

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

PRODUCT SUMMARY

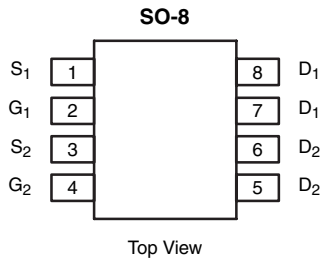
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.080 at $V_{GS} = 10$ V	± 3.7
	0.100 at $V_{GS} = 4.5$ V	± 3.4

FEATURES

- TrenchFET® Power MOSFETs
- Maximum Junction Temperature:
175 °C Rated



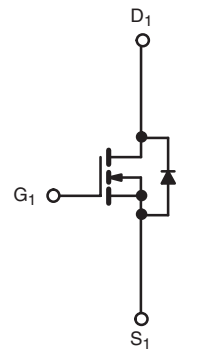
Available
RoHS*
COMPLIANT



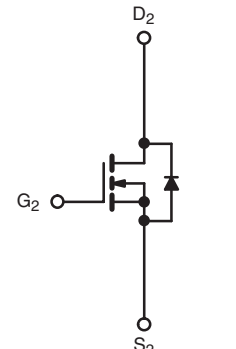
Ordering Information:

Si9945AEY-T1
SQ9945AEY-T1 (Automotive AECQ101 Qualified)

For lead (Pb)-free, add -E3 to ordering number



N-Channel MOSFET



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C) ^a	I_D	± 3.7	A
		± 3.2	
