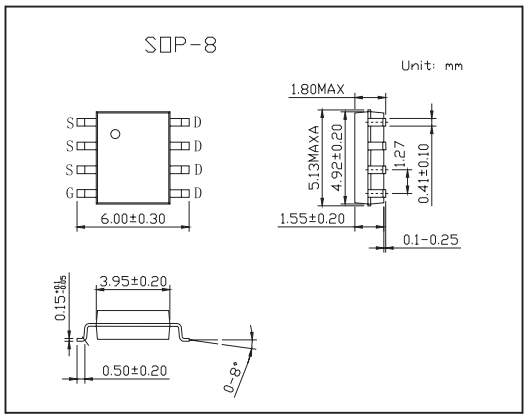
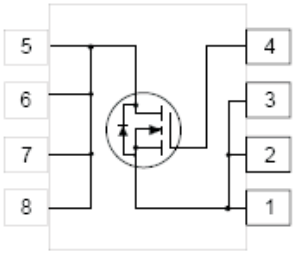
60V N-Channel PowerTrench™ MOSFET

KDS5670



■ Features

- 10 A, 60 V. $R_{DS(ON)}$ = 0.014 Ω @ V_{GS} = 10 V
  $R_{DS(ON)}$ = 0.017 Ω @ V_{GS} = 6 V
- Low gate charge
- Fast switching speed.
- High performance trench technology for extremely low $R_{DS(ON)}$
- High power and current handling capability



■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DSS}	60	V
Gate to Source Voltage	V_{GS}	±20	V
Drain Current Continuous (Note 1a)	I_D	10	A
Drain Current Pulsed		50	A
Power dissipation (Note 1a)	P_D	2.5	W
Power dissipation (Note 1b)		1.2	
Power dissipation (Note 1c)		1	
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 175	℃
Thermal Resistance Junction to Ambient (Note 1a)	$R_{\theta JA}$	50	℃/W
Thermal Resistance Junction to Case (Note 1)	$R_{\theta JC}$	25	℃/W

KDS5670

■ Electrical Characteristics Ta = 25℃

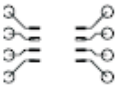
Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	B_{VDSS}	V_{GS} = 0 V, I_D = 250 μA	60			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I_D = 250 μA, Referenced to 25℃		58		mV/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48 V, V_{GS} = 0 V			1	μA
Gate-Body Leakage, Forward	I_{GSSF}	V_{GS} = 20 V, V_{DS} = 0 V			100	nA
Gate-Body Leakage, Reverse	I_{GSSR}	V_{GS} = -20 V, V_{DS} = 0 V			-100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2	2.4	4	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I_D = 250 μA, Referenced to 25℃		6.8		mV/℃
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 10 A		0.012	0.014	Ω
		V_{GS} = 10 V, I_D =10 A,T_J = 125℃		0.019	0.027	
		V_{GS} = 6 V, I_D =9 A		0.014	0.017	
On-State Drain Current	$I_{D(on)}$	V_{GS} = 10 V, V_{DS} = 5V	25			A
Forward Transconductance	g_{FS}	V_{DS} =5V, I_D =10 A		39		S
Input Capacitance	C_{iss}	V_{DS} = 15 V, V_{GS} = 0 V,f = 1.0 MHz		2900		pF
Output Capacitance	C_{oss}			685		pF
Reverse Transfer Capacitance	C_{rss}			180		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V, I_D = 1 A,V_{GS} = 10 V, R_{GEN} = 6 Ω (Note 2)		16	29	ns
Turn-On Rise Time	tr			10	20	ns
Turn-Off Delay Time	$t_{d(off)}$			50	80	ns
Turn-Off Fall Time	t_f			23	42	ns
Total Gate Charge	Q_g	V_{DS} = 20 V, I_D = 10 A,V_{GS} = 10 V (Note 2)		49	70	nC
Gate-Source Charge	Q_{gs}			9		nC
Gate-Drain Charge	Q_{gd}			10.4		nC
Maximum Continuous Drain-Source Diode Forward Current	I_S				2.1	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 2.1 A (Not 2)		0.72	1.2	V

Notes:

1. $R_{\theta JA}$ 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. $R_{\theta JC}$ is guaranteed by design while $R_{\theta JA}$ is determined by the user's board design.

a) 50° C/W when mounted on a 0.5 in² pad of 2 oz. copper.

b) 105° C/W when mounted on a 0.02 in² pad of 2 oz. copper.



c) 125° C/W when mounted on a minimum pad.

Scale 1 : 1 on letter size paper

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