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

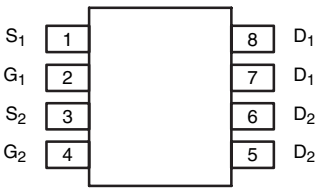
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.080 at V_{GS} = 10 V	± 3.7
	0.100 at V_{GS} = 4.5 V	± 3.4

FEATURES

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

Available
RoHS* COMPLIANT

SO-8

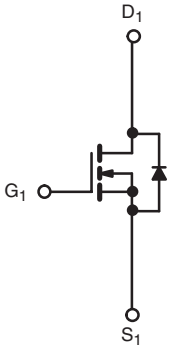


Top View

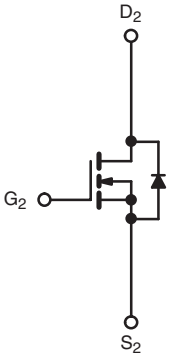
Ordering Information:

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]	T_A = 25 °C	I_D	± 3.7	A
	T_A = 70 °C		± 3.2	
Pulsed Drain Current		I_{DM}	25	
Continuous Source Current (Diode Conduction)[a]		I_S	2	
Maximum Power Dissipation[a]	T_A = 25 °C	P_D	2.4	W
	T_A = 70 °C		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]	t ≤ 10 sec	R_{thJA}		62.5	°C/W
	Steady State		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.

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SPECIFICATIONS T_J = 25 °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 µA	1.0		3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	µA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 55 °C			10	
On-State Drain Current[a]	$I_{D(on)}$	$V_{DS} \geq$ 5 V, V_{GS} = 10 V	20			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 3.7 A		0.06	0.080	Ω
		V_{GS} = 4.5 V, I_D = 3.4 A		0.075	0.100	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 3.7 A		11		S
Diode Forward Voltage[a]	V_{SD}	I_S = 2.0 A, V_{GS} = 0 V			1.2	V
Dynamic[b]						
Total Gate Charge	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 3.7 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 V, R_L = 30 Ω $I_D \cong$ 1 A, V_{GEN} = 10 V, R_G = 6 Ω		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 A, di/dt = 100 A/µs		45	80	

Notes:

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

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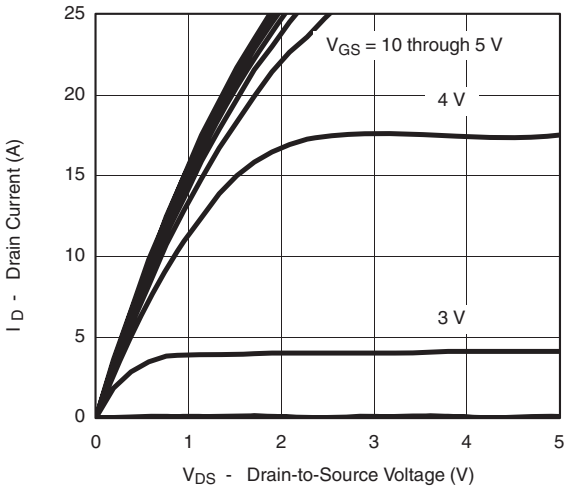
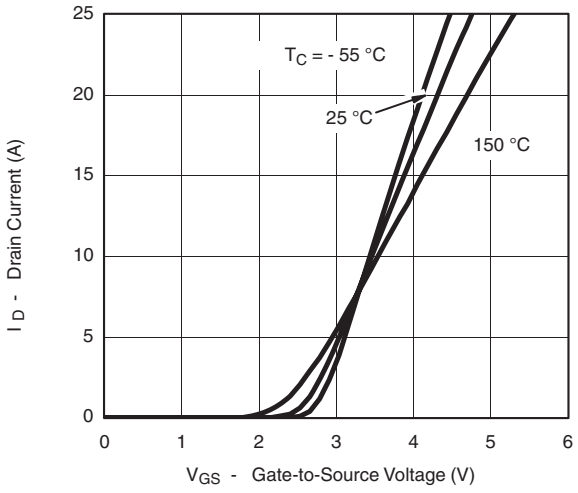
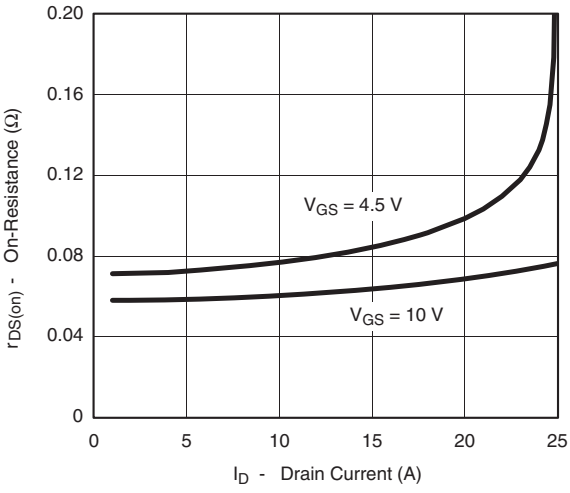
TYPICAL CHARACTERISTICS 25 °C unless noted



