400V N-Channel MOSFET
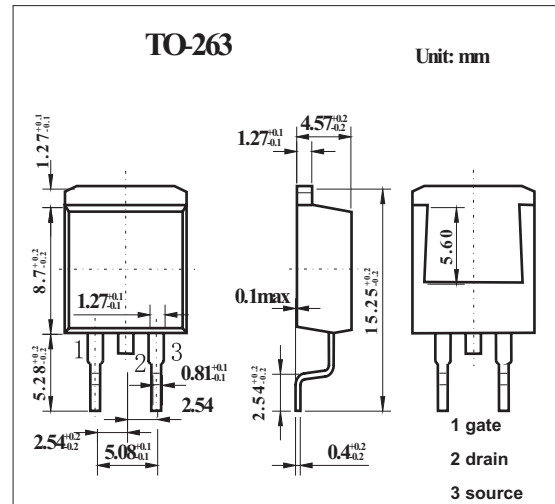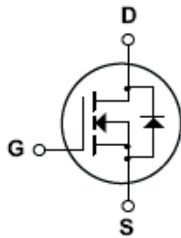# KQB3N40

■ Features

● 2.5A, 400 V. $R_{DS(ON)}$ = 3.4 Ω @ V_{GS} = 10 V

● Low gate charge (typical 6.0nC)

● Low Crss(typical 4.2pF)

● Fast switching

● 100% avalanche tested

● Improved dv/dt capability

TO-263   Unit: mm

1 gate
2 drain
3 source

■ Absolute Maximum Ratings Ta = 25℃

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DSS}	400	V
Drain Current Continuous (Tc=25℃)	I_D	2.5	A
Drain Current Continuous (Tc=100℃)		1.58	A
Drain Current Pulsed *1	I_{DM}	10	A
Gate-Source Voltage	V_{GSS}	±30	V
Single Pulsed Avalanche Energy*2	E_{AS}	120	mJ
Avalanche Current *1	I_{AR}	2.5	A
Repetitive Avalanche Energy *1	E_{AR}	5.5	mJ
Peak Diode Recovery dv/dt *3	dv/dt	4.5	V/ns
Power dissipation @ T_A=25℃	P_D	3.13	W
Power dissipation @ Tc=25℃	P_D	55	W
Derate above 25℃		0.44	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	$R_{θJC}$	2.27	℃/W
Thermal Resistance Junction to Ambient *4	$R_{θJA}$	40	℃/W
Thermal Resistance Junction to Ambient	$R_{θJA}$	62.5	℃/W

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

*2 I=34mH,I_{AS}=2.5A,V_{DD}=50V,R_G=25Ω,Startion T_J=25℃

*3 I_{SD}≤2.5A,d_I/d_t≤200A/μS,V_{DD}≤B_{VDSS},Startiong T_J=25℃

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

KQB3N40

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0$ V, $I_D = 250\mu$A	400			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	$I_D = 250\mu$A, Referenced to 25℃		0.4		mV/℃
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 400$ V, $V_{GS} = 0$ V			1	μA
		$V_{DS} = 320$ 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	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu$A	3.0		5.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10$ V, $I_D = 1.25$A		2.6	3.4	Ω
Forward Transconductance	g_{FS}	$V_{DS} = 50$ V, $I_D = 1.25$A *		1.7		S
Input Capacitance	C_{iss}	$V_{DS} = 25$ V, $V_{GS} = 0$ V,f = 1.0 MHz		180	230	pF
Output Capacitance	C_{oss}			35	45	pF
Reverse Transfer Capacitance	C_{rss}			4.2	6	pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 200$ V, $I_D = 2.5$A,$R_G=25\Omega$*		9	25	ns
Turn-On Rise Time	tr			40	90	ns
Turn-Off Delay Time	$t_{d(off)}$			10	30	ns
Turn-Off Fall Time	tf			25	60	ns
Total Gate Charge	Q_g	$V_{DS} = 320$ V, $I_D = 2.5$A,$V_{GS} = 10$ V *		6.0	7.5	nC
Gate-Source Charge	Q_{gs}			1.6		nC
Gate-Drain Charge	Q_{gd}			2.8		nC
Maximum Continuous Drain-Source Diode Forwrad Current	I_S				2.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}				10	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0$ V, $I_S = 2.5$ A			1.5	V
Diode Reverse Recovery Time	trr	$V_{GS} = 0$ V,$dI_F/dt = 100$ A/μs,I_S=2.5A *		170		ns
Diode Reverse Recovery Current	Qrr			0.64		nC

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

KEXIN