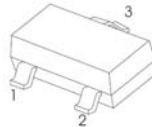


FEATURE

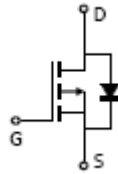
- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability

SOT-23

1. GATE
2. SOURCE
3. DRAIN

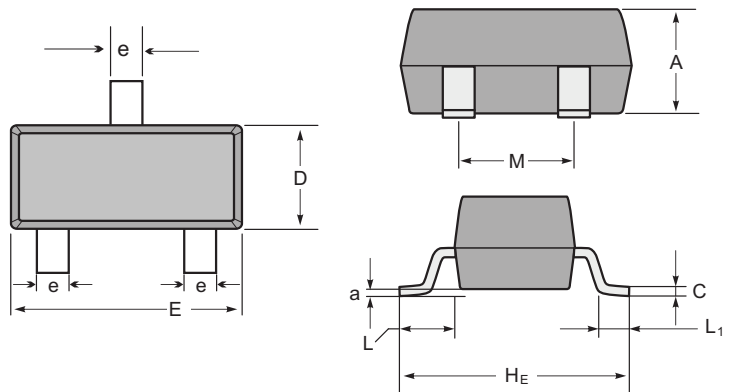


Equivalent Circuit



Marking

Type number	Marking code
SI2333	S33



SOT-23 mechanical data

UNIT		A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)	0.0
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7			0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)	0.0
	min	35	3	47	110	87	12	67			6

ABSOLUTE MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-12	V
Gate-Source Voltage	V_{GS}	± 8	V
Continuous Drain Current	I_D	-6 ^a	A
Pulsed Drain Current ($t=300\mu\text{s}$)	I_{DM}	-20	A
Power Dissipation	P_D	0.35 ^b	W
		1.1 ^a	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	357 ^b	$^\circ\text{C/W}$
		113 ^a	$^\circ\text{C/W}$
Junction Temperature	T_J	150	$^\circ\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^\circ\text{C}$

a. Device mounted on FR-4 substrate board, with minimum recommended pad layout, single side.

b. Device mounted on no heat sink.

SI2333

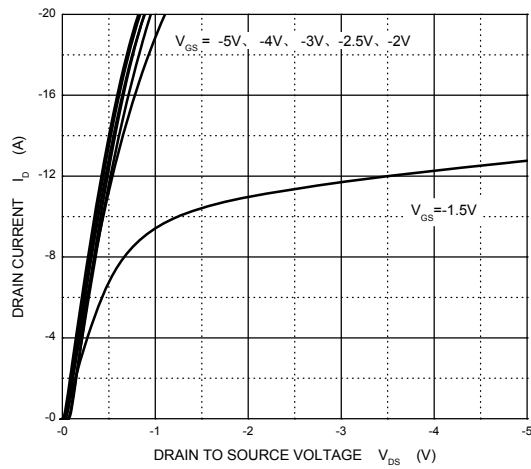
$T_a = 25^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = -250μA	-12			V
Zero gate voltage drain current	I _{DSS}	V _{DS} = -12V, V _{GS} = 0V			-1	μA
Gate-body leakage current	I _{GSS}	V _{GS} = ±8V, V _{DS} = 0V			±0.1	μA
Gate threshold voltage (note 1)	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250μA	-0.4		-1	V
Drain-source on-resistance (note 1)	R _{DS(on)}	V _{GS} = -4.5V, I _D = -5A			28	mΩ
		V _{GS} = -3.7V, I _D = -4.6A			32	
		V _{GS} = -2.5V, I _D = -4.3A			40	
		V _{GS} = -1.8V, I _D = -1A			63	
		V _{GS} = -1.5V, I _D = -0.5A			150	
Forward tranconductance (note 1)	g _{FS}	V _{DS} = -5V, I _D = -5A		18		S
Dynamic characteristics (note 2)						
Input Capacitance	C _{iss}	V _{DS} = -6V, V _{GS} = 0V, f = 1MHz		1275		pF
Output Capacitance	C _{oss}			255		pF
Reverse Transfer Capacitance	C _{rss}			236		pF
Gate resistance	R _g	f = 1MHz	1.9		19	Ω
Total Gate Charge	Q _g	V _{DS} = -6V, V _{GS} = -4.5V, I _D = -5A		14	21	nC
Gate-Source Charge	Q _{gs}			2.3		nC
Gate-Drain Charge	Q _{gd}			3.6		nC
Turn-on delay time	t _{d(on)}	V _{DD} = -6V, V _{GEN} = -4.5V, I _D = -4A R _L = 6Ω, R _{GEN} = 1Ω		26	40	ns
Turn-on rise time	t _r			24	40	ns
Turn-off delay time	t _{d(off)}			45	70	ns
Turn-off fall time	t _f			20	35	ns
Source-Drain Diode characteristics						
Diode forward current	I _S	T _C = 25°C			-1.4	A
Diode pulsed forward current	I _{SM}				-20	A
Diode Forward voltage (note 1)	V _{DS}	V _{GS} = 0V, I _S = -4A			-1.2	V
Diode reverse recovery time (note 2)	t _{rr}	I _F = -4A, dI/dt = 100A/μs		24	48	ns
Diode reverse recovery charge (note 2)	Q _{rr}			8	16	nC

