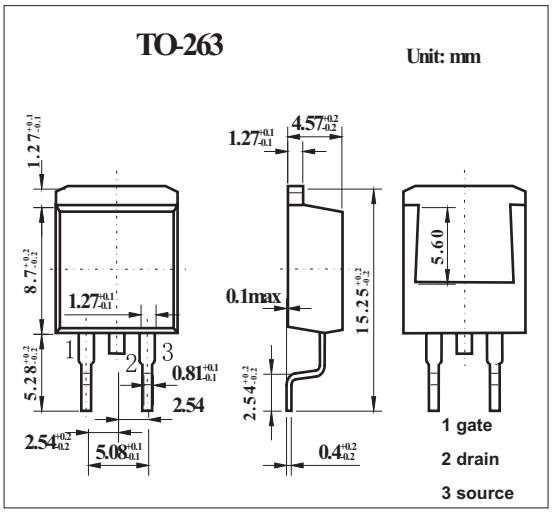
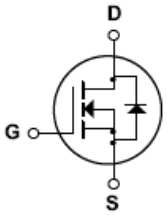
500V N-Channel MOSFET
KQB9N50



■ Features

- 9A, 500 V. $R_{DS(ON)}$ = 0.73Ω @ V_{GS} = 10 V
- Low gate charge (typical 28nC)
- Low Crss(typical 20 pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DSS}	500	V
Drain Current Continuous (Tc=25℃)	I_D	9	A
Drain Current Continuous (Tc=100℃)		5.7	A
Drain Current Pulsed *1	I_{DM}	36	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulsed Avalanche Energy*2	E_{AS}	360	mJ
Avalanche Current *1	I_{AR}	9	A
Repetitive Avalanche Energy *1	E_{AR}	14.7	mJ
Peak Diode Recovery dv/dt *3	dv/dt	4.5	V/ns
Power dissipation @ Ta=25℃	P_D	3.13	W
Power dissipation @ Tc=25℃	P_D	147	W
Derate above 25℃		1.18	W/℃
Operating and Storage Temperature	T_J, T_{STG}	-55 to150	℃
Maximum lead temperature for soldering purposes,1/8" from case for 5 seconds	T_L	300	℃
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.85	℃/W
Thermal Resistance Junction to Ambient *4	$R_{\theta JA}$	40	℃/W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	℃/W

*1 Repetitive Rating:Pulse width limited by maximum junction temperature

*2 l=8mH,I_{AS}=9A,V_{DD}=50V,R_G=25Ω,Startion T_J=25℃

*3 I_{SD}≤9A,di/dt≤200A/μS,V_{DD}≤BV_{DSS},Startiong T_J=25℃

*4 When mounted on the minimum pad size recommended (PCB Mount)

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	500			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I_D = 250 μA, Referenced to 25℃		0.55		mV/℃
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 500 V, V_{GS} = 0 V			1	μA
		V_{DS} =400 V, T_C=125℃			10	μA
Gate-Body Leakage Current,Forward	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V			100	nA
Gate-Body Leakage Current,Reverse	I_{GSSR}	V_{GS} =-30 V, V_{DS} = 0 V			-100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	3.0		5.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 4.5A		0.58	0.73	Ω
Forward Transconductance	g_{FS}	V_{DS} = 50 V, I_D = 4.5A *		8.2		S
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V,f = 1.0 MHz		1100	1450	pF
Output Capacitance	C_{oss}			160	210	pF
Reverse Transfer Capacitance	C_{rss}			20	30	pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 250 V, I_D = 9.0A,RG=25Ω *		25	60	ns
Turn-On Rise Time	tr			95	200	ns
Turn-Off Delay Time	$t_{d(off)}$			55	120	ns
Turn-Off Fall Time	tf			60	130	ns
Total Gate Charge	Q_g	V_{DS} = 400 V, I_D = 9.0A,V_{GS} = 10 V *		28	36	nC
Gate-Source Charge	Q_{gs}			7.0		nC
Gate-Drain Charge	Q_{gd}			12.5		nC
Maximum Continuous Drain-Source Diode Forwrad Current	I_S				9.0	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				36	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 9.0 A			1.4	V
Diode Reverse Recovery Time	t_{rr}	V_{GS} = 0 V,dI_F/dt = 100 A/μs,I_S=9.0A*		300		ns
Diode Reverse Recovery Current	Q_{rr}			2.2		μC

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