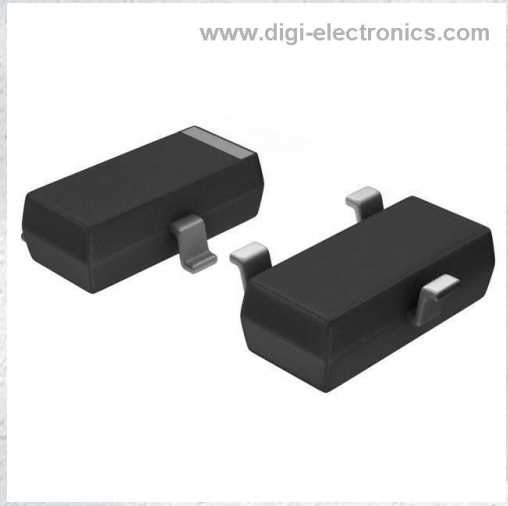
SQ2308CES-T1_GE3 Datasheet



DiGi Electronics Part Number	SQ2308CES-T1_GE3-DG
Manufacturer	Vishay Siliconix
Manufacturer Product Number	SQ2308CES-T1_GE3
Description	MOSFET N-CH 60V 2.3A SOT23
Detailed Description	N-Channel 60 V 2.3A (Tc) 2W (Tc) Surface Mount SOT-23-3 (TO-236)

https://www.DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
SQ2308CES-T1_GE3	Vishay Siliconix
Series:	Product Status:
TrenchFET®	Active
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
60 V	2.3A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
4.5V, 10V	150mOhm @ 2.3A, 10V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2.5V @ 250µA	5.3 nC @ 10 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	205 pF @ 30 V
FET Feature:	Power Dissipation (Max):
-	2W (Tc)
Operating Temperature:	Grade:
-55°C ~ 175°C (TJ)	Automotive
Qualification:	Mounting Type:
AEC-Q101	Surface Mount
Supplier Device Package:	Package / Case:
SOT-23-3 (TO-236)	TO-236-3, SC-59, SOT-23-3
Base Product Number:	
SQ2308	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
Vendor Undefined	EAR99
HTSUS:	
8541.29.0095	

VISHAY

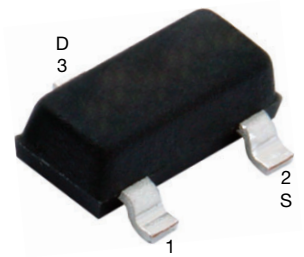
www.vishay.com

SQ2308CES

Vishay Siliconix

Automotive N-Channel 60 V (D-S) 175 °C MOSFET

SOT-23 (TO-236)



Top View

Marking Code: 8X

FEATURES

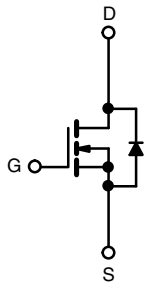
- TrenchFET® Power MOSFET
- AEC-Q101 Qualified [c]
- 100 % R_g and UIS Tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE

Pb-free

RoHS COMPLIANT

HALOGEN FREE



N-Channel MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	60
$R_{DS(on)}$ (Ω) at V_{GS} = 10 V	0.150
$R_{DS(on)}$ (Ω) at V_{GS} = 4.5 V	0.164
I_D (A)	2.3
Configuration	Single

ORDERING INFORMATION	
Package	SOT-23
Lead (Pb)-free and halogen-free	SQ2308CES (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}	60	V
Gate-source voltage		V_{GS}	± 20	
Continuous drain current	T_C = 25 °C	I_D	2.3	A
	T_C = 125 °C		1.3	
Continuous source current (diode conduction)		I_S	2.4	
Pulsed drain current [a]		I_{DM}	9	
Single pulse avalanche current	L = 0.1 mH	I_{AS}	7	
Single pulse avalanche energy		E_{AS}	2.5	mJ
Maximum power dissipation [a]	T_C = 25 °C	P_D	2	W
	T_C = 125 °C		0.6	
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}	120	°C/W
Junction-to-foot (drain)		R_{thJF}	80	

Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %
b. When mounted on 1" square PCB (FR-4 material)
c. Parametric verification ongoing

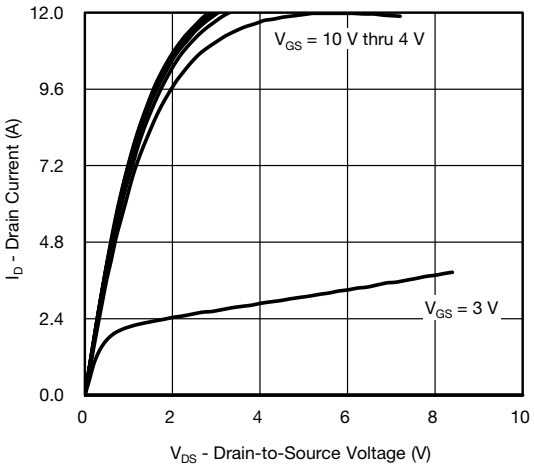
SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static							
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0, I_D = 250 µA		60	-	-	V
Gate-source threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA		1.5	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} = 60 V	-	-	1	µA
		V_{GS} = 0 V	V_{DS} = 60 V, T_J = 125 °C	-	-	50	
		V_{GS} = 0 V	V_{DS} = 60 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 = 2.3 A	-	0.125	0.150	Ω
		V_{GS} = 10 V	I_D = 2.3 A, T_J = 125 °C	-	-	0.250	
		V_{GS} = 10 V	I_D = 2.3 A, T_J = 175 °C	-	-	0.325	
		V_{GS} = 4.5 V	I_D = 2.1 A	-	0.136	0.164	
Forward Transconductance [b]	g_{fs}	V_{DS} = 15 V, I_D = 2.3 A		-	5.5	-	S
Dynamic [b]							
Input capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = 30 V, f = 1 MHz	-	164	205	pF
Output capacitance	C_{oss}			-	22	28	
Reverse transfer capacitance	C_{rss}			-	14	18	
Total gate charge [c]	Q_g	V_{GS} = 10 V	V_{DS} = 30 V, I_D = 2 A	-	3.5	5.3	nC
Gate-source charge [c]	Q_{gs}			-	0.6	-	
Gate-drain charge [c]	Q_{gd}			-	0.7	-	
Gate resistance	R_g	f = 1 MHz		2.9	5.84	9	Ω
Turn-on delay time [c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 15 Ω I_D ≅ 2 A, V_{GEN} = 10 V, R_g = 1 Ω		-	4	6	ns
Rise time [c]	t_r			-	9	13	
Turn-off delay time [c]	$t_{d(off)}$			-	12	17	
Fall time [c]	t_f			-	12	18	
Source-Drain Diode Ratings and Characteristics [b]							
Pulsed current [a]	I_{SM}			-	-	9	A
Forward voltage	V_{SD}	I_F = 1.6 A, V_{GS} = 0		-	0.85	1.2	V

Notes

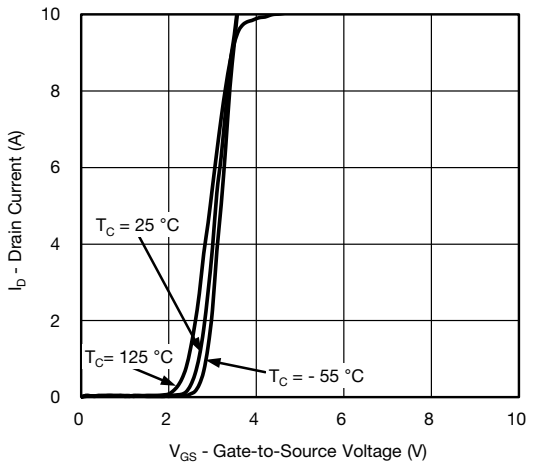
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %
b. Guaranteed by design, not subject to production testing
c. Independent of operating temperature

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.

