



N-Channel 30-V (D-S) MOSFET

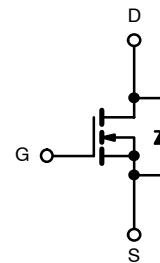
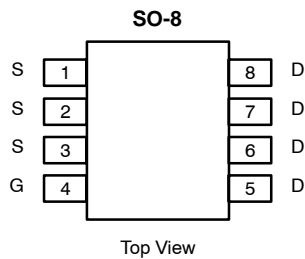
PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
30	0.0052 @ $V_{GS} = 10$ V	17	21
	0.0076 @ $V_{GS} = 4.5$ V	14	

FEATURES

- TrenchFET® Power MOSFETS
- 100% R_g Tested

APPLICATIONS

- Buck Converter
- Synchronous Rectifier
 - Secondary Rectifier



Ordering Information: Si4856ADY—E3
Si4856ADY-T1—E3 (with Tape and Reel)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^{a, b}	I_D	$T_C = 25^\circ\text{C}$	A
		$T_C = 70^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
		$T_A = 70^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	± 50	mJ
Continuous Source Current (Diode Conduction) ^{a, b}	I_S	2.7	
Pulse Source-Drain Diode Current	I_{SM}	50	
Single Pulse Avalanche Current	I_{AS}	45	
Single Pulse Avalanche Energy	E_{AS}	100	W
Maximum Power Dissipation ^a	P_D	$T_C = 25^\circ\text{C}$	
		$T_C = 70^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$	
		$T_A = 70^\circ\text{C}$	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient (MOSFET) ^a	R_{thJA}	$t \leq 10$ sec	34	41	$^\circ\text{C}/\text{W}$
		Steady State	67	80	
Maximum Junction-to-Foot (Drain)	R_{thJF}	15	19		

Notes

- a. Surface Mounted on 1" x 1" FR4 Board.
b. $t = 10$ sec

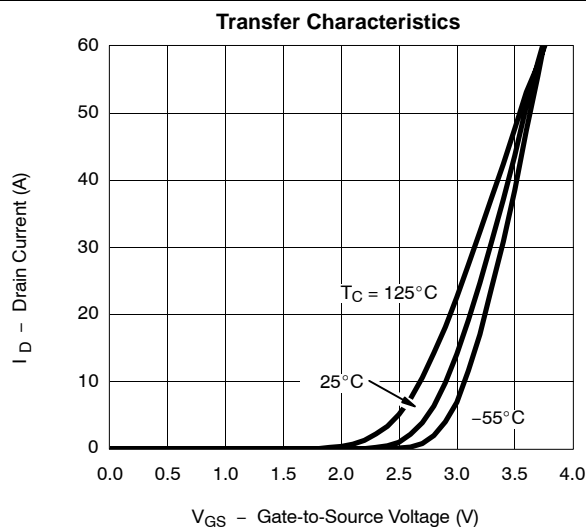
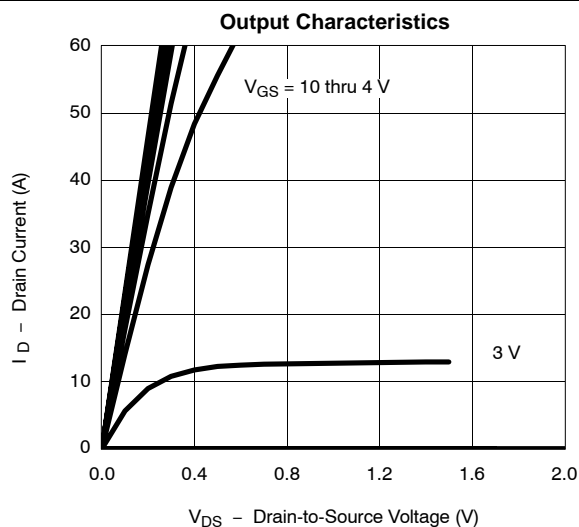
MOSFET SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1.5		2.5	V
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	30			
V _{DS} Temperature Coefficient	ΔV _{DS/TJ}	I _D = 250 μA		24		mV/°C
V _{GS(th)} Temperature Coefficient	ΔV _{GS(th)/TJ}			-6.2		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 70 °C			5	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	40			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 17 A		0.0043	0.0052	Ω
		V _{GS} = 4.5 V, I _D = 14 A		0.0063	0.0076	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 17 A		57		S
Diode Forward Voltage ^a	V _{SD}	I _S = 2.7 A, V _{GS} = 0 V		0.72	1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 17 A		21	32	nC
Gate-Source Charge	Q _{gs}			8.2		
Gate-Drain Charge	Q _{gd}			7.2		
Gate-Resistance	R _g		0.7	1.5	2.3	Ω
Turn-On Delay Time	t _{d(on)}	V _{DD} = 15 V, R _L = 15 Ω I _D ≅ 1 A, V _{GEN} = 10 V, R _g = 6 Ω		18	27	ns
Rise Time	t _r			15	23	
Turn-Off Delay Time	t _{d(off)}			57	90	
Fall Time	t _f			20	30	
Source-Drain Reverse Recovery Time	t _{rr}		I _F = 2.7 A, di/dt = 100 A/μs		40	
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 2.9 A, di/dt = 100 A/μs		36	60	nC

