TY Semicondutor® TY

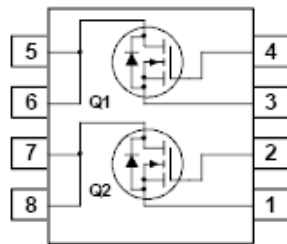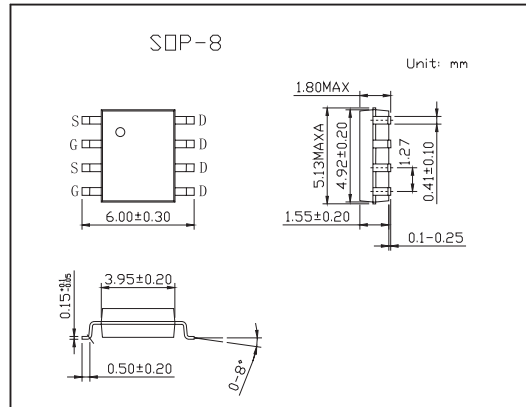# KDS3912

■ Features

● 3 A, 100 V. $R_{DS(ON)}$ = 125mΩ @ V_{GS} = 10 V

$R_{DS(ON)}$ = 135mΩ @ V_{GS} = 6 V

● Low gate charge (14 nC typical)

● Fast switching speed

● High performance trench technology for extremely low $R_{DS(ON)}$

● High power and current handling capability

SOP-8

Unit: mm

■ Absolute Maximum Ratings Ta = 25℃

| Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DSS}	100	V
Gate to Source Voltage	V_{GS}	$\pm$20	V
Drain Current Continuous (Note 1a)	I_D	3	A
Drain Current Pulsed		20	A
Power Dissipation for Dual Operation	P_D	1.6	W
Power Dissipation for Single Operation (Note 1a)	P_D	1	W
Power Dissipation for Single Operation (Note 1b)		0.9	
Power Dissipation for Single Operation (Note 1c)		0.9	
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	℃
Thermal Resistance Junction to Case (Note 1)	$R_{\theta JC}$	40	℃/W
Thermal Resistance Junction to Ambient (Note 1a)	$R_{\theta JA}$	78	℃/W

KDS3912

■ Electrical Characteristics Ta = 25℃

| Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Single Pulse Drain-Source Avalanche Energy	WDSS	Single Pulse,VDD=50V,ID=3A(Not 2)			90	mJ
Maximum Drain-Source Avalanche Current	IAR	(Not 2)			3.0	A
Drain-Source Breakdown Voltage	BVDSS	VGS = 0 V, ID = 250 μA	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	ID = 250 μA, Referenced to 25℃		108		mV/℃
Zero Gate Voltage Drain Current	IDSS	VDS = 80 V, VGS = 0 V			10	μA
Gate-Body Leakage, Forward	IGSSF	VGS = 20 V, VDS = 0 V			100	nA
Gate-Body Leakage, Reverse	IGSSR	VGS = -20 V, VDS = 0 V			-100	nA
Gate Threshold Voltage	VGS(th)	VDS = VGS, ID = 250 μA	2	2.5	4	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	ID = 250 μA, Referenced to 25℃		-6		mV/℃
Static Drain-Source On-Resistance	RDS(on)	VGS = 10 V, ID = 3 A		92	125	mΩ
		VGS = 6 V, ID = 2.8 A		98	135	
		VGS = 10 V, ID =3 A,TJ = 125℃		175	250	
On-State Drain Current	ID(on)	VGS = 10 V, VDS = 10V	10			A
Forward Transconductance	gFS	VDS = 10 V, ID = 3A		11		S
Input Capacitance	Ciss			632		pF
Output Capacitance	Coss	VDS = 50 V, VGS = 0 V,f = 1.0 MHz		40		pF
Reverse Transfer Capacitance	Crss			20		pF
Turn-On Delay Time	td(on)			8.5	17	ns
Turn-On Rise Time	tr	VDD = 50 V, ID = 1 A,VGS = 10 V,		2	4	ns
Turn-Off Delay Time	td(off)	RGEN = 6 Ω		23	37	ns
Turn-Off Fall Time	tf			4.5	9	ns
Total Gate Charge	Qg			14	20	nC
Gate-Source Charge	Qgs	VDS = 50 V, ID = 3 A,VGS = 10 V (Note 2)		2.4		nC
Gate-Drain Charge	Qgd			3.8		nC
Maximum Continuous Drain-Source Diode Forward Current	Is				1.3	A
Drain-Source Diode Forward Voltage	VSD	VGS = 0 V, Is = 1.3 A (Not 2)		0.76	1.2	V
Diode Reverse Recovery Time	trr	IF = 3A		30		nS
Diode Reverse Recovery Charge	Qrr	diF/dt = 100 A/μs (Not 2)		106		nC

Notes:

1. R$_{θJA}$ is the sum of the junction-to-case and case-to-ambient thermal resistance where the case thermal reference is defined as the solder mounting surface of the drain pins. R$_{θJC}$ is guaranteed by design while R$_{θCA}$ is determined by the user's board design.
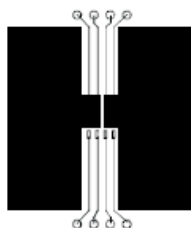
a) 78°C/W when mounted on a 0.5in² pad of 2 oz copper

b) 125°C/W when mounted on a 0.02 in² pad of 2 oz copper
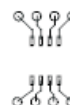
c) 135°C/W when mounted on a minimum pad.

2. Pulse Test: Pulse Width < 300μs, Duty Cycle < 2.0%