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Product Termination Notification

Product Group: SIL/Tue Jun 13, 2023/PTN-SIL-029-2023-REV-0



Conversion to Copper (Cu) Wire – SQ3456BEV

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 SQ3456CEV-T1_GE3, which has the exact same product performance and fit as SQ3456BEV. There will be no change to the wafer fab or assembly location. There will be no changes to the parameters on the datasheet (reference: SQ3456CEV Doc # 62060 Rev.B).

Classification of Change: Standardization of materials

Expected Influence on Quality/Reliability/Performance: None

Part Numbers/Series/Families Affected: SQ3456BEV-T1_GE3

Vishay Brand(S): Vishay Siliconix

Time Schedule:

Last Time Buy Date: Wed Dec 20, 2023

Last Time Ship Date: Sun Jun 16, 2024

Sample Availability: Samples available on request

Product Identification: SQ3456CEV-T1_GE3

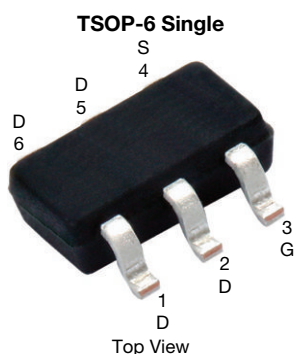
Qualification Data: Qualification data available on request

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: Vishay Siliconix, business-americas@vishay.com



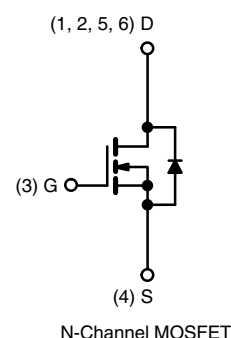
Automotive N-Channel 30 V (D-S) 175 °C MOSFET



Marking Code: 9Gxxx

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

RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY	
V_{DS} (V)	30
$R_{DS(on)}$ (Ω) at $V_{GS} = 10$ V	0.035
$R_{DS(on)}$ (Ω) at $V_{GS} = 4.5$ V	0.052
I_D (A)	7.8
Configuration	Single

ORDERING INFORMATION	
Package	TSOP-6
Lead (Pb)-free and halogen-free	SQ3456CEV (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}	30	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	$T_C = 25$ °C	I_D	7.8	A
	$T_C = 125$ °C		4.5	
Continuous source current (diode conduction)		I_S	5	
Pulsed drain current ^a		I_{DM}	31	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	10	mJ
Single pulse avalanche energy		E_{AS}	5	
Maximum power dissipation	$T_C = 25$ °C	P_D	4	W
	$T_C = 125$ °C		1.3	
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}	110	°C/W
Junction to foot (drain)		R_{thJF}	38	

