



Dual N-Channel 40-V (D-S) MOSFET

PRODUCT SUMMARY

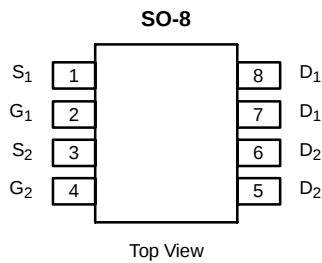
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
40	0.021 @ $V_{GS} = 10$ V	7.4
	0.028 @ $V_{GS} = 4.5$ V	6.4

FEATURES

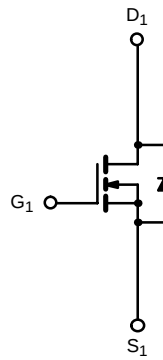
- TrenchFET® Power MOSFET

APPLICATIONS

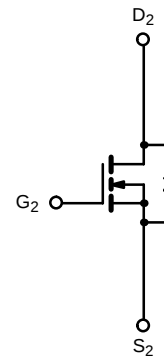
- Low Power Synchronous Rectifier
- Automotive 12-V Systems



Ordering Information: Si4942DY
Si4942DY-T1 (with Tape and Reel)



N-Channel MOSFET



N-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}	40		V
Gate-Source Voltage		V _{GS}	± 20		
Continuous Drain Current (T _J = 150°C) ^a	T _A = 25°C	I _D	7.4	5.3	A
	T _A = 70°C		5.8	4.3	
Pulsed Drain Current		I _{DM}	30		
Avalanche Current	L = 0.1 mH	I _{AS}	25		
Continuous Source Current (Diode Conduction) ^a		I _S	1.8	0.9	
Maximum Power Dissipation ^a	T _A = 25°C	P _D	2.1	1.1	W
	T _A = 70°C		1.3	0.7	
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}	50	60	$^\circ\text{C/W}$
	Steady State		90	110	
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	28	34	

Notes

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

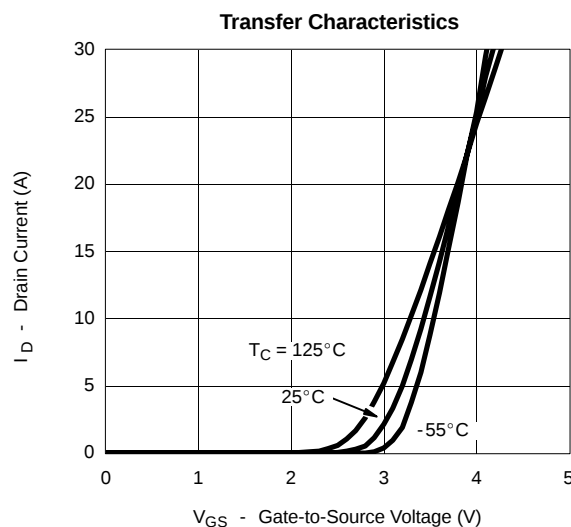
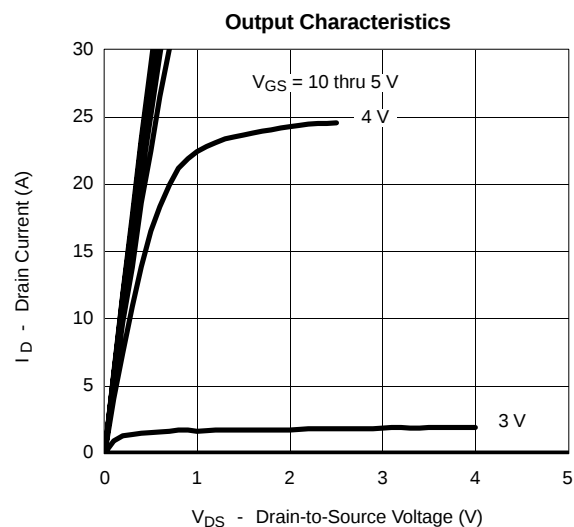
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	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}	$V_{DS} = 32\ \text{V}, V_{GS} = 0\ \text{V}$			1	μA
		$V_{DS} = 32\ \text{V}, V_{GS} = 0\ \text{V}, T_J = 55^\circ\text{C}$			5	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\ \text{V}, V_{GS} = 10\ \text{V}$	30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\ \text{V}, I_D = 7.4\ \text{A}$		0.017	0.021	Ω
		$V_{GS} = 4.5\ \text{V}, I_D = 6.4\ \text{A}$		0.023	0.028	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\ \text{V}, I_D = 7.4\ \text{A}$		25		S
Diode Forward Voltage ^a	V_{SD}	$I_S = 1.8\ \text{A}, V_{GS} = 0\ \text{V}$		0.75	1.1	V
Dynamic^b						
Total Gate Charge	Q_g	$V_{DS} = 20\ \text{V}, V_{GS} = 10\ \text{V}, I_D = 5.7\ \text{A}$		21	32	nC
Gate-Source Charge	Q_{gs}			3.3		
Gate-Drain Charge	Q_{gd}			5.8		
Gate Resistance	R_G		0.5	1.1	1.6	Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 20\ \text{V}, R_L = 20\ \Omega$ $I_D \cong 1\ \text{A}, V_{GEN} = 10\ \text{V}, R_G = 6\ \Omega$		13	20	ns
Rise Time	t_r			10	15	
Turn-Off Delay Time	$t_{d(off)}$			31	50	
Fall Time	t_f			11	20	
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 1.8\ \text{A}, di/dt = 100\ \text{A}/\mu\text{s}$		30	60	