Pulsed Drain Current	I_{DM}	25	
Continuous Source Current (Diode Conduction) ^a	I_S	2	W
Maximum Power Dissipation ^a	P_D	2.4	
		1.7	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typ	Max	Unit
Junction-to-Ambient ^a	R_{thJA}		62.5	°C/W
			93	

Notes:

a. Surface Mounted on 1" x 1" FR4 Board.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>.

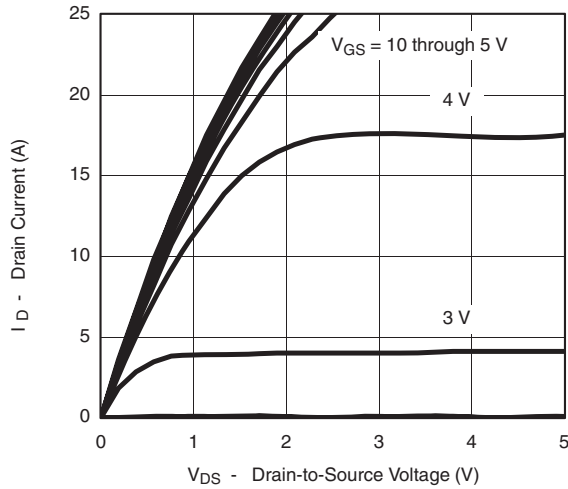
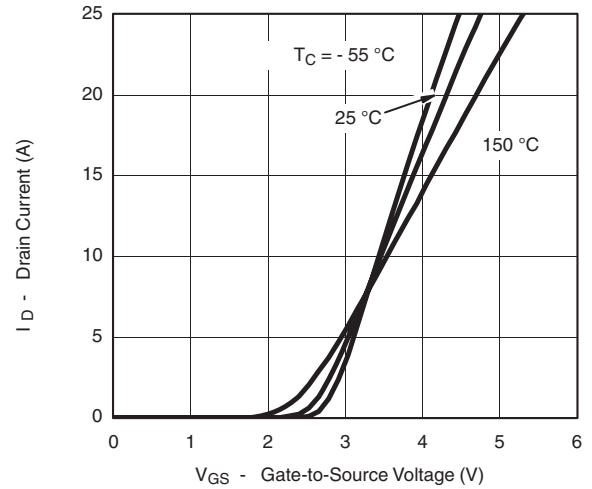
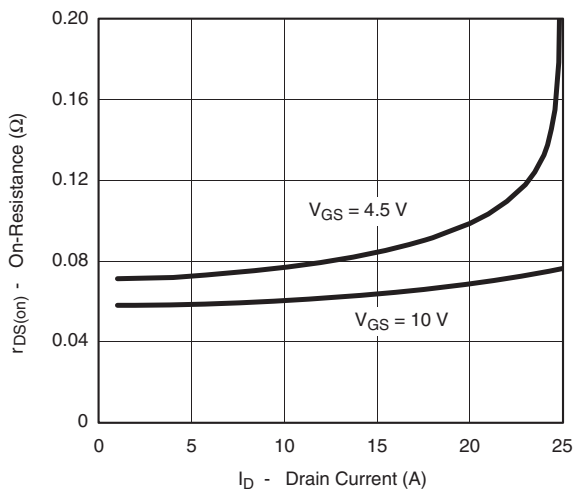
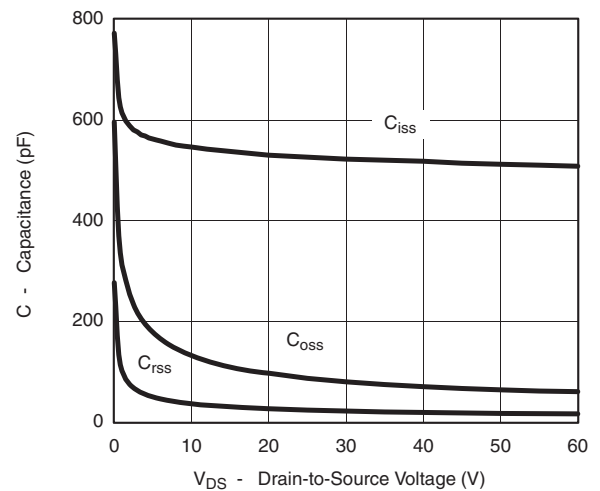
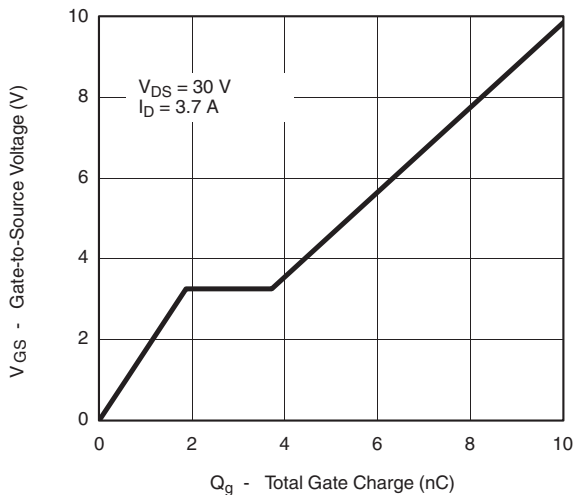
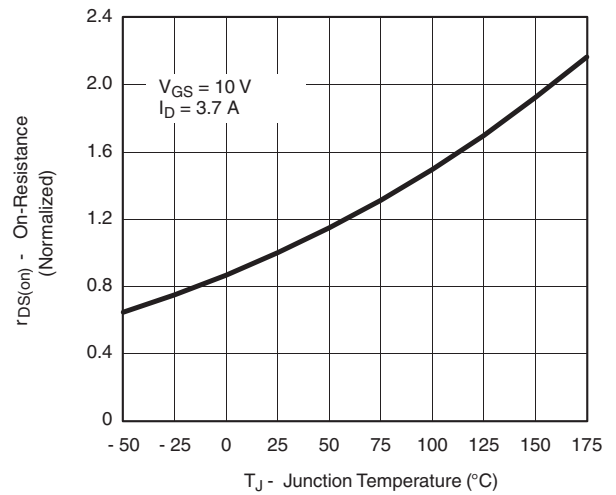
* Pb containing terminations are not RoHS compliant, exemptions may apply.