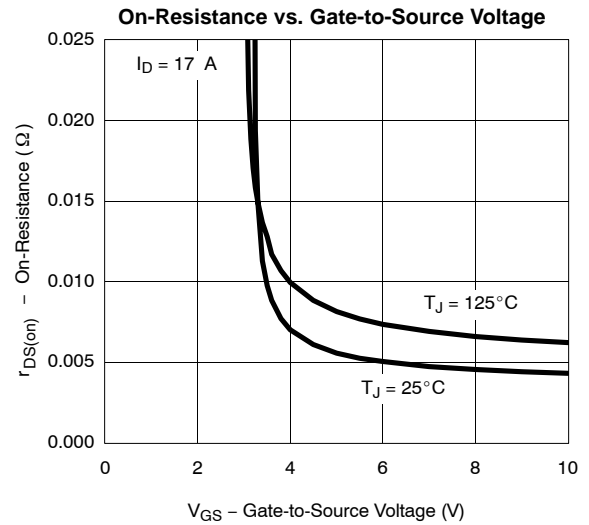
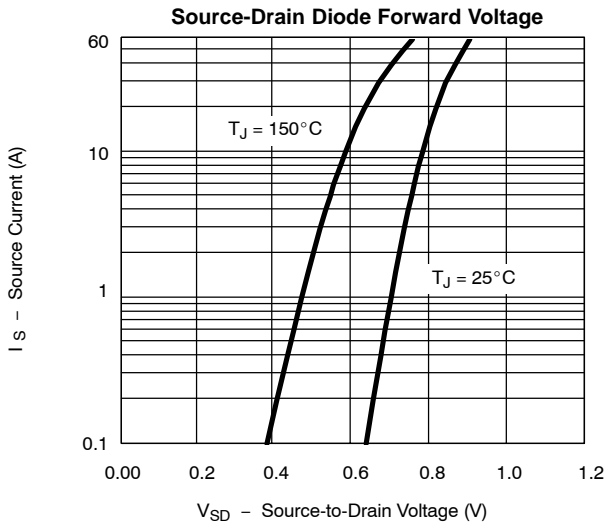
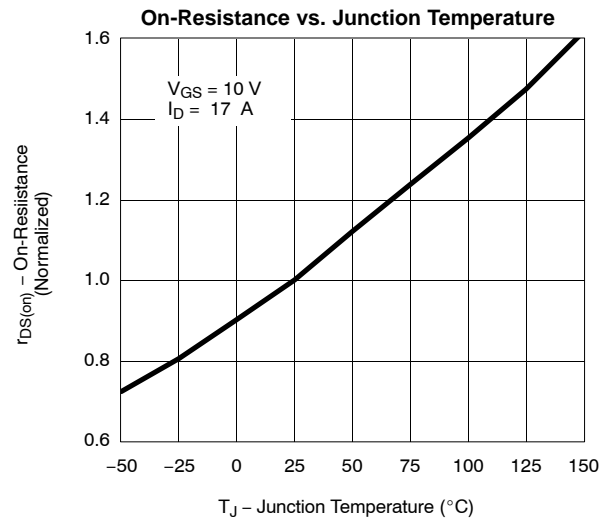
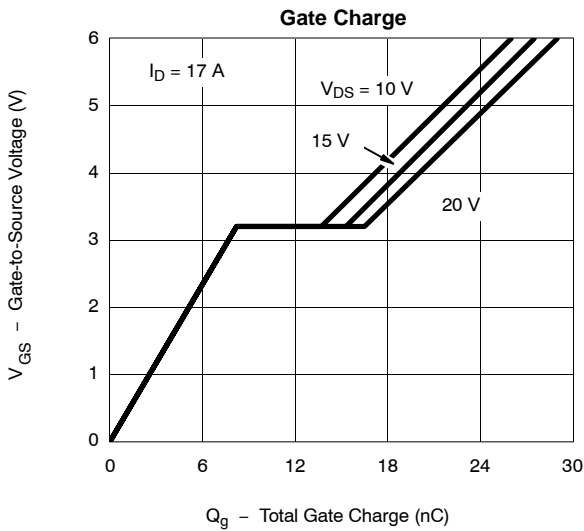
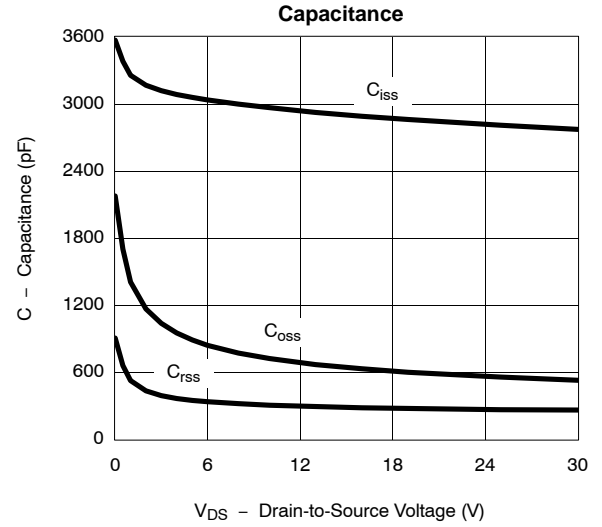
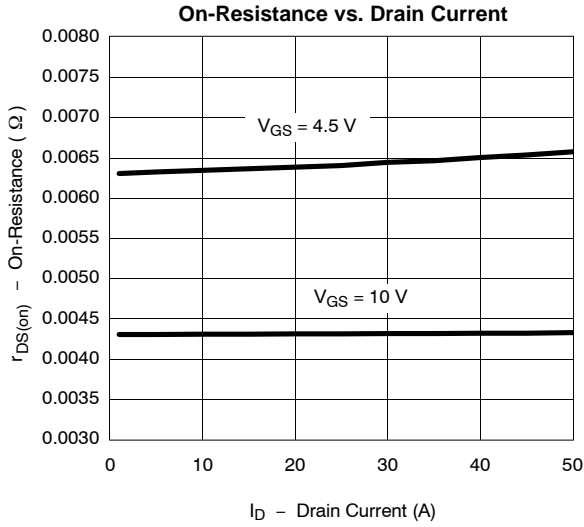
Notes

