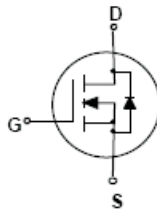
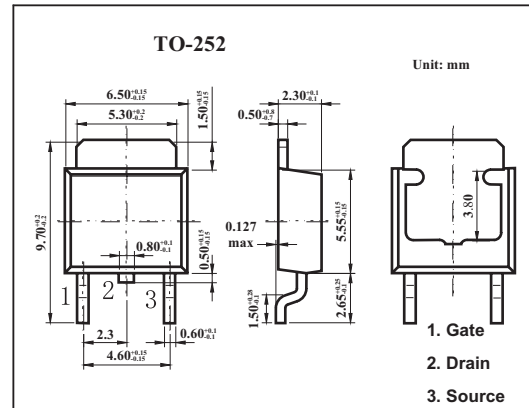


100V N-Channel Power Trench MOSFET

KDD3680

■ Features

- 25 A, 100 V. $R_{DS(ON)} = 46\text{m}\Omega$ @ $V_{GS} = 10\text{ V}$
 $R_{DS(ON)} = 51\text{m}\Omega$ @ $V_{GS} = 6\text{ V}$
- Low gate charge (38 nC typical)
Fast switching speed
- High performance trench technology for extremely low $R_{DS(ON)}$
- High power and current handling capability

■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DS}	100	V
Gate to Source Voltage	V_{GS}	± 20	V
Drain Current Continuous (Note 1)	I_D	25	A
Drain Current Pulsed		100	A
Power dissipation @ $T_c=25^\circ\text{C}$ (Note 1)	P_D	68	W
Power dissipation @ $T_a=25^\circ\text{C}$ (Note 1a)		3.8	
Power dissipation @ $T_a=25^\circ\text{C}$ (Note 1b)		1.6	
Operating and Storage Temperature	T_J, T_{STG}	-55 to 175	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.2	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	96	$^\circ\text{C}/\text{W}$

KDD3680

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Single Pulse Drain-Source Avalanche Energy	W _{DSS}	V _{DD} = 50 V, I _D = 6.1 A (Not 1)			245	mJ
Maximum Drain-Source Avalanche Current	I _{AR}	(Not 1)			6.1	A
Drain-Source Breakdown Voltage	B _V DSS	V _{GS} = 0 V, I _D = 250 μ A	100			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta B_{V_{DSS}}}{\Delta T_J}$	I _D = 250 μ A, Referenced to 25°C		-101		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 80 V, V _{GS} = 0 V			10	μ A
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 μ A	2	2.4	4	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I _D = 250 μ A, Referenced to 25°C		-6.5		mV/°C
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10 V, I _D = 6.1 A		32	46	m Ω
		V _{GS} = 10 V, I _D = 6.1 A, T _J = 125°C		61	92	
		V _{GS} = 6 V, I _D = 5.8 A,		34	51	
On-State Drain Current	I _{D(on)}	V _{GS} = 10 V, V _{DS} = 5 V	25			A
Forward Transconductance	g _{FS}	V _{DS} = 5 V, I _D = 6.1 A		25		S
Input Capacitance	C _{iss}	V _{DS} = 50 V, V _{GS} = 0 V, f = 1.0 MHz		1735		pF
Output Capacitance	C _{oss}			176		pF
Reverse Transfer Capacitance	C _{rss}			53		pF
Turn-On Delay Time	t _{d(on)}			14	25	ns
Turn-On Rise Time	t _r	V _{DD} = 50 V, I _D = 1 A, V _{GS} = 10 V, R _{GEN} = 10 Ω		8.5	17	ns
Turn-Off Delay Time	t _{d(off)}			63	94	ns
Turn-Off Fall Time	t _f			21	34	ns
Total Gate Charge	Q _g			38	53	nC
Gate-Source Charge	Q _{gs}	V _{DS} = 50 V, I _D = 6.1 A, V _{GS} = 10 V (Note 2)		8.1		nC
Gate-Drain Charge	Q _{gd}			9.2		nC
Maximum Continuous Drain-Source Diode Forward Current	I _S				2.9	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 2.9 A (Not 2)		0.73	1.3	V

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) R_{θJA} = 40°C/W when mounted on a 1 in² pad of 2oz copper.



b) R_{θJA} = 86°C/W on a minimum mounting pad.

Scale 1 : 1 on letter size paper

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