



New Product

Si6993DQ
Vishay Siliconix

Dual P-Channel 30-V (D-S) MOSFET

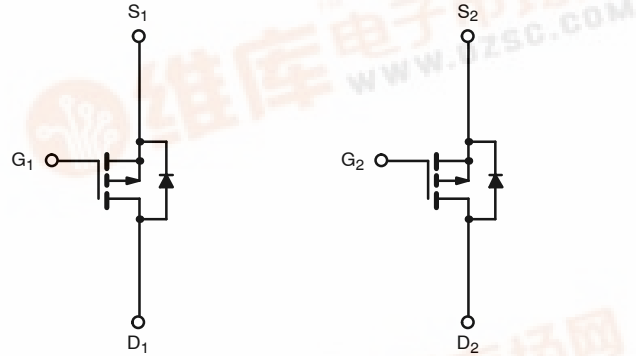
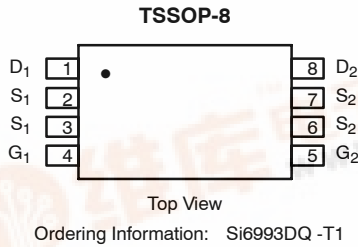
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
-30	0.031 @ $V_{GS} = -10$ V	-4.7
	0.048 @ $V_{GS} = -4.5$ V	-3.8

FEATURES

- TrenchFET® Power MOSFETS

APPLICATIONS

- Load Switch
- Battery Switch



P-Channel MOSFET

P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)					
Parameter		Symbol	10 secs	Steady State	Unit
Drain-Source Voltage		V_{DS}	-30		V
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current ($T_J = 150^\circ\text{C}$) ^a	$T_A = 25^\circ\text{C}$	I_D	-4.7	-3.6	A
	$T_A = 70^\circ\text{C}$		-3.8	-3.2	
Pulsed Drain Current (10 μs Pulse Width)		I_{DM}	-30		
Continuous Source Current (Diode Conduction) ^a		I_S	-1.0	-0.70	
Maximum Power Dissipation ^a	$T_A = 25^\circ\text{C}$	P_D	1.14	0.83	W
	$T_A = 70^\circ\text{C}$		0.73	0.53	
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 ^a	$t \leq 10$ sec	R_{thJA}	86	110	$^\circ\text{C}/\text{W}$
	Steady State		124	150	
Maximum Junction-to-Foot	Steady State	R_{thJF}	52	65	

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

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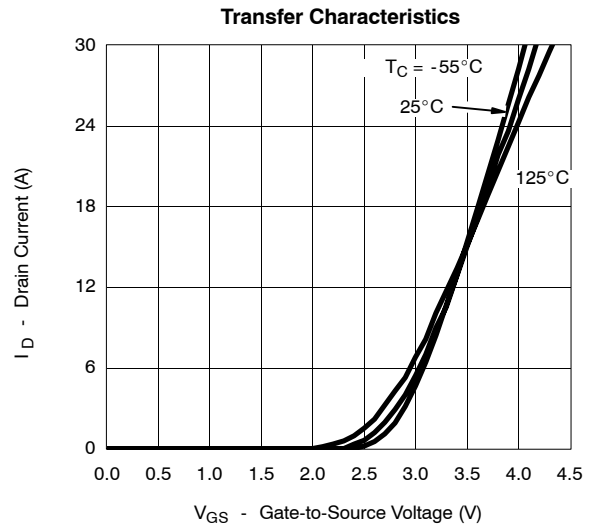
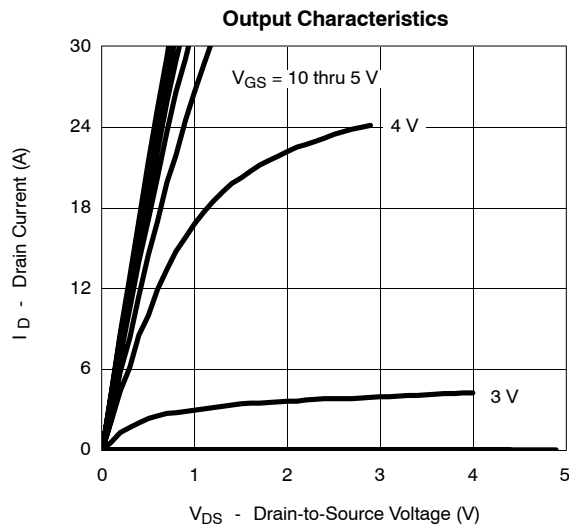


SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1.0		-3.0	V
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -30 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -30 V, V _{GS} = 0 V, T _J = 55 °C			-10	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ -5 V, V _{GS} = -10 V	-15			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -4.7 A		0.024	0.031	Ω
		V _{GS} = -4.5 V, I _D = -3.8 A		0.038	0.048	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -4.7 A		14		S
Diode Forward Voltage ^a	V _{SD}	I _S = -1.0 A, V _{GS} = 0 V		-0.74	-1.1	V
Dynamic^b						
Total Gate Charge	Q _g	V _{DS} = -15 V, V _{GS} = -4.5 V, I _D = -4.7 A		13	20	nC
Gate-Source Charge	Q _{gs}			3		
Gate-Drain Charge	Q _{gd}			5.8		
Gate Resistance	R _g	f = 1.0 MHz		4.6		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		13	20	ns
Rise Time	t _r			14	22	
Turn-Off Delay Time	t _{d(off)}			52	80	
Fall Time	t _f			26	40	
Source-Drain Reverse Recovery Time	t _{rr}	I _F = -1.0 A, di/dt = 100 A/μs		40	60	

Notes

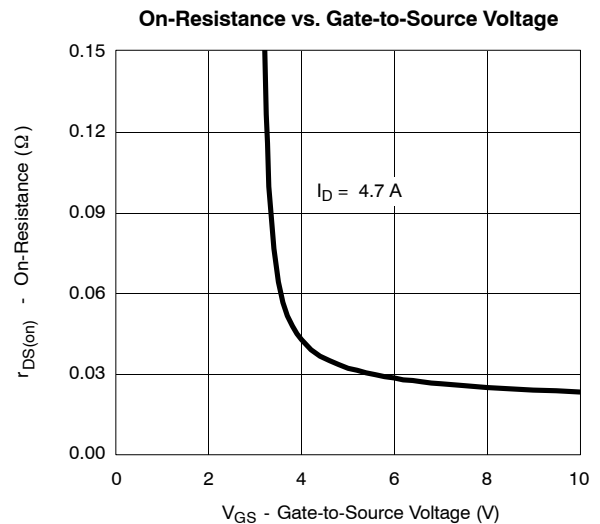
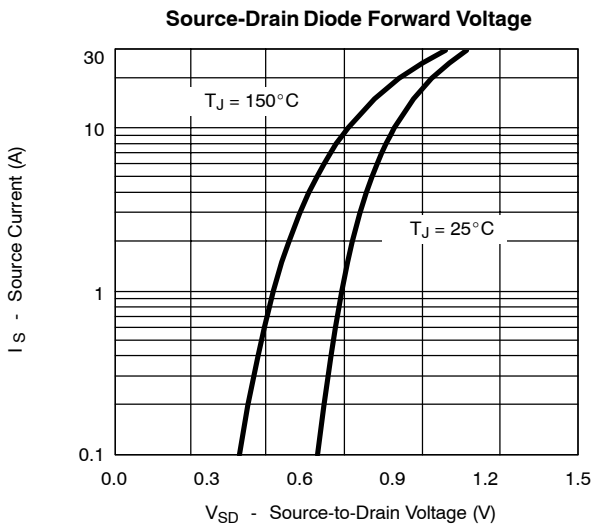
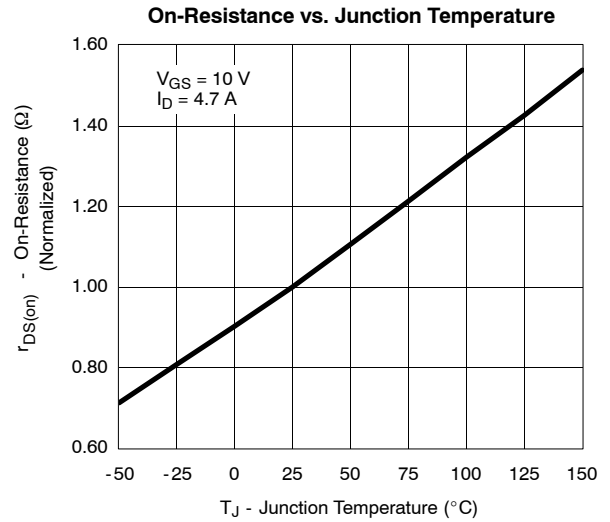
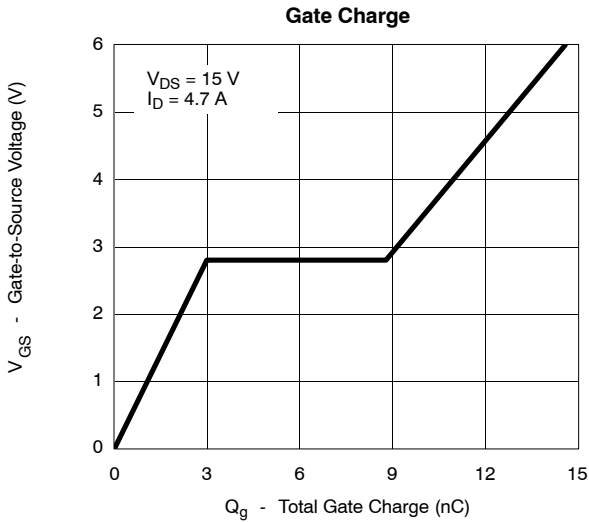
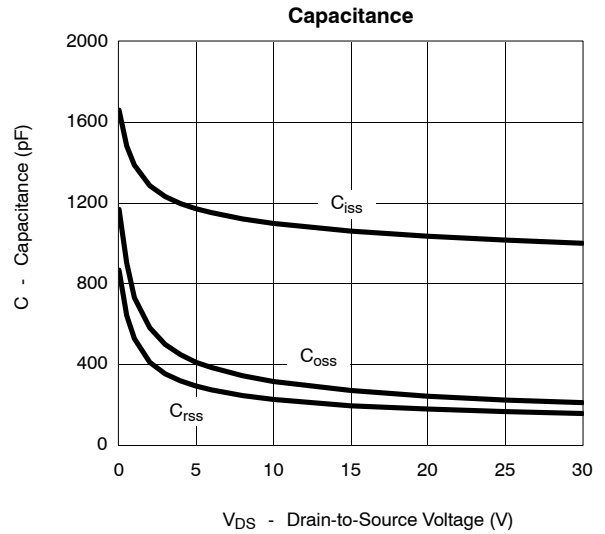
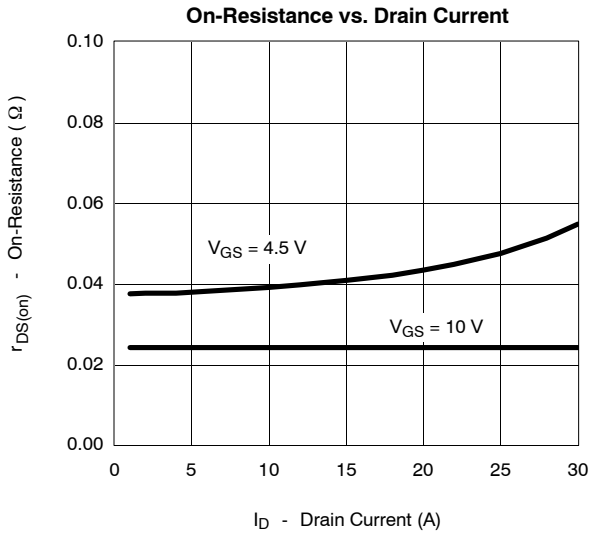
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



