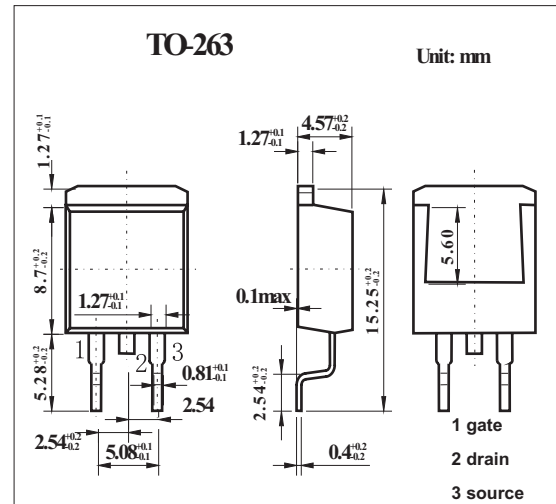
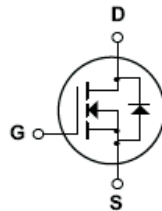


500V N-Channel MOSFET KQB4N50

■ Features

- 3.4A, 500 V. $R_{DS(ON)} = 2.7 \Omega$ @ $V_{GS} = 10 \text{ V}$
- Low gate charge (typical 10nC)
- Low C_{rss} (typical 6.0pF)
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



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

Parameter	Symbol	Rating	Unit
Drain to Source Voltage	V_{DS}	500	V
Drain Current Continuous ($T_c=25^\circ\text{C}$)	I_D	3.4	A
Drain Current Continuous ($T_c=100^\circ\text{C}$)		2.15	A
Drain Current Pulsed *1	I_{DM}	13.6	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy*2	E_{AS}	260	mJ
Avalanche Current *1	I_{AR}	3.4	A
Repetitive Avalanche Energy *1	E_{AR}	7	mJ
Peak Diode Recovery dv/dt *3	dv/dt	4.5	V/ns
Power dissipation @ $T_A=25^\circ\text{C}$	P_D	3.13	W
Power dissipation @ $T_c=25^\circ\text{C}$		70	W
Derate above 25°C		0.56	W/ $^\circ\text{C}$
Operating and Storage Temperature	T_J, T_{STG}	-55 to 150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	300	$^\circ\text{C}$
Thermal Resistance Junction to Case	$R_{\theta JC}$	1.79	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient *4	$R_{\theta JA}$	40	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

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

*2 $I = 40\text{mA}$, $I_{AS} = 3.4\text{A}$, $V_{DD} = 50\text{V}$, $R_G = 25 \Omega$, Startion $T_J = 25^\circ\text{C}$

*3 $I_{SD} \leq 3.4\text{A}$, $d_i/d_t \leq 200\text{A}/\mu\text{S}$, $V_{DD} \leq B_{VDS}$, Startiong $T_J = 25^\circ\text{C}$

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

KQB4N50

■ Electrical Characteristics Ta = 25°C

Parameter	Symbol	Testconditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	B _{VDS}	V _{GS} = 0 V, I _D = 250 μA	500			V
Breakdown Voltage Temperature Coefficient	$\frac{\Delta B_{VDS}}{\Delta T_J}$	I _D = 250 μA, Referenced to 25°C		0.38		mV/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 500 V, V _{GS} = 0 V			1	μA
		V _{DS} = 400 V, T _C = 125°C			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 = 1.7 A		2.0	2.7	Ω
Forward Transconductance	g _{FS}	V _{DS} = 50 V, I _D = 1.7 A *		2.9		S
Input Capacitance	C _{iss}	V _{DS} = 25 V, V _{GS} = 0 V, f = 1.0 MHz		350	230	pF
Output Capacitance	C _{oss}			55	45	pF
Reverse Transfer Capacitance	C _{rss}			6	6	pF
Turn-On Delay Time	t _{d(on)}	V _{DD} = 250 V, I _D = 3.4 A, R _G = 25 Ω *		12	30	ns
Turn-On Rise Time	t _r			45	100	ns
Turn-Off Delay Time	t _{d(off)}			20	50	ns
Turn-Off Fall Time	t _f			30	70	ns
Total Gate Charge	Q _g	V _{DS} = 400 V, I _D = 3.4 A, V _{GS} = 10 V *		10	13	nC
Gate-Source Charge	Q _{gs}			2.5		nC
Gate-Drain Charge	Q _{gd}			4.7		nC
Maximum Continuous Drain-Source Diode Forward Current	I _S				3.4	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}				13.6	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} = 0 V, I _S = 3.4 A			1.4	V
Diode Reverse Recovery Time	t _{rr}	V _{GS} = 0 V, dI _F /dt = 100 A/μs, I _S = 3.4 A *		210		ns
Diode Reverse Recovery Current	Q _{rr}			1.15		nC

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