



Dual N-Channel 2.5-V (G-S) MOSFET



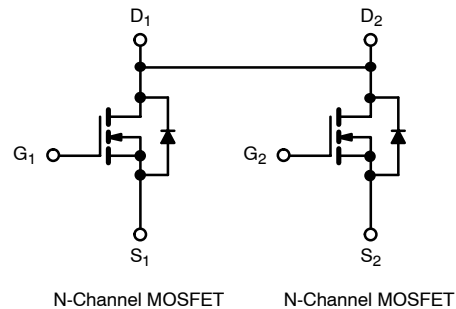
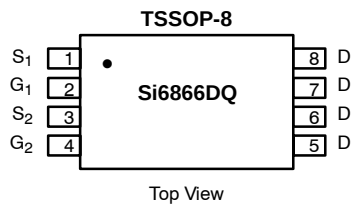
Available

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
20	0.030 @ $V_{GS} = 4.5$ V	± 5.8
	0.040 @ $V_{GS} = 2.5$ V	± 5.0

FEATURES

- TrenchFET® Power MOSFET
- 2.5-V Rated
- Lead (Pb)-Free Version is RoHS Compliant



Ordering Information: Si6866DQ-T1
Si6866DQ-T1—E3 (Lead (Pb)-Free)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V _{DS}	20		V
Gate-Source Voltage		V _{GS}	± 12		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	± 5.8	± 5.0	A
	T _A = 70°C		± 4.7	± 4.0	
Pulsed Drain Current (10 μs Pulse Width)		I _{DM}	± 30		
Continuous Source Current (Diode Conduction) ^a		I _S	1.5	1.1	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	1.67	1.2	
	T _A = 70°C		1.06	0.76	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	-55 to 150		°C

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient ^a	$t \leq 10$ sec	R_{thJA}	60	75	$^\circ\text{C/W}$
	Steady State		86	105	
Maximum Junction-to-Foot	Steady State	R_{thJF}	38	45	

Notes

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

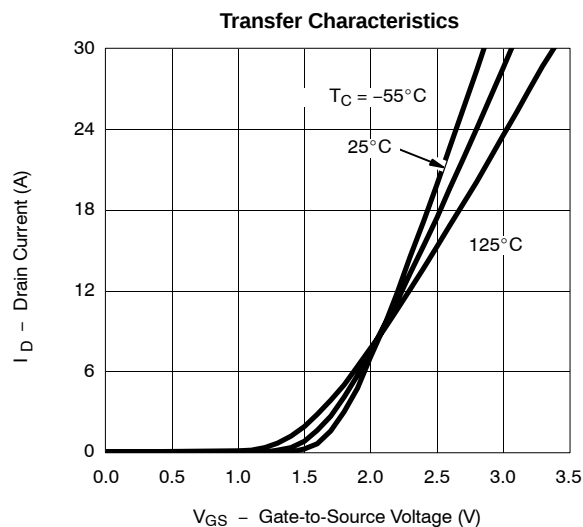
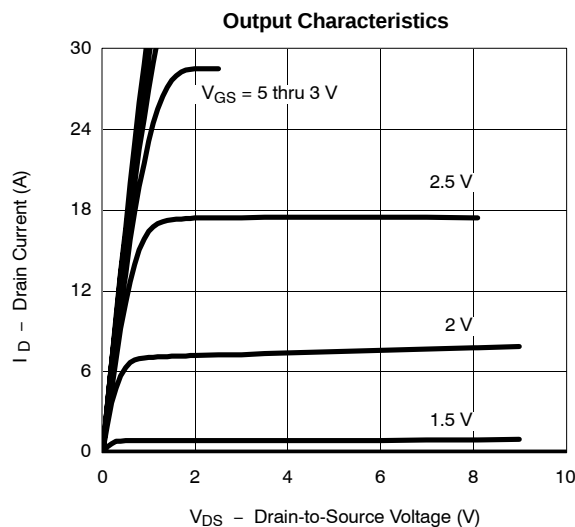
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\ \mu\text{A}$	0.6		1.5	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\ \text{V}$, $V_{GS} = \pm 12\ \text{V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 20\ \text{V}$, $V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 20\ \text{V}$, $V_{GS} = 0\ \text{V}$, $T_J = 85^\circ\text{C}$			25	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}$, $V_{GS} = 4.5\ \text{V}$	30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 4.5\ \text{V}$, $I_D = 5.8\ \text{A}$		0.023	0.030	Ω
		$V_{GS} = 2.5\ \text{V}$, $I_D = 5.0\ \text{A}$		0.033	0.040	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 10\ \text{V}$, $I_D = 5.8\ \text{A}$		18		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.5\ \text{A}$, $V_{GS} = 0\ \text{V}$		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 10\ \text{V}$, $V_{GS} = 4.5\ \text{V}$, $I_D = 5.8\ \text{A}$		11	15	nC
Gate-Source Charge	Q_{gs}			2.4		
Gate-Drain Charge	Q_{gd}			2.4		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 10\ \text{V}$, $R_L = 10\ \Omega$ $I_D \cong 1\ \text{A}$, $V_{GEN} = 4.5\ \text{V}$, $R_G = 6\ \Omega$		17	25	ns
Rise Time	t_r			37	50	
Turn-Off Delay Time	$t_{d(off)}$			41	55	
Fall Time	t_f			24	35	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.5\ \text{A}$, $di/dt = 100\ \text{A}/\mu\text{s}$		30	40	

