500V N-Channel Power MOSFET

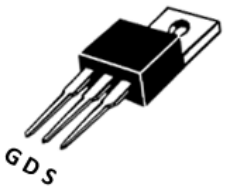
DESCRIPTION：

- Super high dense cell design for extremely low $R_{DS(ON)}$
- High power and current handing capability
- Proprietary New Trench Technology
- $R_{DS(ON),typ.}$=0.8Ω@V_{GS}=10V
- RoHS compliant

V_{DS}	500V
I_D	8.7A
$R_{DS(ON)\_Max}$	0.8Ω

TYPICAL APPLICATIONS：

- Synchronous Rectification
- Power Management
- Load Switch



TO-220AB

MAXIMUM RATINGS (at T_C = 25 °C, unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	500	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	Tc=25℃ Tc=100℃	I_D	8.7 6.1	A
Pulsed Drain Current (1)		I_{DM}	34.8	A
Power dissipation	Tc=25℃ Derate above 25 C	P_D	150 1	W W/℃
Single Pulsed Avalanche Energy	L = 10mH, I_{AS} = 7A, V_{DD} = 60V, R_G = 25Ω, Starting T_J = 25 C	E_{AS}	245	mJ
Single Pulsed Avalanche Current	L = 10mH, I_{AS} = 7A, V_{DD} = 60V, R_G = 25Ω, Starting T_J = 25 C	I_{AS}	7	A
Junction & Storage temperature Range		T_J, T_{STG}	-55~+175	℃

Notes： 1. Repetitive rating; pulse width limited by maximum junction temperature.

THERMAL CHARACTERISTICS

Characteristic	Condition	Symbol	Value	Unit
Thermal resistance,	Junction – Ambient Junction - Case	$R_{\theta(j-A)}$ $R_{\theta(j-C)}$	62.5 1.0	℃/W

ELECTRICAL CHARATERISTICS (at T_J = 25 °C, unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	BV_{DSS}	500			V
Zero Gate Voltage Drain Current VDS = 500 V, VGS = 0 V Tj=25℃	I_{DSS}			1	uA
Gate-Source Leakage Current VGS = ±30V, VDS = 0V	I_{GSS}			±100	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	$V_{GS(th)}$	2.0		4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 4.3A	$R_{DS(on)}$		0.66	0.8	Ω
Input capacitance f=1MHz, VDS=25 V, VGS=0 V	C_{iss}		955		pF
Output capacitance f=1MHz, VDS=25 V, VGS=0 V	C_{oss}		140		pF
Reverse transfer capacitance f=1MHz, VDS=25 V, VGS=0 V	C_{rss}		15		pF
Total Gate Charge VDD= 400V, ID= 7A,VGS= 10V	Q_G		22		nC
Gate to Source Charge VDD= 400V, ID= 7A,VGS= 10V	Q_{GS}		4		nC
Gate to Drain Charge VDD= 400V, ID= 7A,VGS= 10V	Q_{GD}		9		nC
Turn-on delay time VDD=250 V, VGS= 10V, ID= 4A, R_{GEN}=9.1Ω	$td_{(ON)}$		25		ns
Turn-on Rise time VDD=250 V, VGS= 10V, ID= 4A, R_{GEN}=9.1Ω	tr		7		ns
Turn-off delay time VDD=250 V, VGS= 10V, ID= 4A, R_{GEN}=9.1Ω	$td_{(OFF)}$		46		ns
Turn-off Fall time VDD=250 V, VGS= 10V, ID= 4A, R_{GEN}=9.1Ω	tf		8		ns