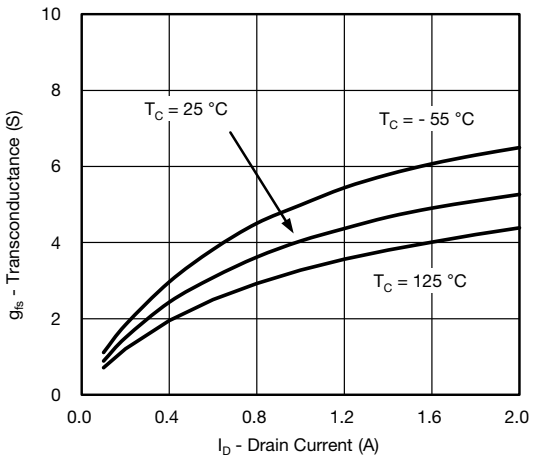
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



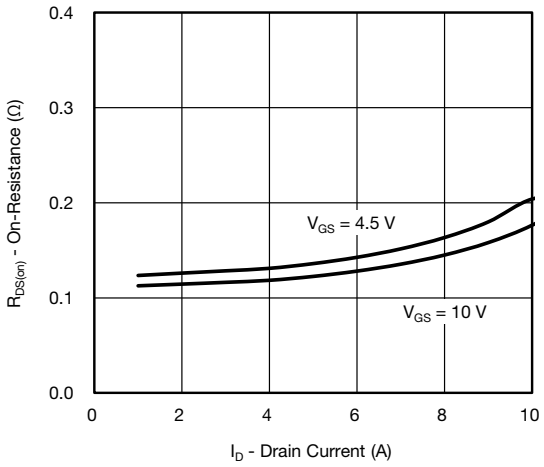
Output Characteristics



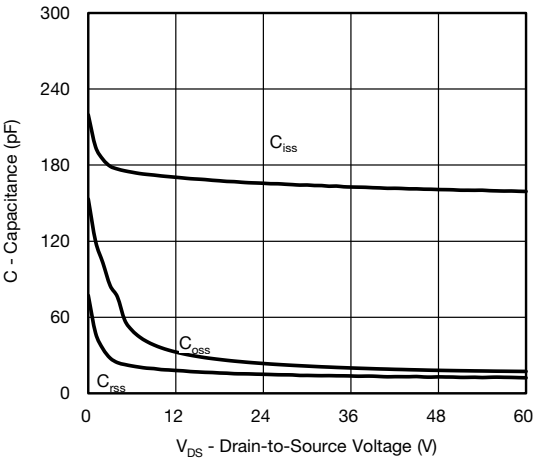
Transfer Characteristics



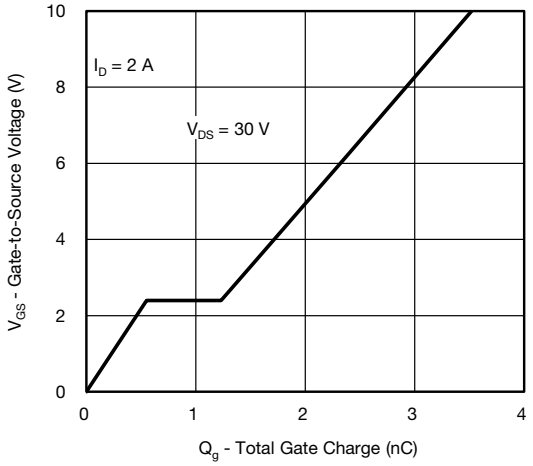
Transconductance



On-Resistance vs. Drain Current

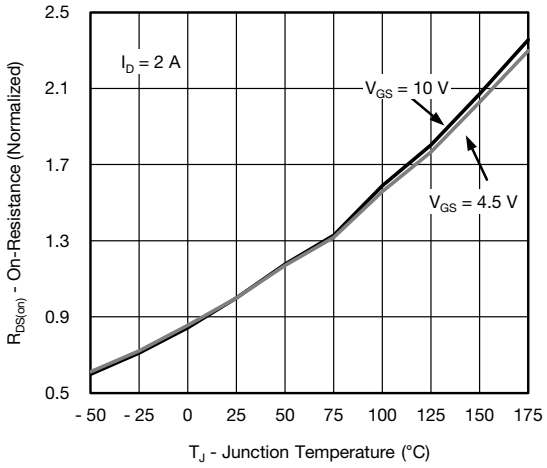