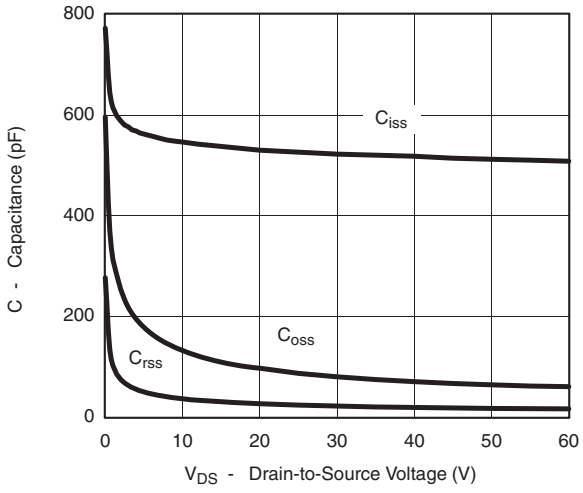
Output Characteristics



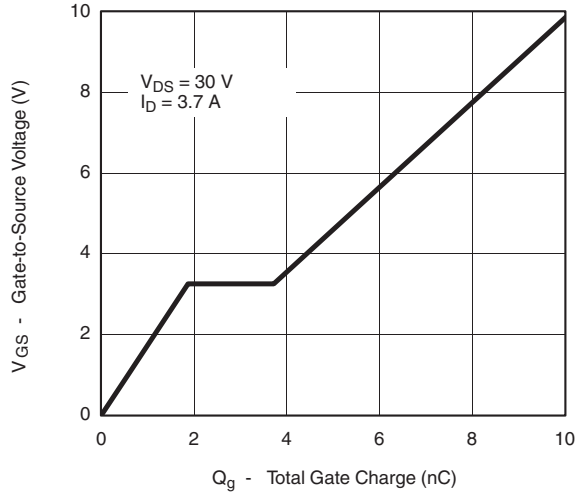
Transfer Characteristics



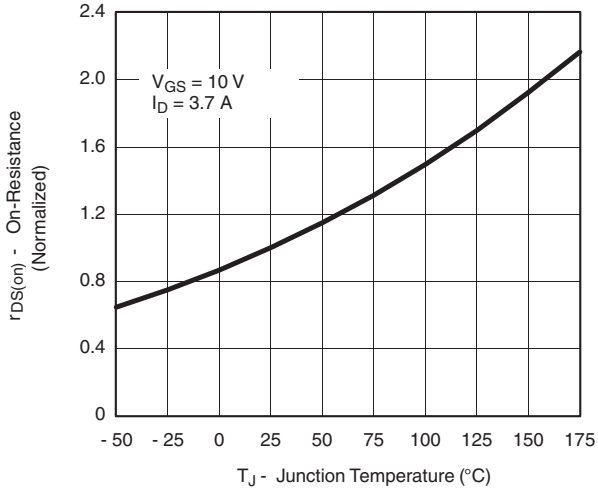
On-Resistance vs. Drain Current



Capacitance



Gate Charge



On-Resistance vs. Junction Temperature

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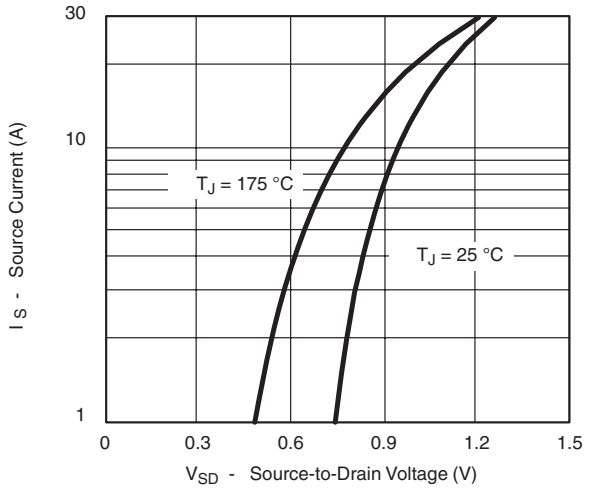