Notes

a. Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

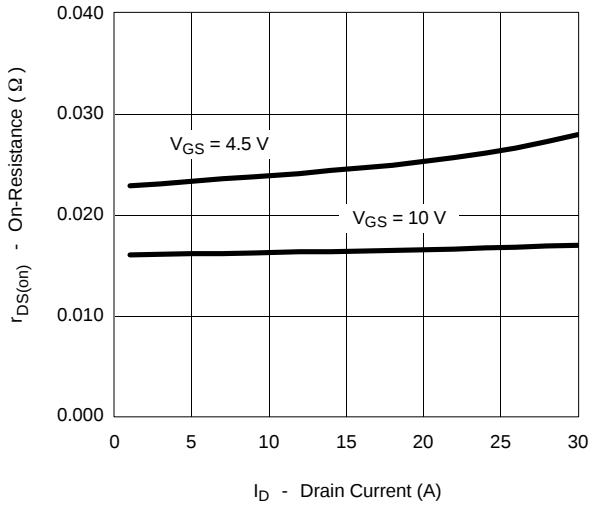
b. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

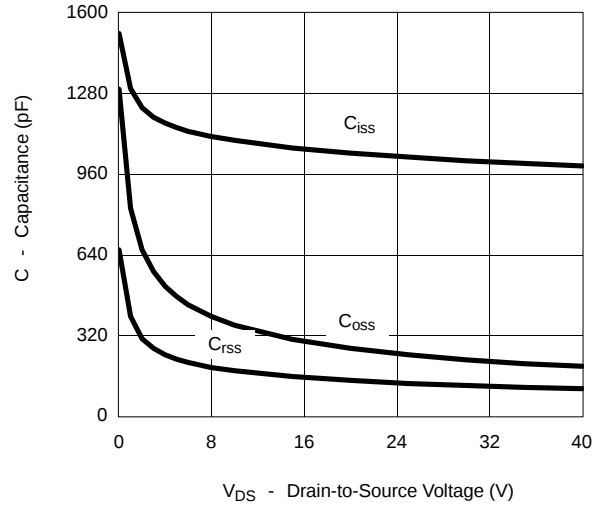


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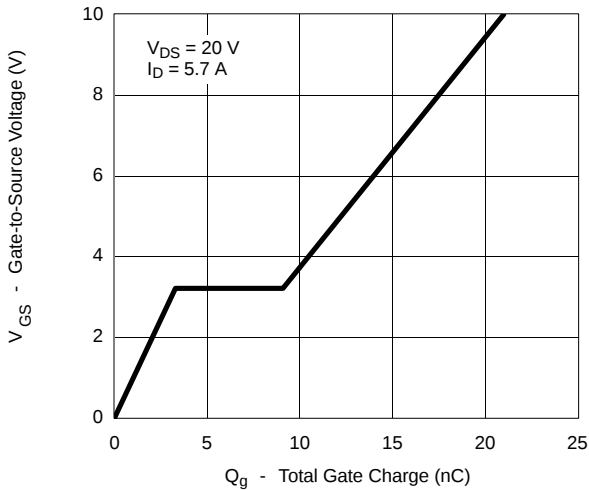
On-Resistance vs. Drain Current



