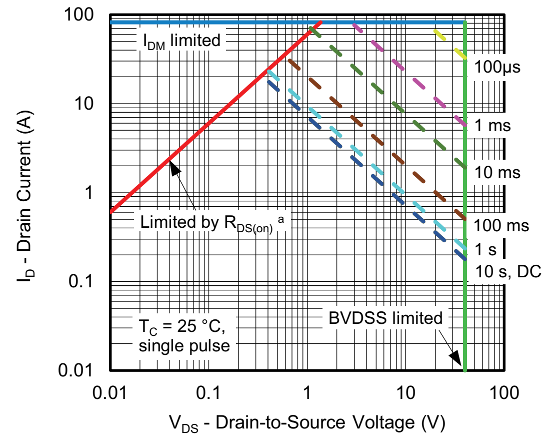
On-Resistance vs. Gate-to-Source Voltage



Drain Source Breakdown vs. Junction Temperature



Source Drain Diode Forward Voltage

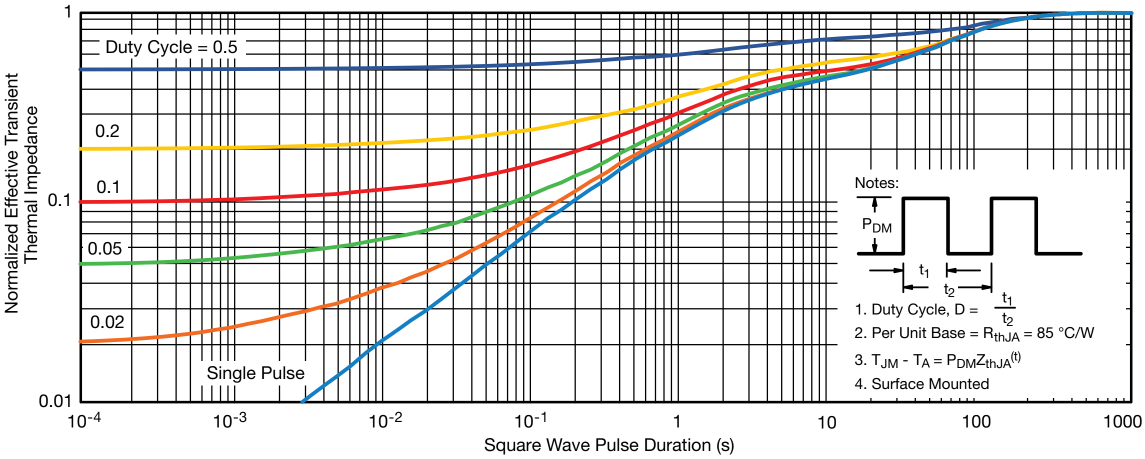


Safe Operating Area

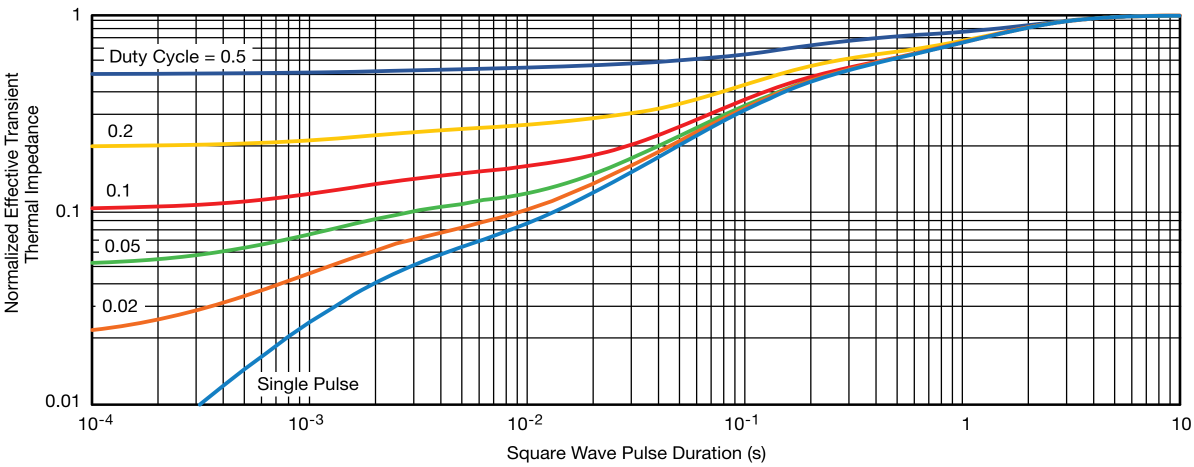
Note

a. V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

THERMAL RATINGS (T_A = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Foot

Note

- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Foot (25 °C)

  are given for general guidelines only to enable the user to get a “ball park” indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?62017.