Notes

- a. Pulse test; pulse width ≤ 300 μ s, 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 V, I _D = 250 μA		30	-	-	V
Gate-source threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		1.5	2.0	2.5	
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} = 30 V	-	-	1	μA
		V _{GS} = 0 V	V _{DS} = 30 V, T _J = 125 °C	-	-	50	
		V _{GS} = 0 V	V _{DS} = 30 V, T _J = 175 °C	-	-	150	
On-state drain current ^a	I _{D(on)}	V _{GS} = 10 V	V _{DS} ≥ 5 V	10	-	-	A
Drain-source on-state resistance ^a	R _{DS(on)}	V _{GS} = 10 V	I _D = 6 A	-	0.028	0.035	Ω
		V _{GS} = 4.5 V	I _D = 4.9 A	-	0.036	0.052	
		V _{GS} = 10 V	I _D = 6 A, T _J = 125 °C	-	-	0.054	
		V _{GS} = 10 V	I _D = 6 A, T _J = 175 °C	-	-	0.064	
Forward transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 5 A		-	21	-	S
Dynamic ^b							
Input capacitance	C _{iss}	V _{GS} = 0 V	V _{DS} = 15 V, f = 1 MHz	-	295	370	pF
Output capacitance	C _{oss}			-	73	85	
Reverse transfer capacitance	C _{rss}			-	25	35	
Total gate charge ^c	Q _g	V _{GS} = 10 V	V _{DS} = 15 V, I _D = 6 A	-	6	10	nC
Gate-source charge ^c	Q _{gs}			-	1.2	-	
Gate-drain charge ^c	Q _{gd}			-	1	-	
Gate resistance	R _g	f = 1 MHz		3.0	6.65	11	Ω
Turn-on delay time ^c	t _{d(on)}	V _{DD} = 15 V, R _L = 2.5 Ω I _D ≅ 6 A, V _{GEN} = 10 V, R _g = 1 Ω		-	6	9	ns
Rise time ^c	t _r			-	12	18	
Turn-off delay time ^c	t _{d(off)}			-	13	20	
Fall time ^c	t _f			-	8	12	
Source-Drain Diode Ratings and Characteristics ^b							
Pulsed current ^a	I _{SM}			-	-	31	A
Forward voltage	V _{SD}	I _F = 3 A, V _{GS} = 0 V		-	0.8	1.1	V
Body diode reverse recovery time	t _{rr}	I _F = 5 A, di/dt = 100 A/μs		-	10	20	ns
Body diode reverse recovery charge	Q _{rr}			-	5	10	nC
Reverse recovery fall time	t _a			-	7	-	ns
Reverse recovery rise time	t _b			-	3	-	
Body diode peak reverse recovery current	I _{RM(REC)}			-	-0.88	-	A

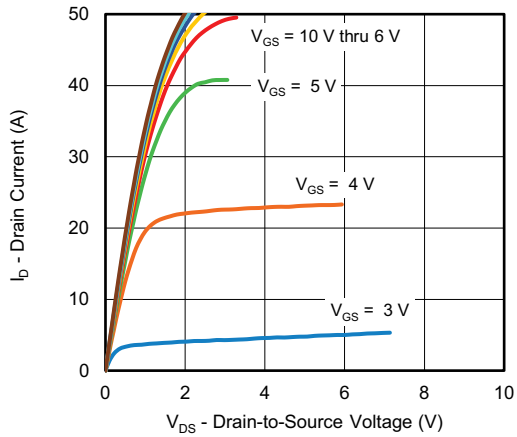
Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
b. Guaranteed by design, not subject to production testing
c. Independent of operating temperature

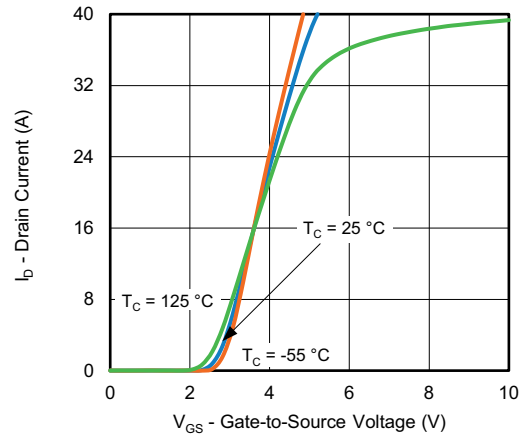
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



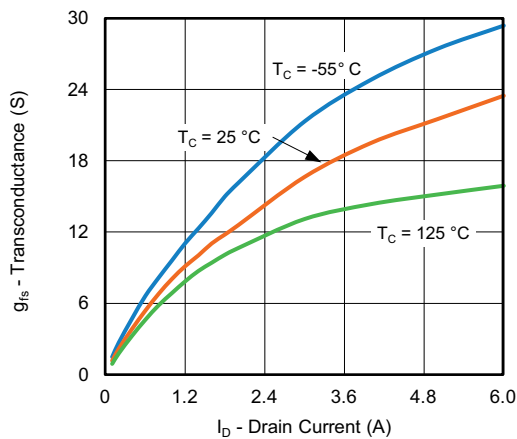
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