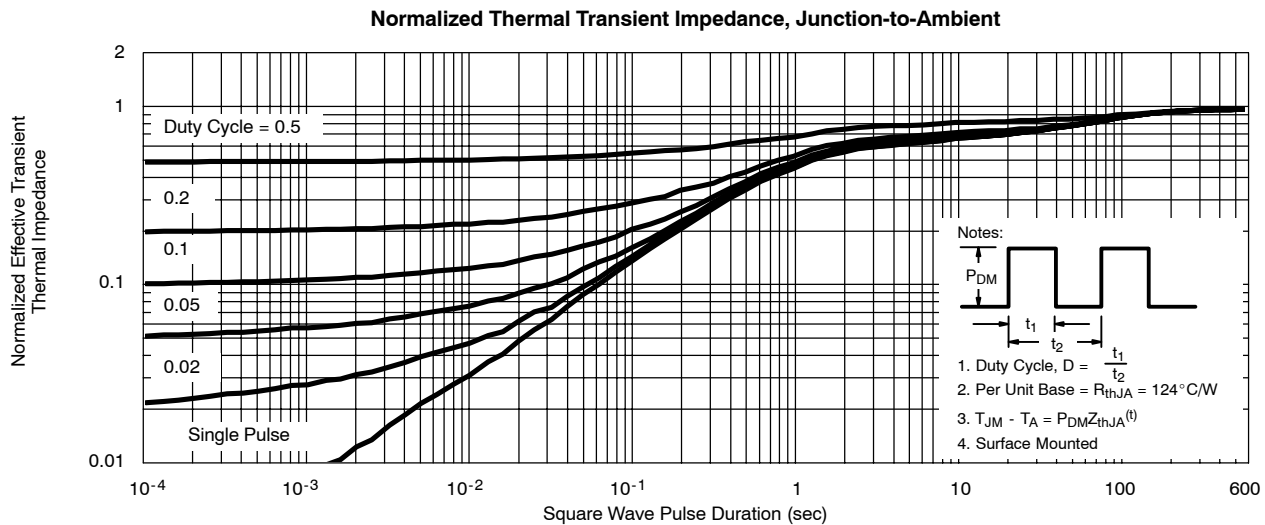
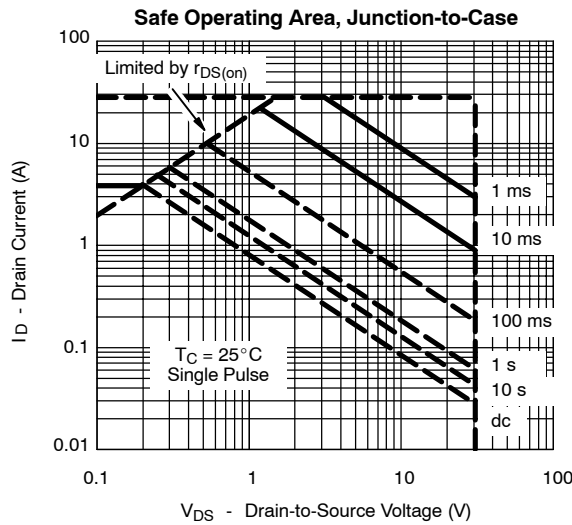
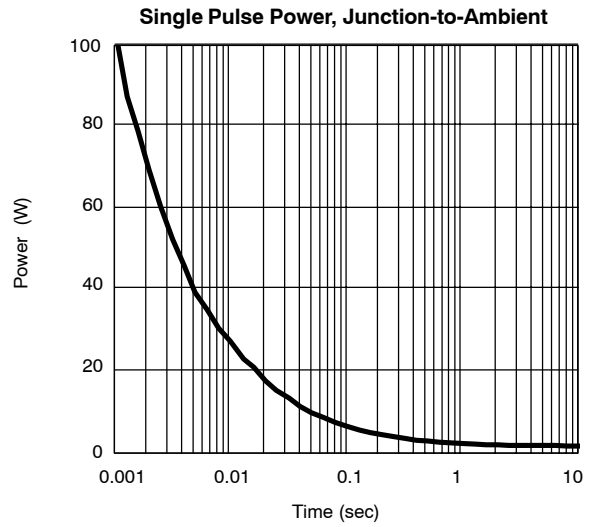
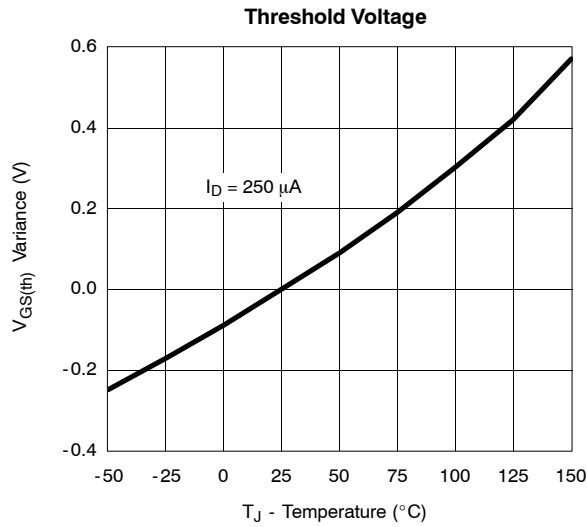


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