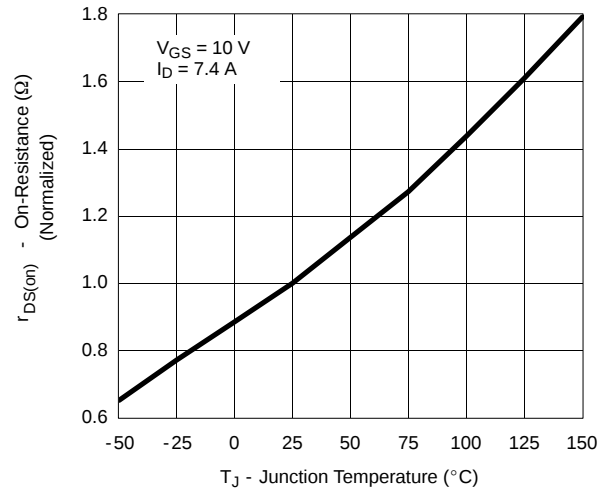
Capacitance



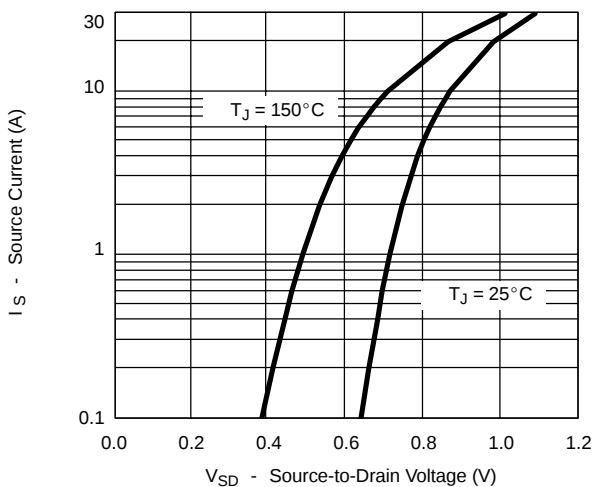
Gate Charge



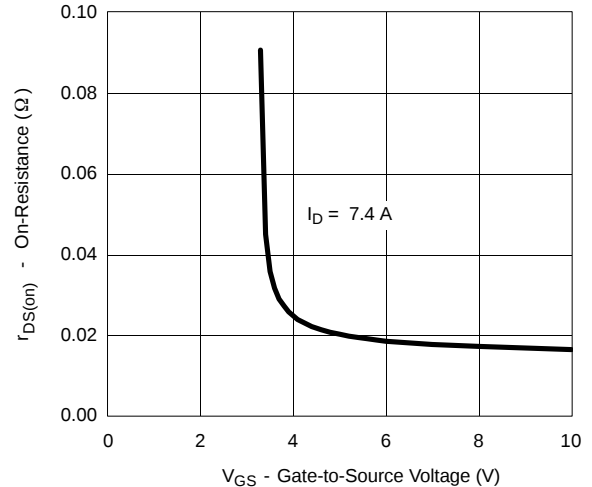
On-Resistance vs. Junction Temperature



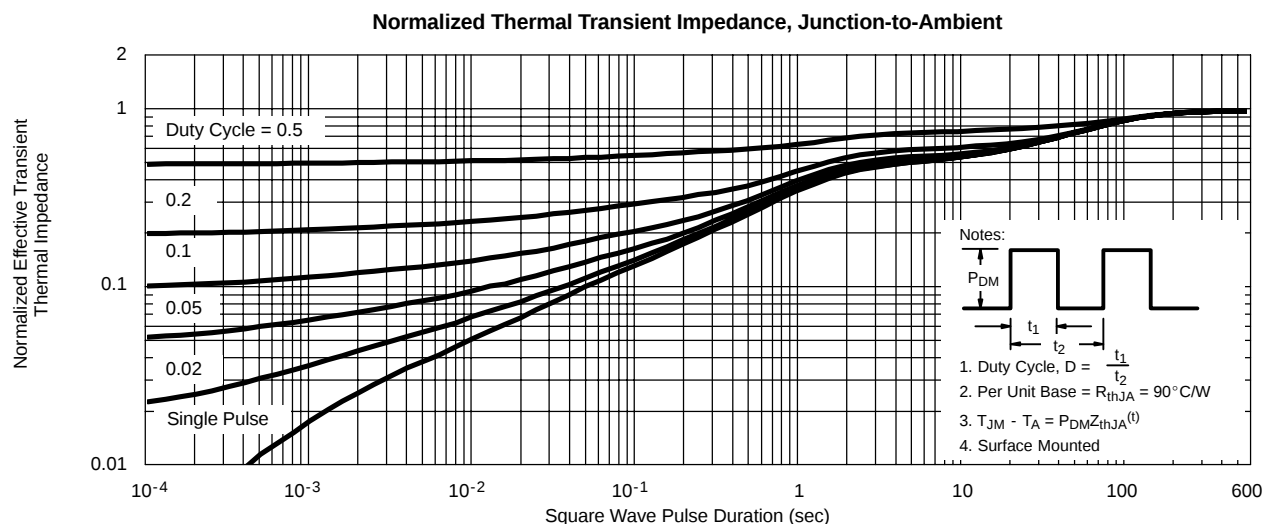