Capacitance

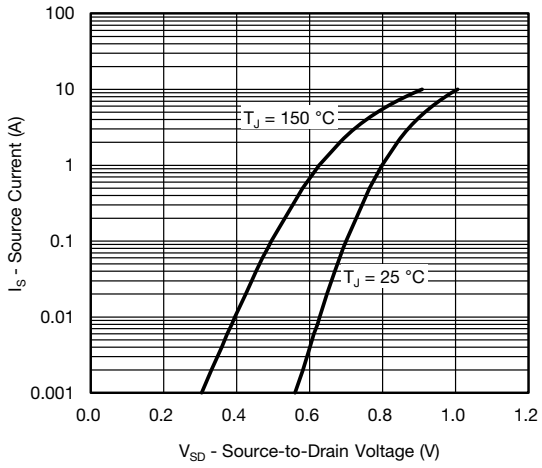


Gate Charge

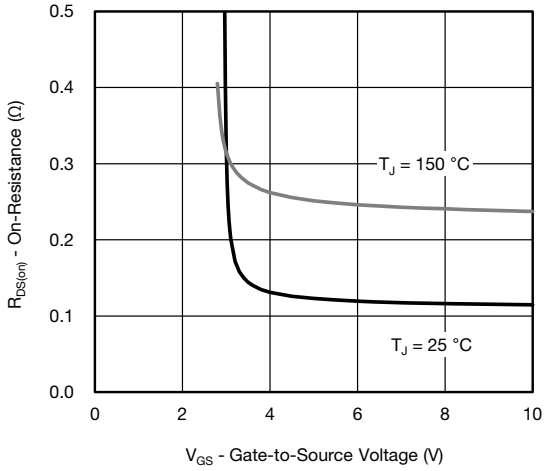
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



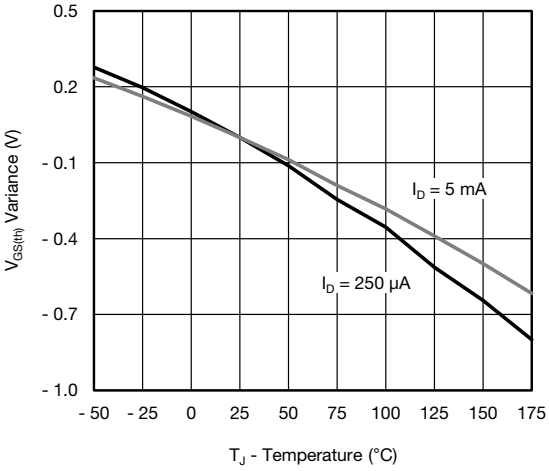
On-Resistance vs. Junction Temperature



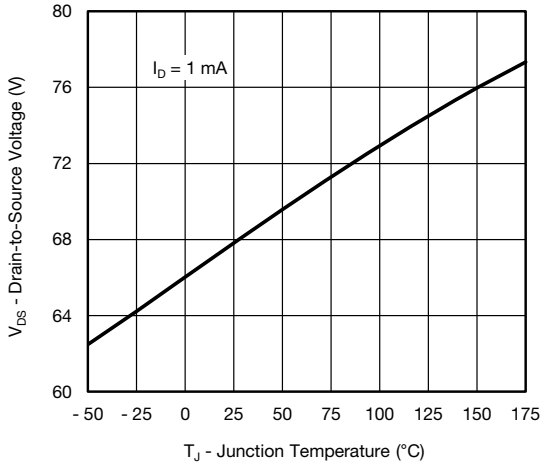
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