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

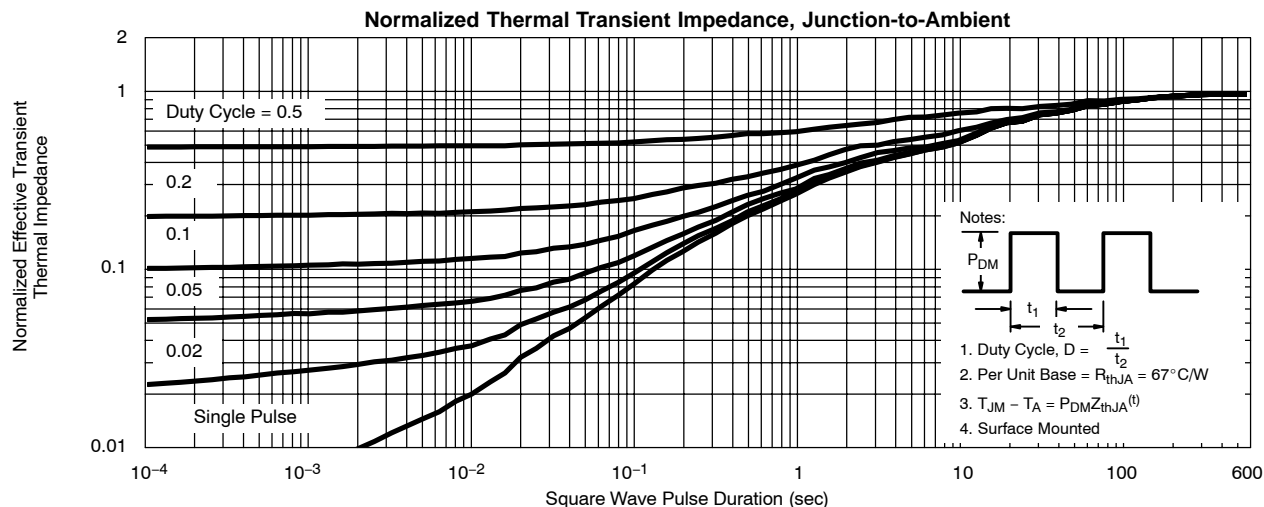
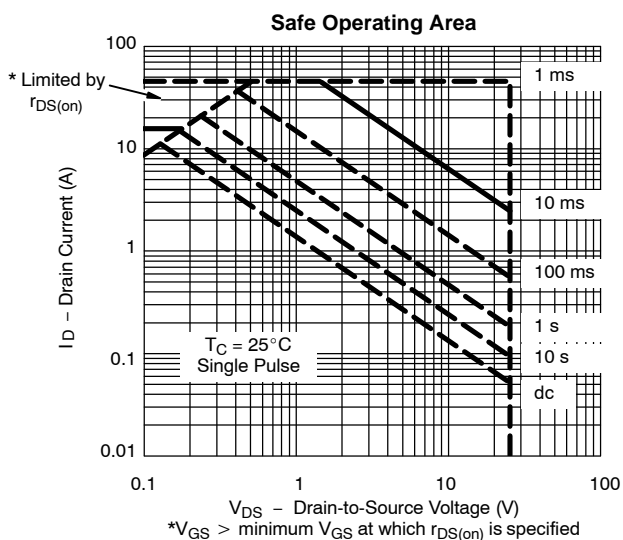
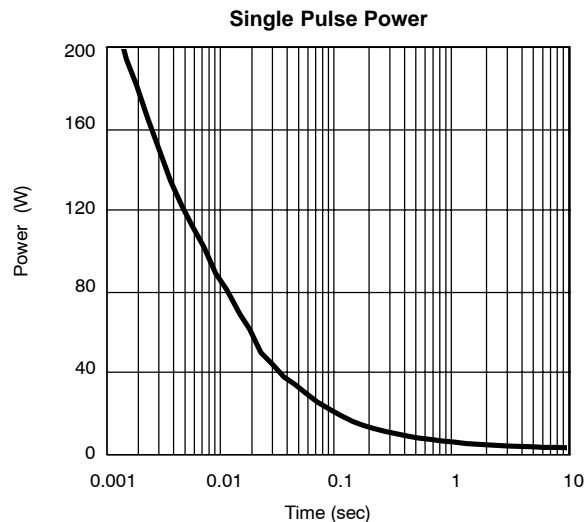
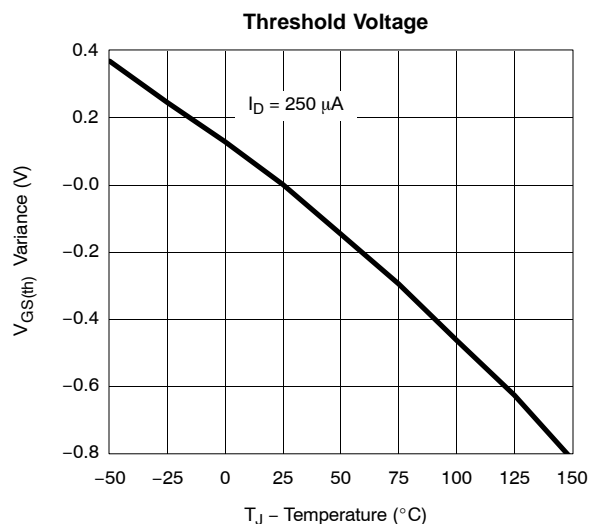
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