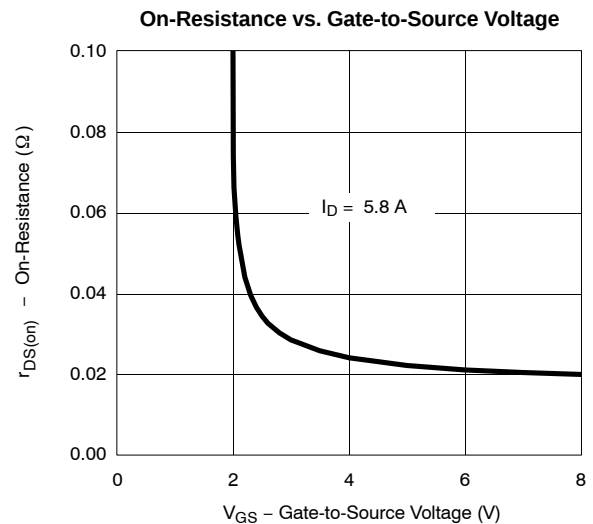
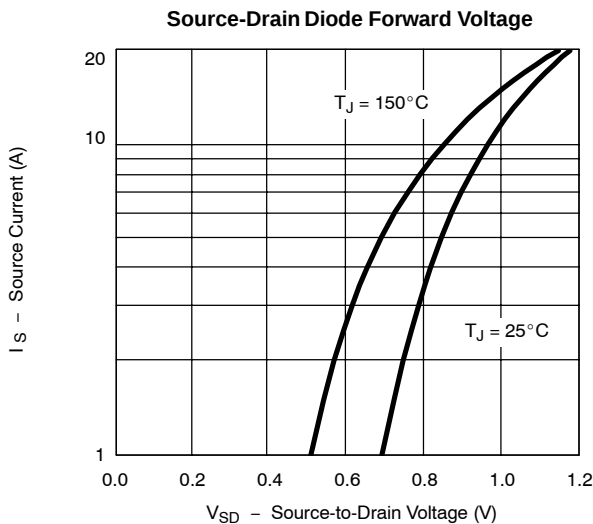
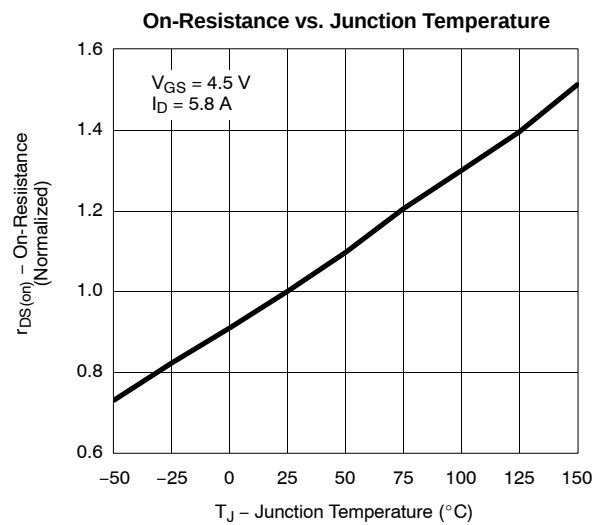
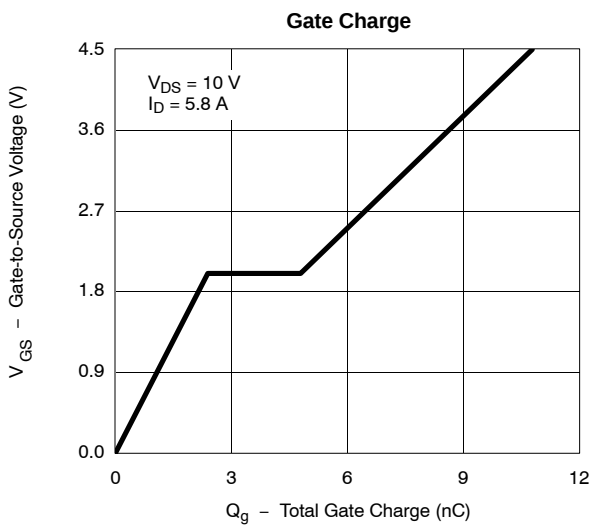
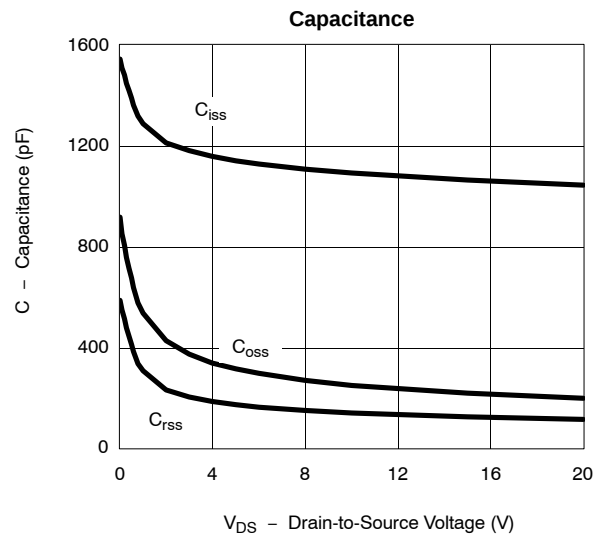
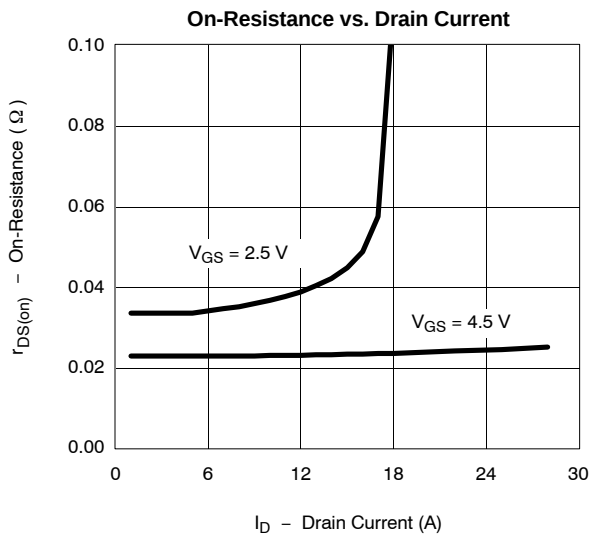
Notes

