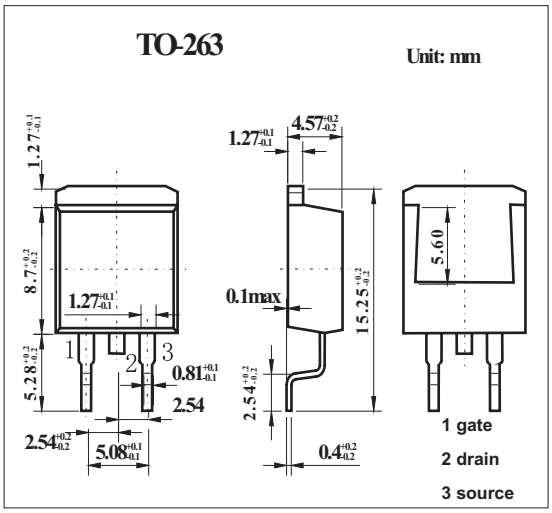
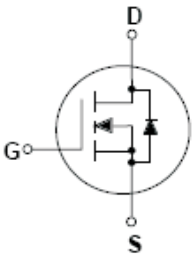
N-Channel PowerTrench™MOSFET

KDB5690



Features

- 32 A, 60 V. $R_{DS(ON)}$ = 0.027Ω @ V_{GS} = 10 V
  $R_{DS(ON)}$ = 0.032Ω @ V_{GS} = 6 V
- Critical DC electrical parameters specified at elevated temperature.
- Rugged internal source-drain diode can eliminate the need for an external Zener diode transient suppressor.
- High performance trench technology for extremely low $R_{DS(ON)}$.
- 175℃ maximum junction temperature rating.



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	I_D	32	A
Drain Current Pulsed		100	A
Power dissipation @ T_C=25℃	P_D	58	W
Derate above 25℃	P_D	0.4	W/℃
Operating and Storage Temperature	T_J, T_{STG}	-65 to 175	℃
Thermal Resistance Junction to Case	$R_{\theta JC}$	2.6	℃/W
Thermal Resistance Junction to Ambient	$R_{\theta JA}$	62.5	℃/W

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■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Testconditons	Min	Typ	Max	Unit
Single Pulse Drain-Source Avalanche Energy *	W_{DSS}	V_{DD} = 30 V, I_D = 32A			80	mJ
Maximum Drain-Source Avalanche Current	I_{AR}				32	A
Drain□Source Breakdown Voltage	BV_{DSS}	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℃		61		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	2.5	4	V
Gate Threshold Voltage Temperature Coefficient	$\frac{\Delta V_{GS(th)}}{\Delta T_J}$	I_D = 250 μA, Referenced to 25℃		-6.4		mV/℃
Static Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 16 A		0.021	0.027	mΩ
		V_{GS} = 10 V, I_D = 16 A,TJ = 125℃		0.042	0.055	
		V_{GS} = 6 V, I_D =15 A,		0.024	0.032	
On□State Drain Current	$I_{D(on)}$	V_{GS} = 10 V, V_{DS} = 5 V	50			A
Forward Transconductance	g_{FS}	V_{DS} = 5 V, I_D = 16 A		32		S
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V,f = 1.0 MHz		1120		pF
Output Capacitance	C_{oss}			160		pF
Reverse Transfer Capacitance	C_{rss}			80		pF
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V, I_D = 1 A,V_{GS} = 10 V, R_{GEN} = 6 Ω*		10	18	ns
Turn-On Rise Time	tr			9	18	ns
Turn-Off Delay Time	$t_{d(off)}$			24	39	ns
Turn-Off Fall Time	tf			10	18	ns
Total Gate Charge	Q_g	V_{DS} = 1 V, I_D = 16 A,V_{GS} = 10 V *		23	33	nC
Gate□Source Charge	Q_{gs}			3.9		nC
Gate□Drain Charge	Q_{gd}			6.8		nC
Maximum Continuous Drain-Source Diode Forward Current	I_S				32	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 16 A *		0.92	1.2	V

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