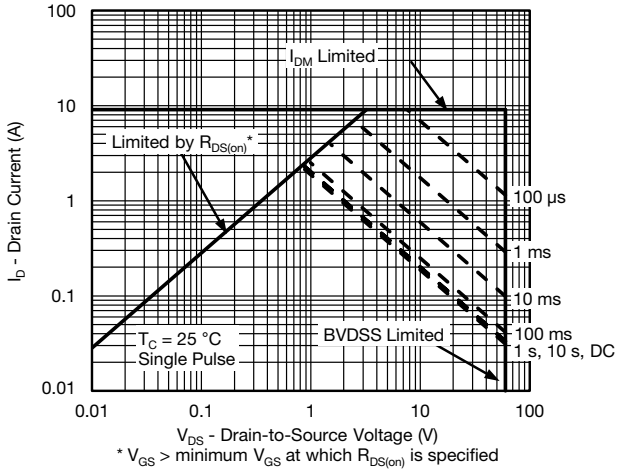


Threshold Voltage

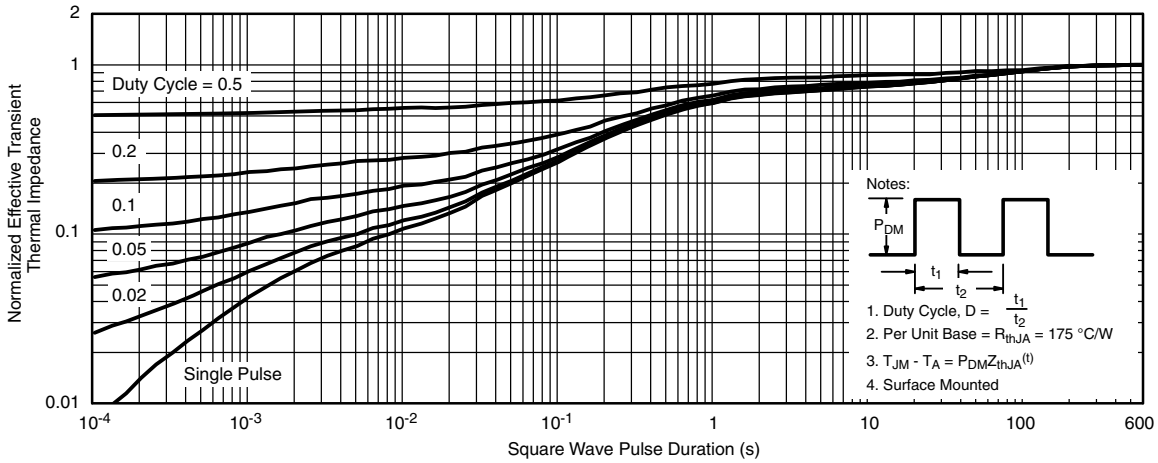


Drain Source Breakdown vs. Junction Temperature

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

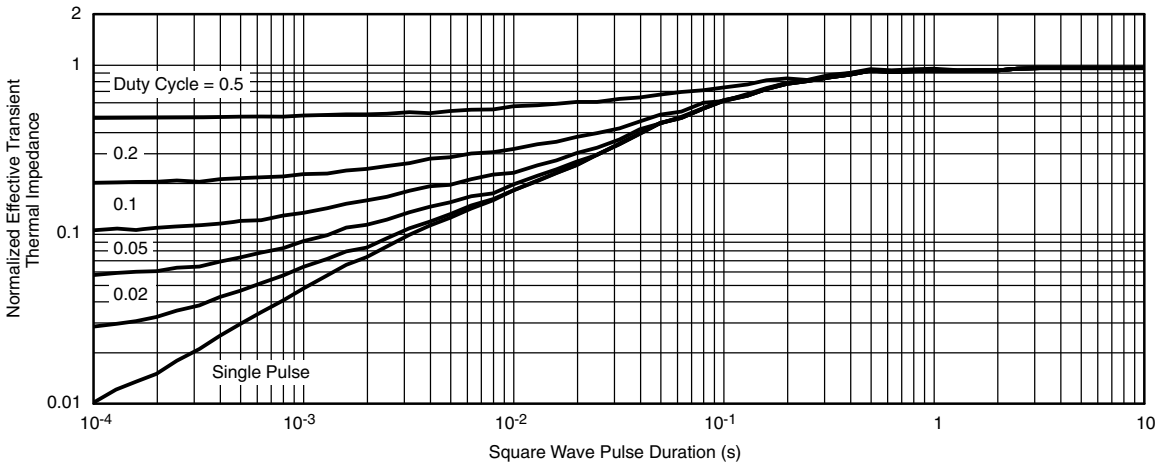


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

