

SI2333CDS

MOSFET PRODUCT SUMMARY			
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A) ^a	Q _g (Typ.)
- 12	0.035 at V _{GS} = - 4.5 V	- 5.1	9 nC
	0.045 at V _{GS} = - 2.5 V	- 4.5	
	0.059 at V _{GS} = - 1.8 V	- 3.9	

FEATURES

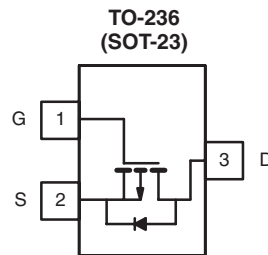
- TrenchFET® Power MOSFET

APPLICATIONS

- Load Switch
- PA Switch



RoHS
COMPLIANT



Top View
SI2333CDS (O3)*
* Marking Code

Ordering Information: SI2333CDS-T1-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T _A = 25 °C, unless otherwise noted			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	- 12	V
Gate-Source Voltage	V _{GS}	± 8	
Continuous Drain Current (T _J = 150 °C)	I _D	T _C = 25 °C	- 7.1
		T _C = 70 °C	- 5.7
		T _A = 25 °C	- 5.1 ^{b, c}
		T _A = 70 °C	- 4.0 ^{b, c}
Pulsed Drain Current	I _{DM}	- 20	A
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C	
		T _A = 25 °C	- 0.63 ^{b, c}
Maximum Power Dissipation	P _D	T _C = 25 °C	2.5
		T _C = 70 °C	1.6
		T _A = 25 °C	1.25 ^{b, c}
		T _A = 70 °C	0.8 ^{b, c}
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 ^{b, d}	≤ 5 s	R _{thJA}	75	100	°C/W
Maximum Junction-to-Foot (Drain)	Steady State	R _{thJF}	40	50	

Notes:

- Based on T_C = 25 °C.
- Surface Mounted on 1" x 1" FR4 board.
- t = 5 s.
- Maximum under Steady State conditions is 166 °C/W.



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MOSFET SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 12			V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		- 13		mV/ $^\circ\text{C}$
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$		2.6			
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 0.4		- 1	V
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 8\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -12\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -12\text{ V}, V_{GS} = 0\text{ V}, T_J = 55\text{ }^\circ\text{C}$			- 10	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \leq -5\text{ V}, V_{GS} = -4.5\text{ V}$	- 20			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = -4.5\text{ V}, I_D = -5.1\text{ A}$		0.0285	0.035	Ω
		$V_{GS} = -2.5\text{ V}, I_D = -4.5\text{ A}$		0.036	0.045	
		$V_{GS} = -1.8\text{ V}, I_D = -2.0\text{ A}$		0.046	0.059	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -5\text{ V}, I_D = -1.9\text{ A}$		1.6		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{DS} = -6\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		1225		pF
Output Capacitance	C_{oss}		315			
Reverse Transfer Capacitance	C_{rss}		260			
Total Gate Charge	Q_g	$V_{DS} = -6\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -5.1\text{ A}$		15	25	nC
		$V_{DS} = -6\text{ V}, V_{GS} = -2.5\text{ V}, I_D = -5.1\text{ A}$		9	15	
Gate-Source Charge	Q_{gs}		1.9			
Gate-Drain Charge	Q_{gd}		3.8			
Gate Resistance	R_g	$f = 1\text{ MHz}$		4.0		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6\text{ V}, R_L = 6\text{ }\Omega$ $I_D = -1\text{ A}, V_{GEN} = -4.5\text{ V}, R_G = 1\text{ }\Omega$		13	20	ns
Rise Time	t_r		35	60		
Turn-Off Delay Time	$t_{d(off)}$		45	70		
Fall Time	t_f		12	20		
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			- 1.0	A
Pulse Diode Forward Current ^a	I_{SM}				- 20	
Body Diode Voltage	V_{SD}	$I_S = -1.0\text{ A}$		- 0.7	- 1.2	V
Body Diode Reverse Recovery Time	t_{rr}	$I_F = -1.0\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		32	50	ns
Body Diode Reverse Recovery Charge	Q_{rr}		20	40	nC	
Reverse Recovery Fall Time	t_a		16		ns	
Reverse Recovery Rise Time	t_b		16			

Notes:

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

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