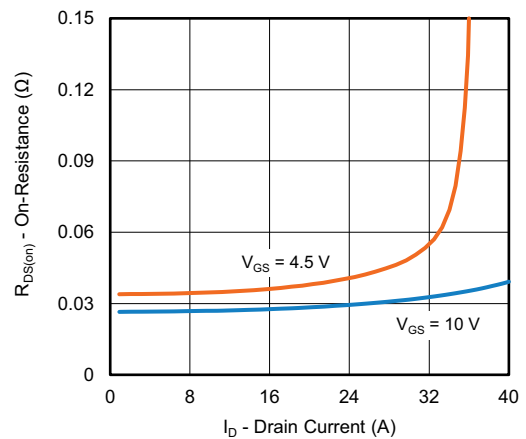
Output Characteristics



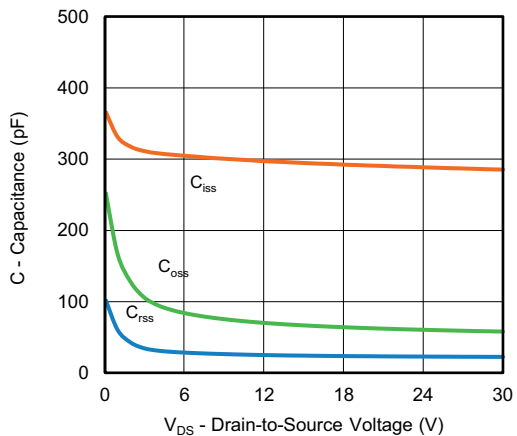
Transfer Characteristics



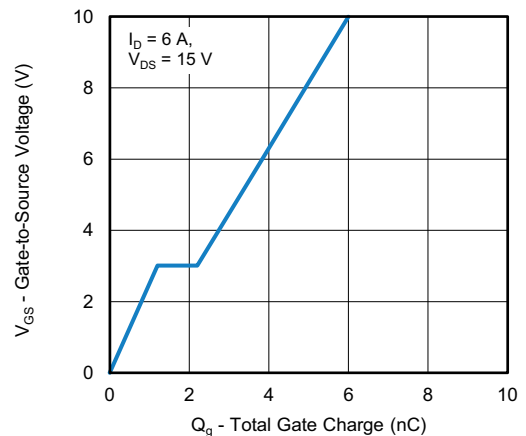
Transconductance



On-Resistance vs. Drain Current



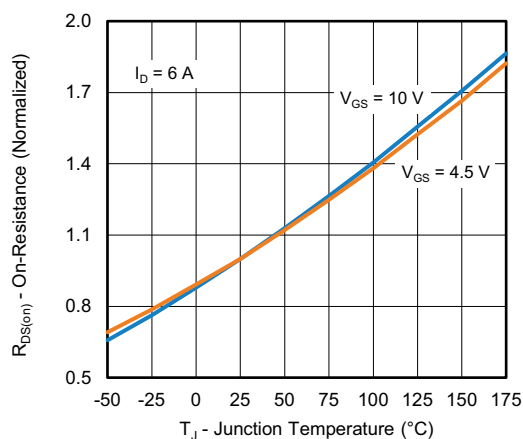
Capacitance



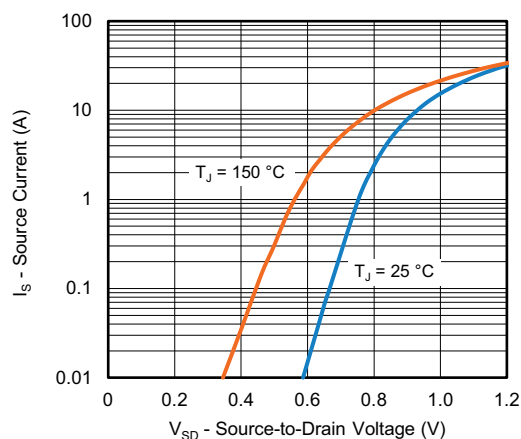
