

Absolute Maximum Ratings T_A = 25°C unless otherwise noted

Symbol	Parameter	Ratings	Units
V _{DSS}	Drain-Source Voltage	50	V
V _{GSS}	Gate-Source Voltage	±20	V
I _D	Drain Current - Continuous (Note 1a)	3.0	A
	- Pulsed	10	
P _D	Power Dissipation for Single Operation	2.0	W
	Power Dissipation for Single Operation (Note 1a)	1.6	
	(Note 1b)	1	
	(Note 1c)	0.9	
T _J , T _{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics

R _{θJA}	Thermal Resistance, Junction-to-Ambient	62.5	°C/W
R _{θJC}	Thermal Resistance, Junction-to-Case (Note 1)	40	°C/W

Package Outlines and Ordering Information

Device Marking	Device	Reel Size	Tape Width	Quantity
9955	SI9955DY	13"	12mm	2500 units

* Die and manufacturing source subject to change without prior notification.

Electrical Characteristics T_A = 25°C unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 250 μA	50			V
$\frac{\Delta BV_{DSS}}{\Delta T_J}$	Breakdown Voltage Temperature Coefficient	I _D = 250 μA, Referenced to 25°C		60		mV/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40 V, V _{GS} = 0 V V _{DS} = 40 V, V _{GS} = 0 V, T _J = 55°C			2 25	μA
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} = 20 V, V _{DS} = 0 V			100	nA
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} = -20 V, V _{DS} = 0 V			-100	nA

On Characteristics (Note 2)

V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250 μA	1			V
$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	Gate Threshold Voltage Temperature Coefficient	I _D = 250 μA, Referenced to 25°C		-4.5		mV/°C
R _{DS(on)}	Static Drain-Source On-Resistance	V _{GS} = 10 V, I _D = 3 A V _{GS} = 10 V, I _D = 3 A, T _J = 125°C V _{GS} = 4.5 V, I _D = 1.5 A		0.076 0.124 0.103	0.130 0.200 0.200	Ω
I _{D(on)}	On-State Drain Current	V _{GS} = 10 V, V _{DS} = 5 V	10			A
g _{FS}	Forward Transconductance	V _{DS} = 15 V, I _D = 3 A		5.3		S

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$		345		pF
C_{oss}	Output Capacitance			110		pF
C_{rss}	Reverse Transfer Capacitance			25		pF

Switching Characteristics (Note 2)

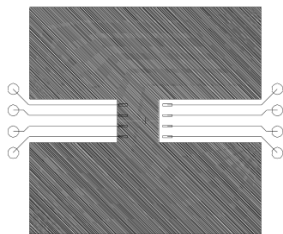
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 25\text{ V}, I_D = 1\text{ A}, R_L = 25\ \Omega$ $V_{GS} = 10\text{ V}, R_{GEN} = 6\ \Omega$		5	20	ns
t_r	Turn-On Rise Time			7.5	20	ns
$t_{d(off)}$	Turn-Off Delay Time			20	70	ns
t_f	Turn-Off Fall Time			7	50	ns
t_{rr}	Drain-Source Reverse Recovery Time	$I_F = 1.5\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		40	100	nS
Q_g	Total Gate Charge	$V_{DS} = 25\text{ V}, I_D = 2\text{ A},$ $V_{GS} = 10\text{ V}$		13	30	nC
Q_{gs}	Gate-Source Charge			1.7		nC
Q_{gd}	Gate-Drain Charge			3.2		nC

Drain-Source Diode Characteristics and Maximum Ratings

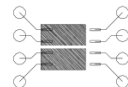
I_S	Maximum Continuous Drain-Source Diode Forward Current			2.0	A	
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0\text{ V}, I_S = 1.5\text{ A}$ (Note 2)		0.8	1.2	V

Notes:

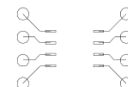
- $R_{\theta JA}$ is the sum of the junction-to-case and case-to-ambient resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.



a) 78° C/W when mounted on a 0.5 in² pad of 2 oz. copper.



b) 125° C/W when mounted on a 0.02 in² pad of 2 oz. copper.



c) 135° C/W when mounted on a 0.003 in² pad of 2 oz. copper.

Scale 1 : 1 on letter size paper

- Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2.0\%$