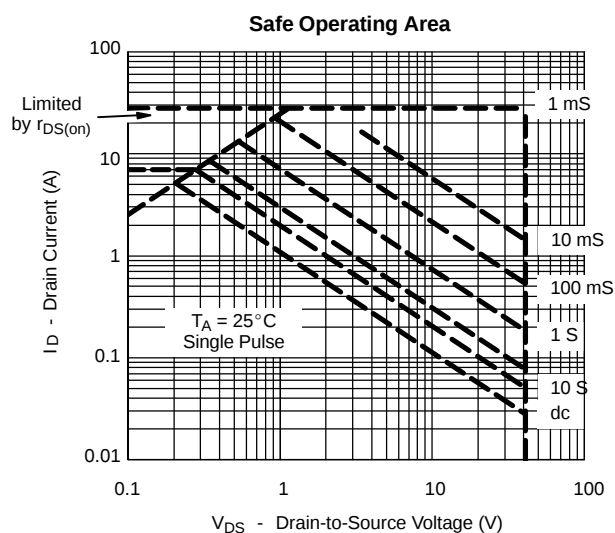
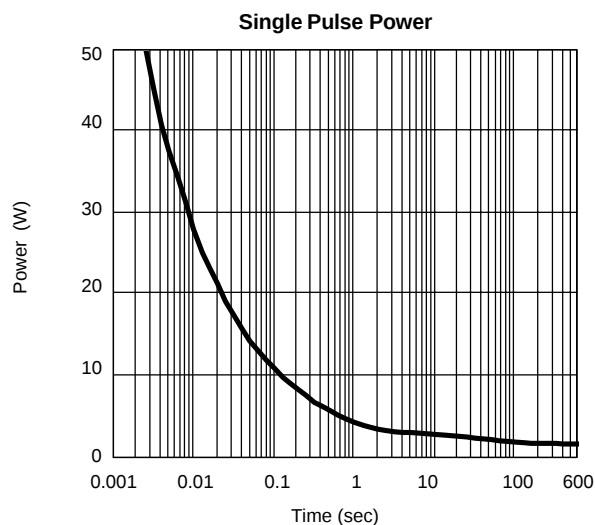
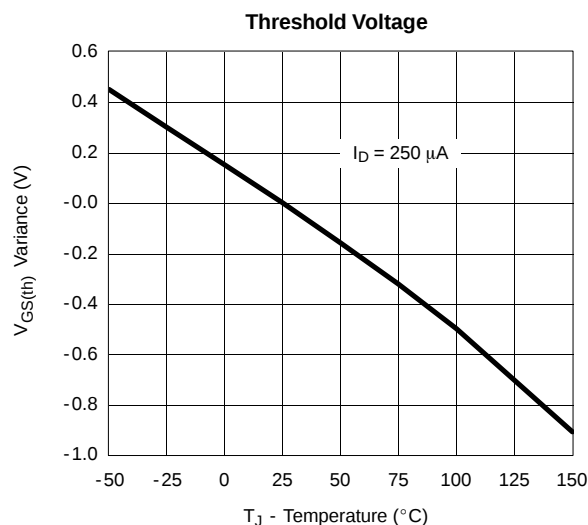
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)





TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