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



Normalized Thermal Transient Impedance, Junction-to-Foot

Note

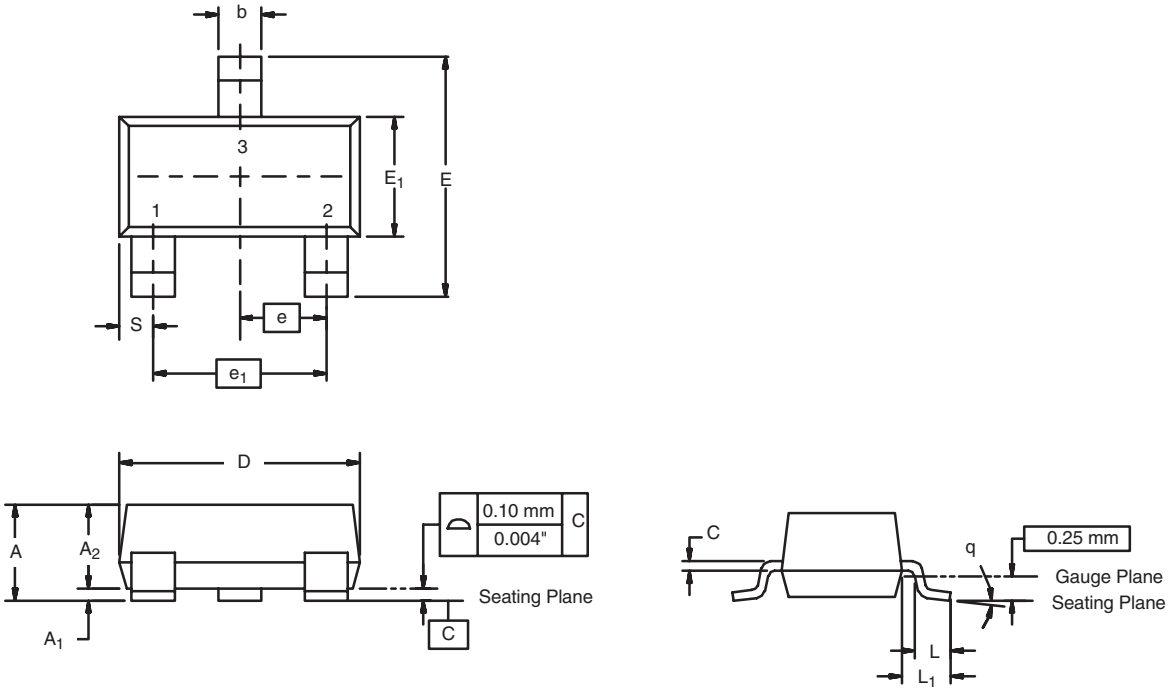
- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Foot (25 °C)

  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.