Gate Charge



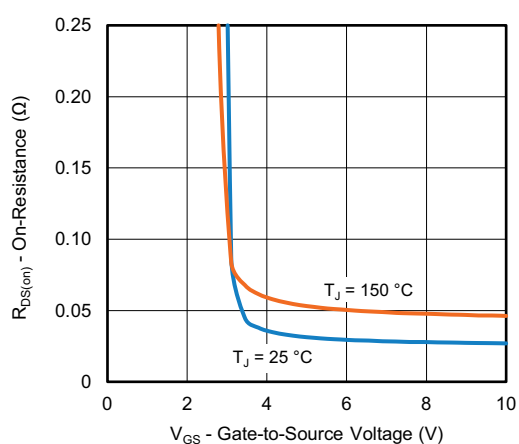
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



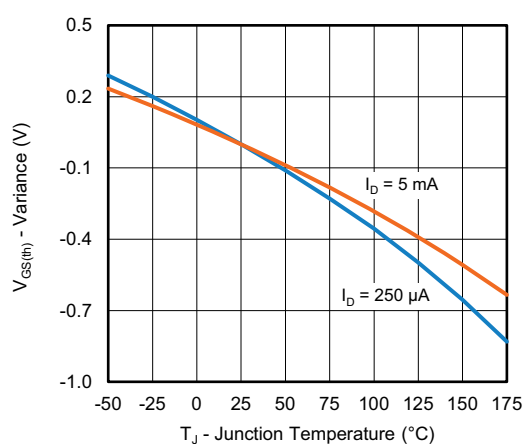
On-Resistance vs. Junction Temperature



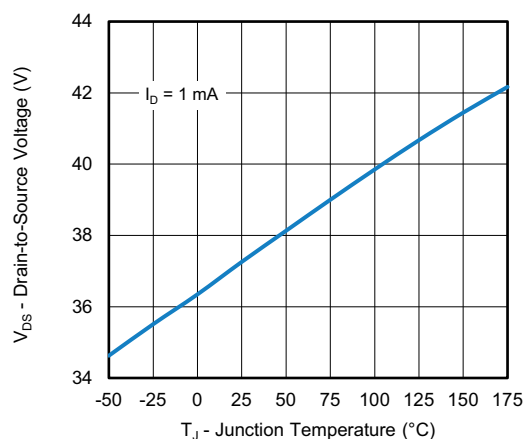
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