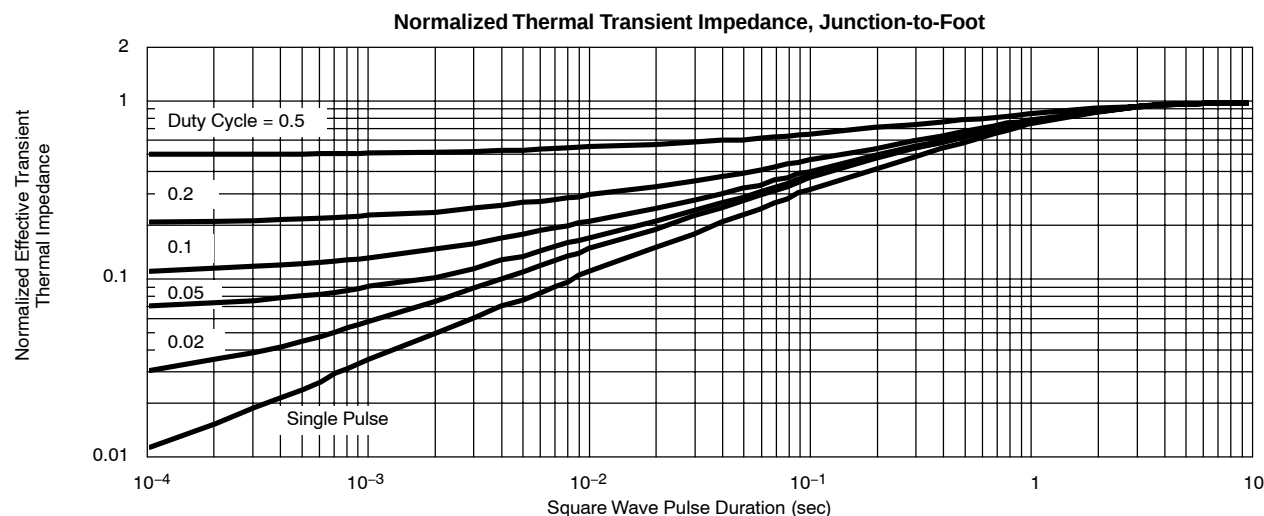
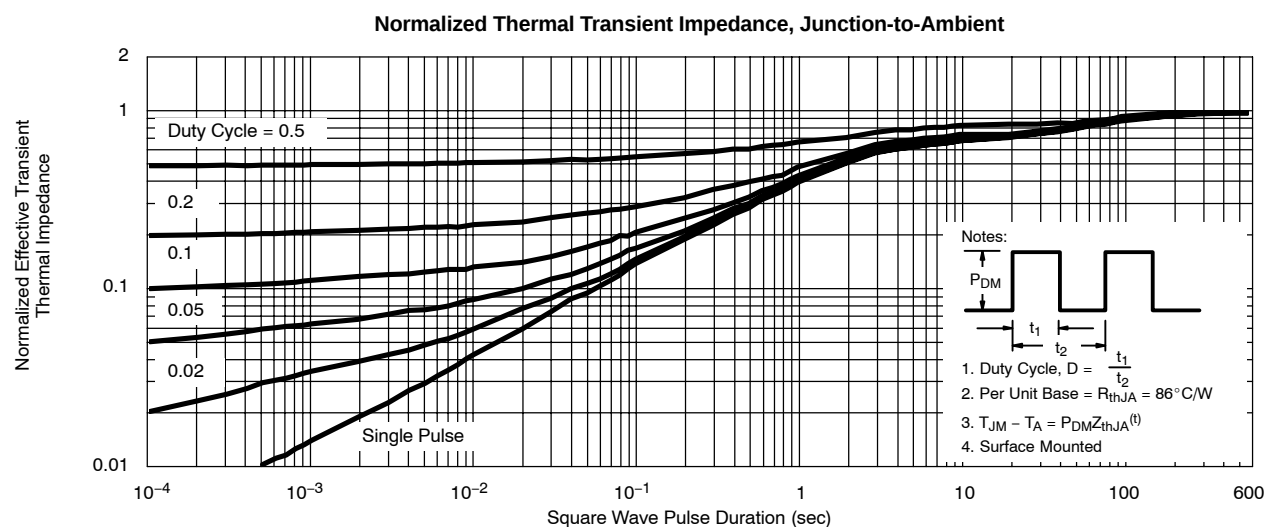
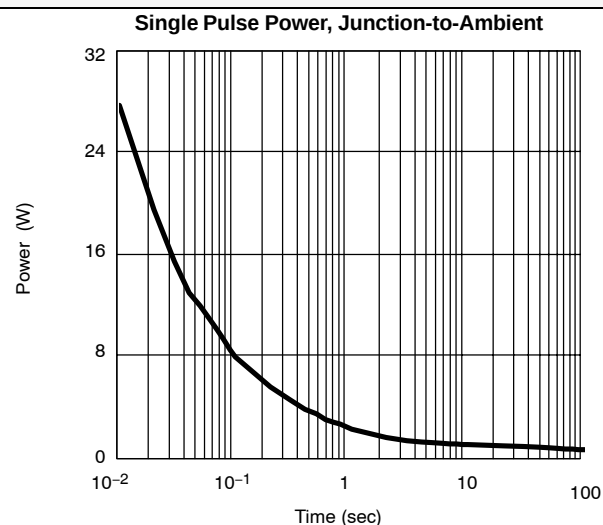
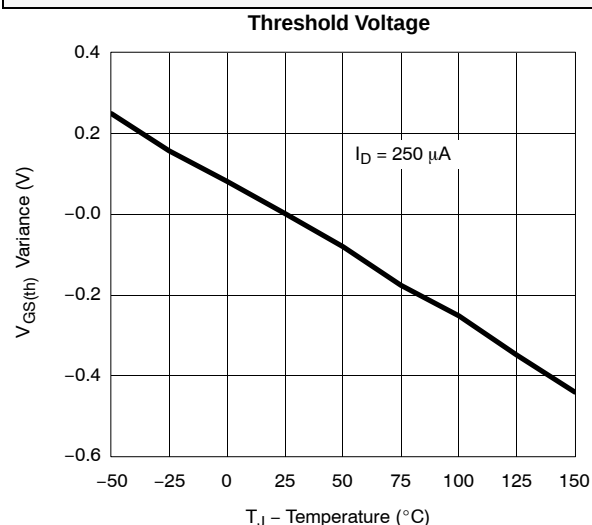
- a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.

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)

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