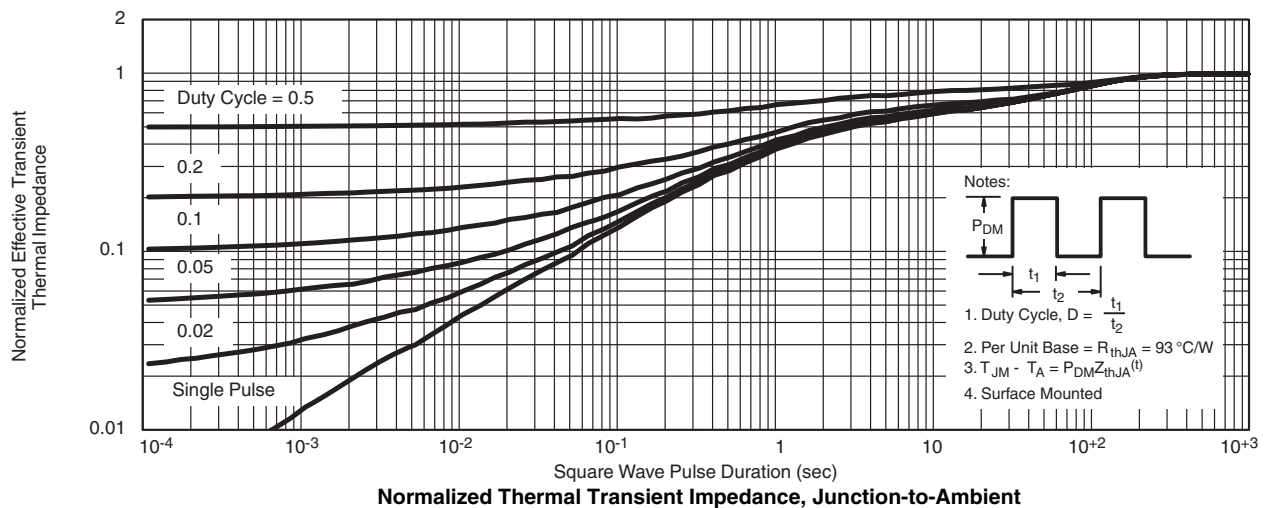
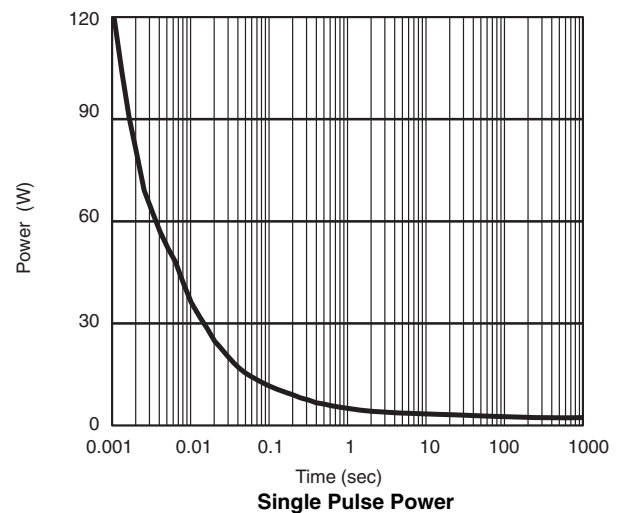
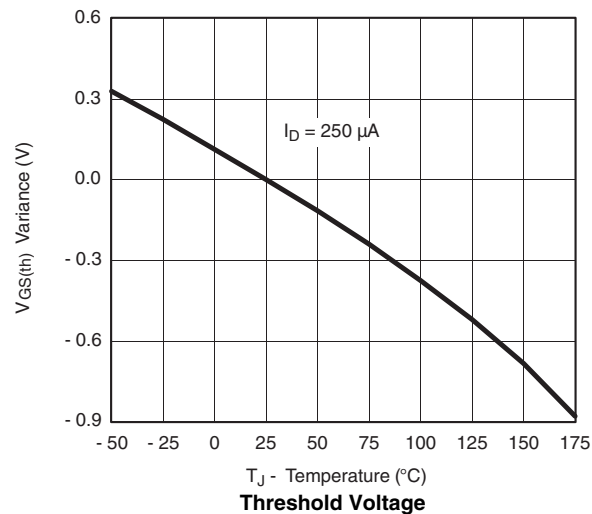
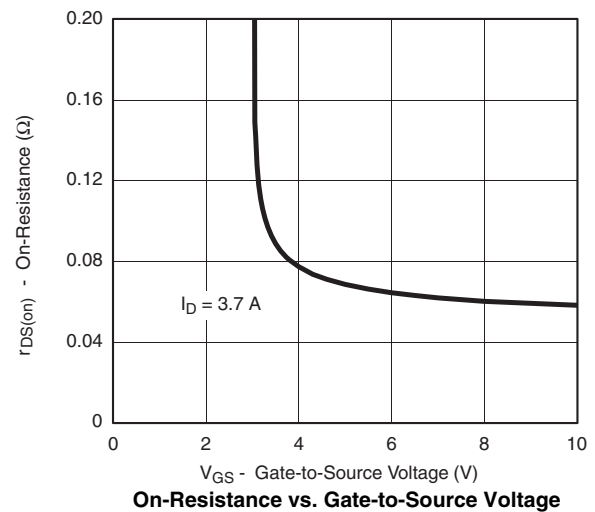
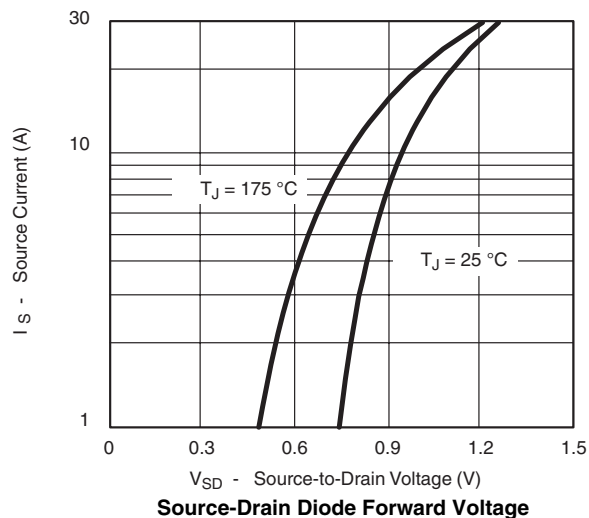
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	1.0		3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}$, $V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 55\text{ }^{\circ}\text{C}$			10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 10\text{ V}$	20			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 3.7\text{ A}$		0.06	0.080	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 3.4\text{ A}$		0.075	0.100	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 3.7\text{ A}$		11		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 2.0\text{ A}$, $V_{GS} = 0\text{ V}$			1.2	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 3.7\text{ A}$		11	20	nC
Gate-Source Charge	Q_{gs}			2		
Gate-Drain Charge	Q_{gd}			2		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 30\text{ V}$, $R_L = 30\text{ }\Omega$ $I_D \cong 1\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 6\text{ }\Omega$		9	20	ns
Rise Time	t_r			10	20	
Turn-Off Delay Time	$t_{d(off)}$			21	40	
Fall Time	t_f			8	20	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 2.0\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		45	80	

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.

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** 25 °C unless noted**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Capacitance****Gate Charge****On-Resistance vs. Junction Temperature**

TYPICAL CHARACTERISTICS 25 °C unless noted

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