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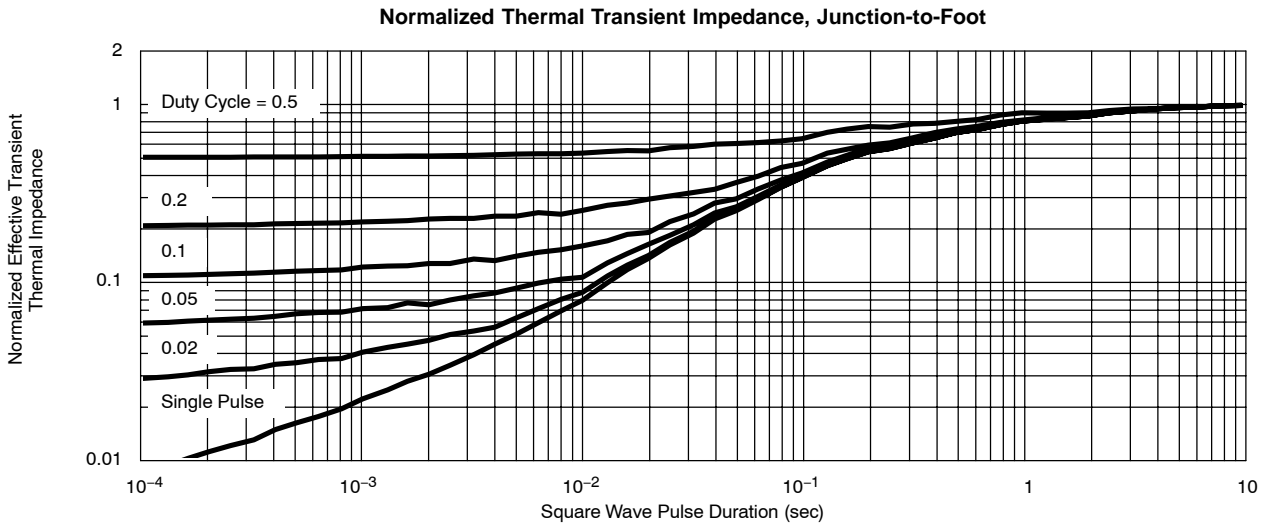


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