Package Information

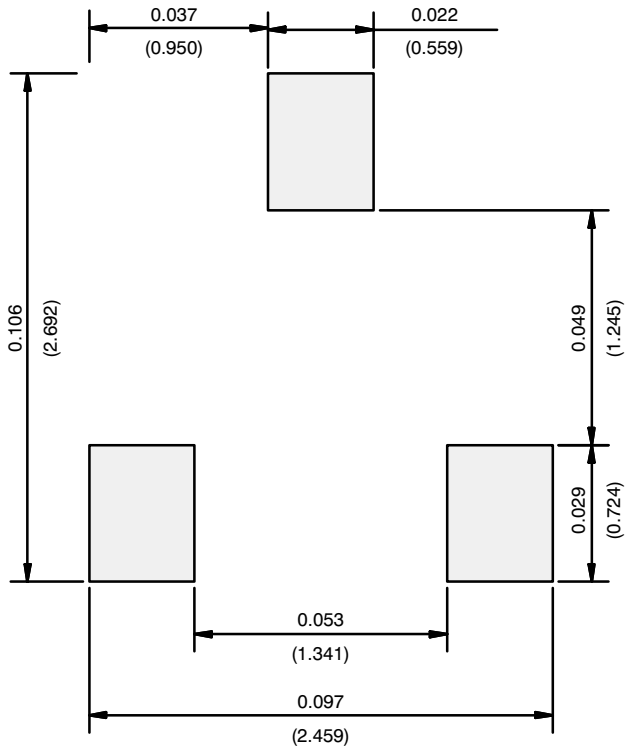
Vishay Siliconix

SOT-23 (TO-236): 3-LEAD



Dim	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	0.89	1.12	0.035	0.044
A_1	0.01	0.10	0.0004	0.004
A_2	0.88	1.02	0.0346	0.040
b	0.35	0.50	0.014	0.020
c	0.085	0.18	0.003	0.007
D	2.80	3.04	0.110	0.120
E	2.10	2.64	0.083	0.104
E_1	1.20	1.40	0.047	0.055
e	0.95 BSC		0.0374 Ref	
e_1	1.90 BSC		0.0748 Ref	
L	0.40	0.60	0.016	0.024
L_1	0.64 Ref		0.025 Ref	
S	0.50 Ref		0.020 Ref	
q	3°	8°	3°	8°
ECN: S-03946-Rev. K, 09-Jul-01 DWG: 5479				

RECOMMENDED MINIMUM PADS FOR SOT-23



Recommended Minimum Pads
Dimensions in Inches/(mm)

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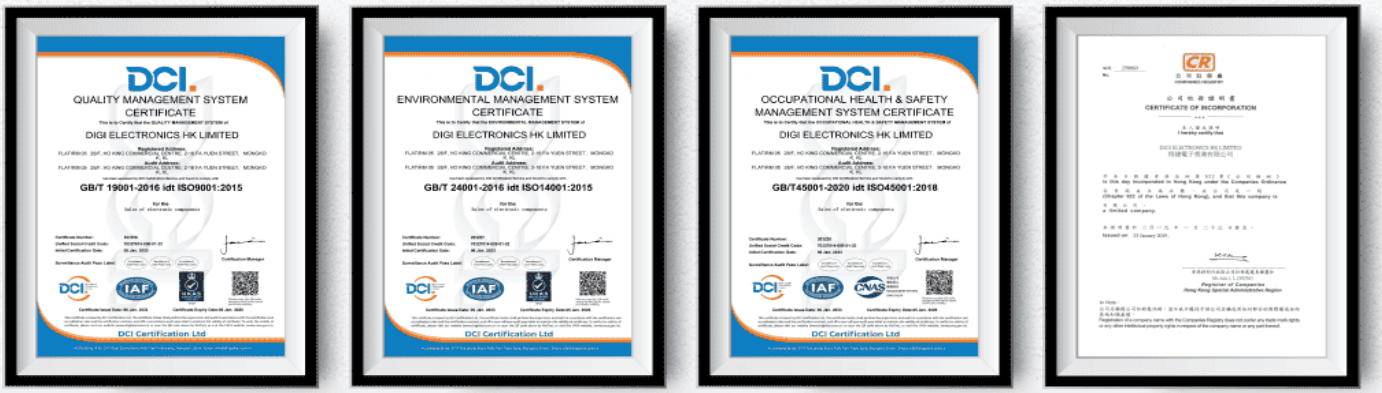

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