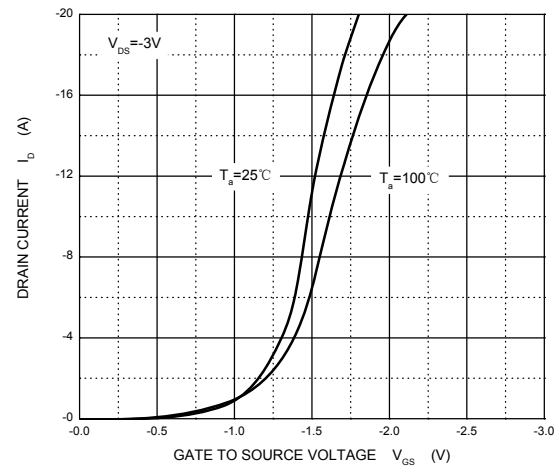
- Notes :**
1. Pulse test; pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
 2. Guaranteed by design, not subject to production testing.

RATING AND CHARACTERISTIC CURVES (SI2333)

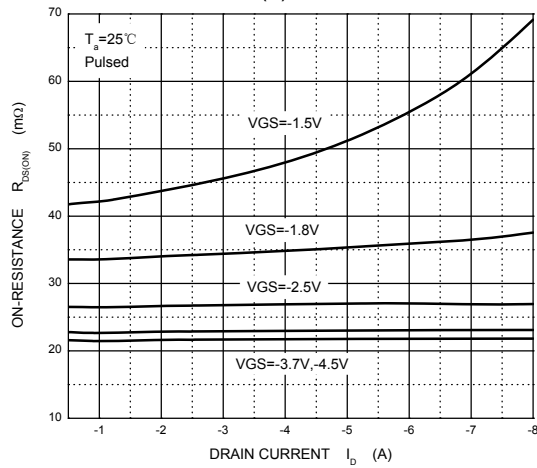
Output Characteristics



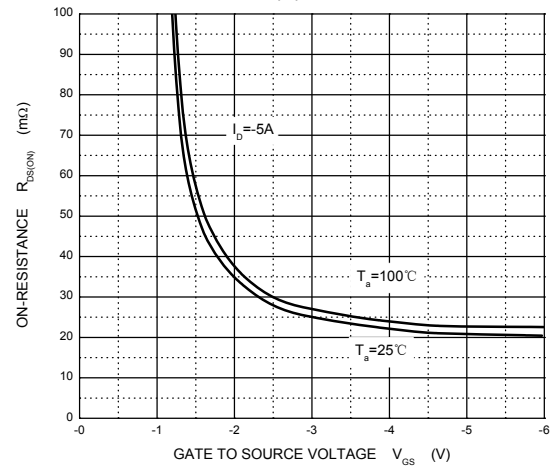
Transfer Characteristics



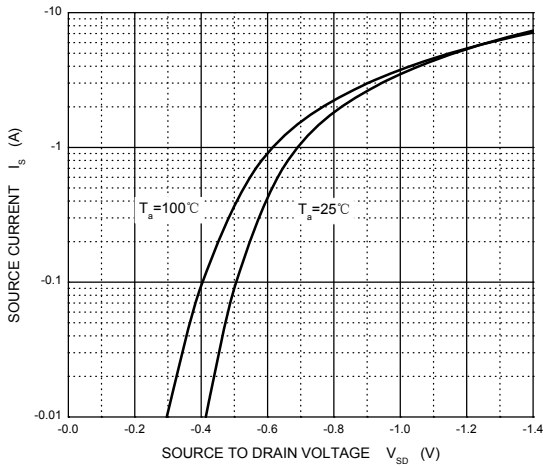
$R_{DS(ON)}$ — I_D



$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}



Threshold Voltage