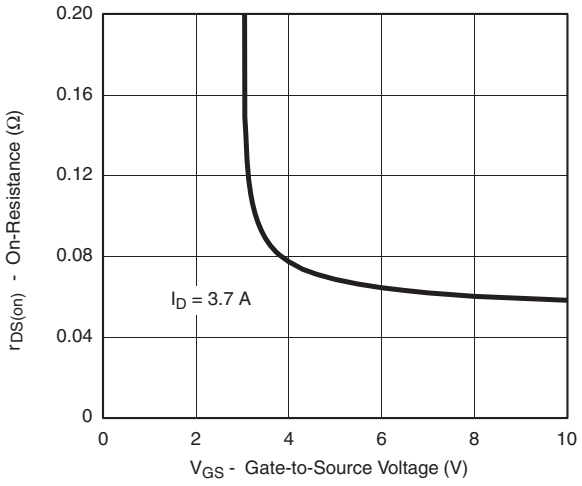
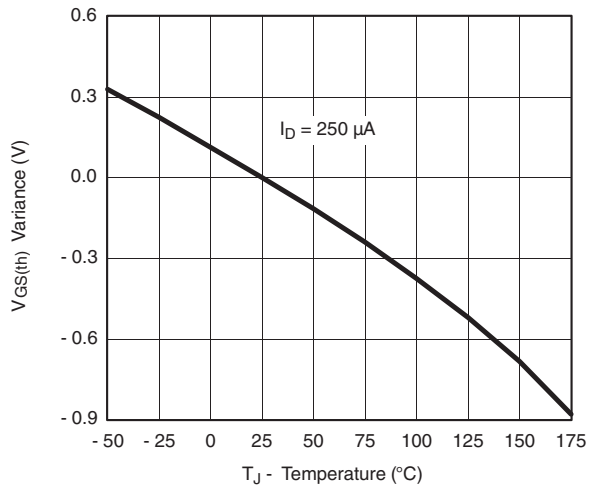


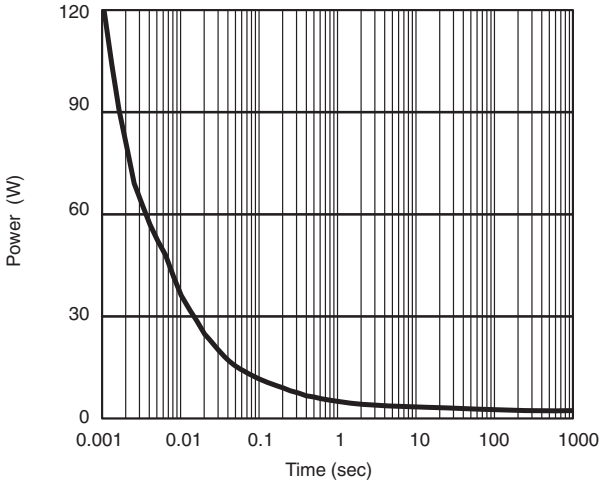
Source-Drain Diode Forward Voltage



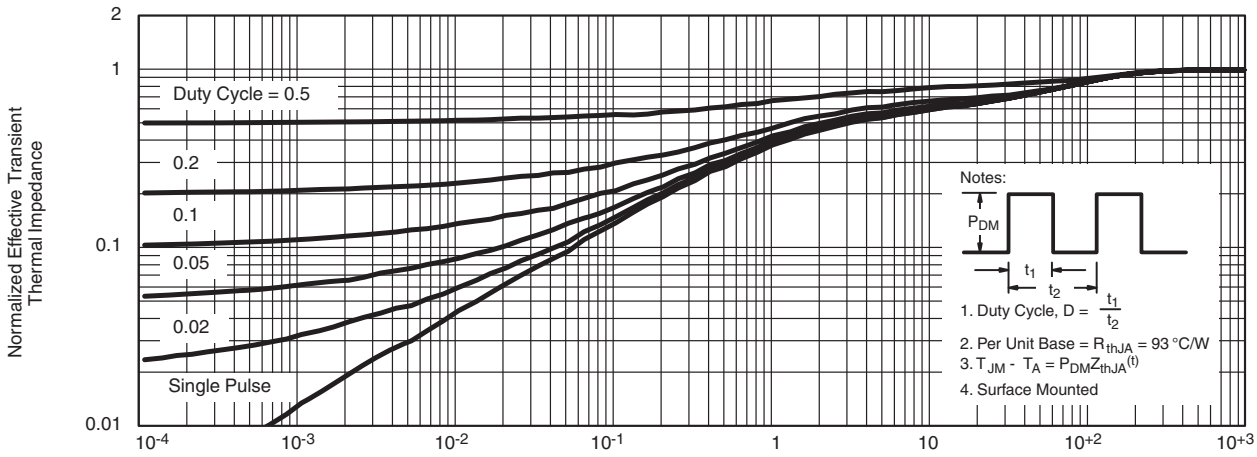
On-Resistance vs. Gate-to-Source Voltage



Threshold Voltage



Single Pulse Power



Normalized Thermal Transient Impedance, Junction-to-Ambient

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