Typical Characteristics

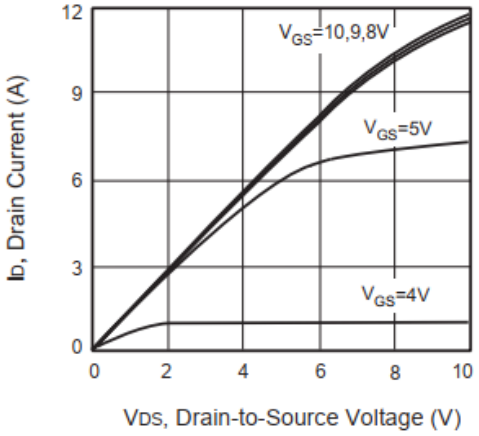


Figure 1. Output Characteristics

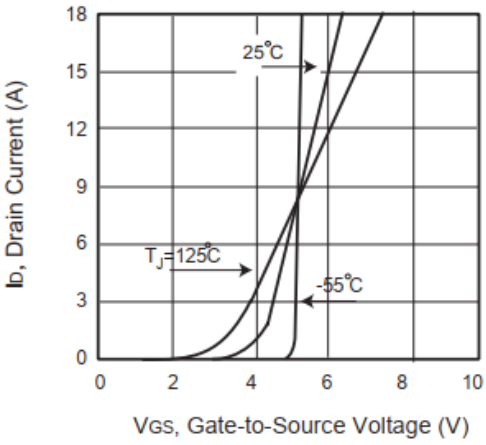


Figure 2. Transfer Characteristics

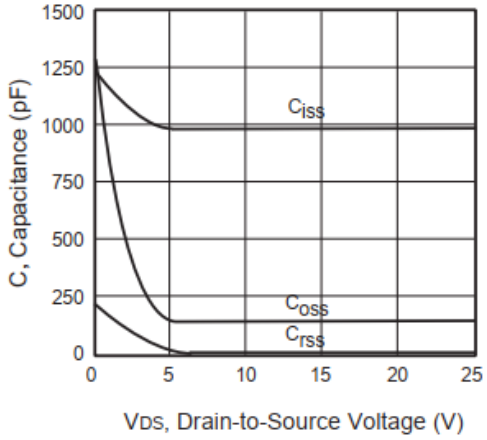


Figure 3. Capacitance

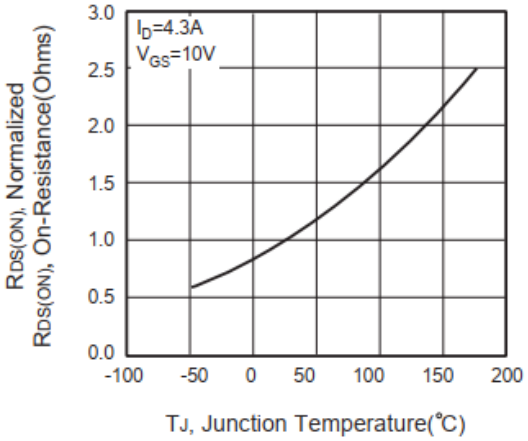


Figure 4. On-Resistance Variation with Temperature

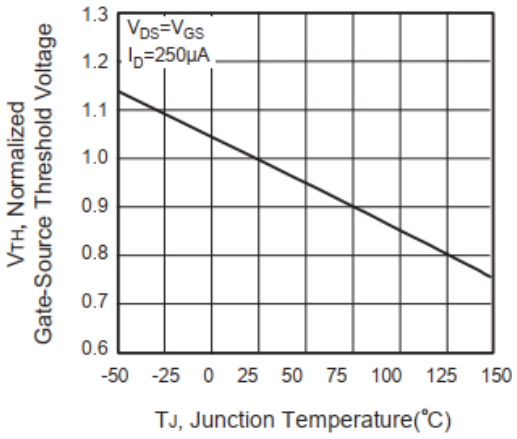


Figure 5. Gate Threshold Variation with Temperature

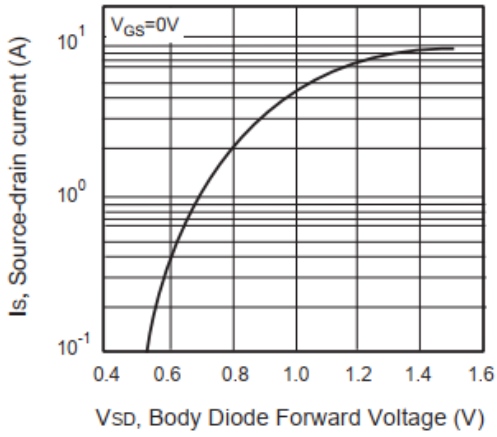


Figure 6. . Body Diode Forward Voltage Variation with Source Curren

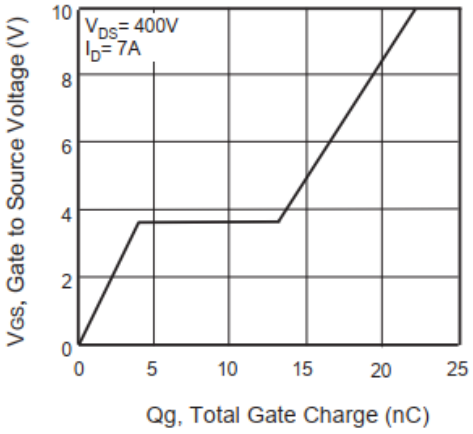


Figure 7. Gate Charge Characteristics

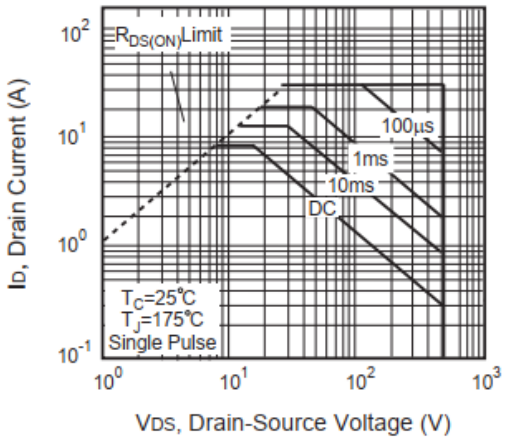


Figure 8. Maximum Safe Operating Area

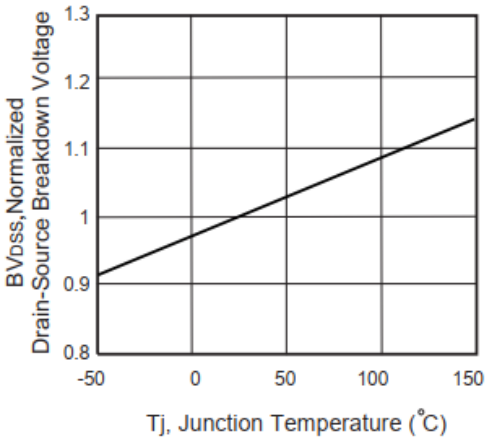


Figure 9. Breakdown Voltage Variation vs. Temperature

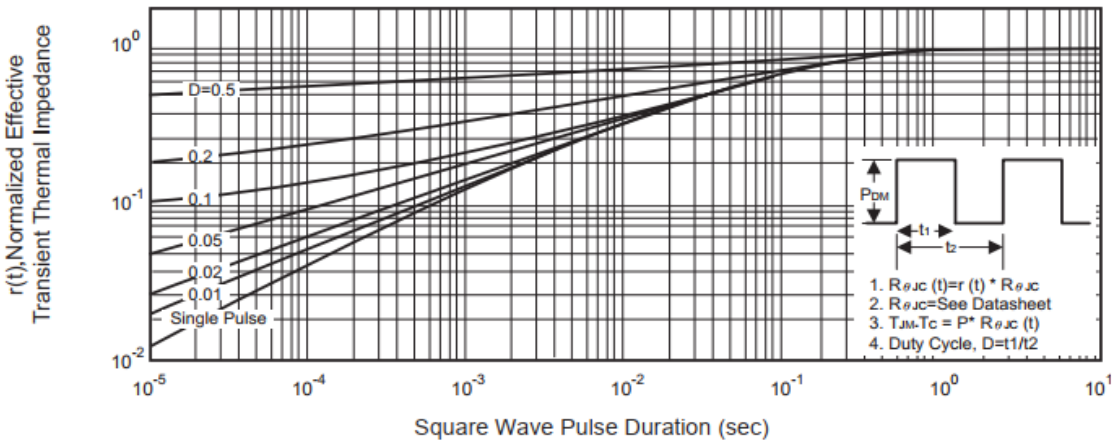
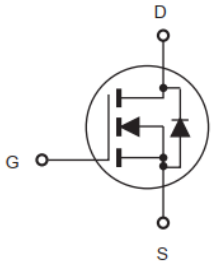
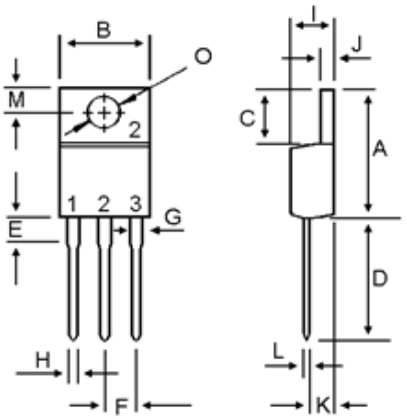


Figure 10. Normalized Thermal Transient Impedance Curve

• Circuit diagram



• TO-220AB Package outlines : Dimensions in (mm)



DIM	MILLIMETERS	
	MIN	MAX
A	14.68	16.20
B	9.78	10.42
C	5.02	6.60
D	13.00	14.62
E	3.10	4.19
F	2.41	2.67
G	1.10	1.67
H	0.69	1.01
I	4.22	4.98
J	1.14	1.40
K	2.20	3.30
L	0.28	0.61
M	2.48	3.00
O	3.40	4.00

Notice

MOSPEC reserves the rights to make changes of the content herein the document anytime without notification. MOSPEC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies. Please refer to MOSPEC website for the last document.

MOSPEC disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially incurred.

Application shown on the herein document are examples of standard use and operation. Customers are responsible for comprehending suitable use in particular applications. MOSPEC makes no representation or warranty that such application will be suitable for the specified use without further testing or modification.

The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by MOSPEC for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of MOSPEC or others.

These MOSPEC products are intended for usage in general electronic equipment. Please make sure to consult with MOSPEC before you use these MOSPEC products in equipment which require specialized quality and/or reliability, and in equipment which could have major impact to the welfare of human life (atomic energy control, aeronautics , traffic control, combustion control, safety devices etc.)