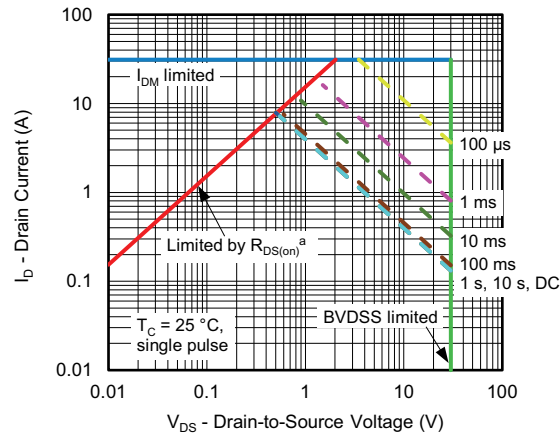
Threshold Voltage



Drain Source Breakdown vs. Junction Temperature



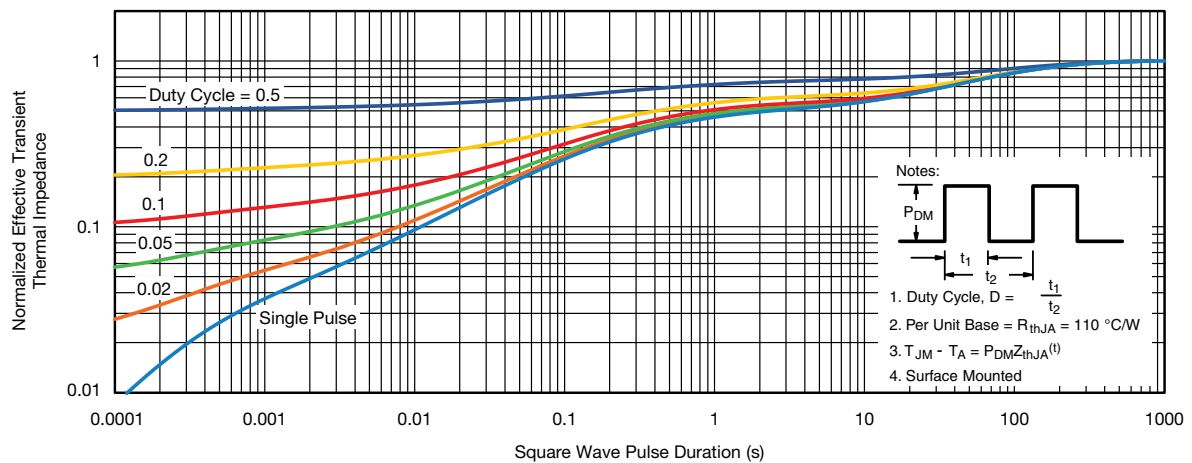
THERMAL RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



Safe Operating Area

Note

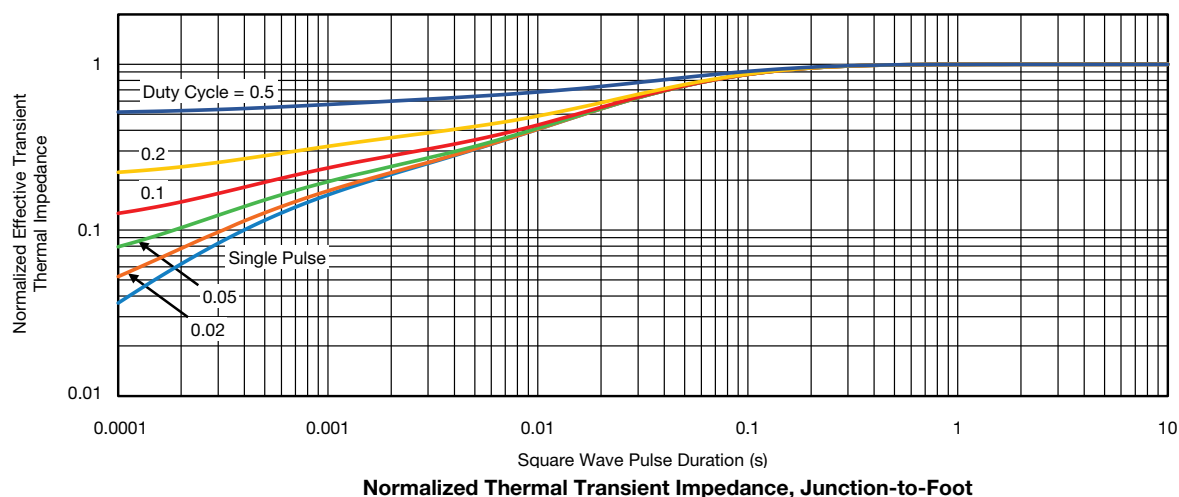
a. $V_{GS} >$ minimum V_{GS} at which $R_{DS(on)}$ is specified



Normalized Thermal Transient Impedance, Junction-to-Ambient



THERMAL RATINGS ($T_A = 25\text{ }^{\circ}\text{C}$, unless otherwise noted)



Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient ($25\text{ }^{\circ}\text{C}$)
 - Normalized Transient Thermal Impedance Junction-to-Case ($25\text{ }^{\circ}\text{C}$)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

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