

## 100V N-Channel Power MOSFET

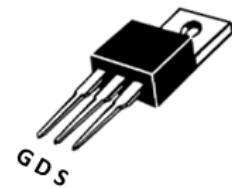
### DESCRIPTION :

- Fast Recovery Body Diode
- Low Gate Charge Minimize Switching Loss
- Proprietary New Trench Technology
- $R_{DS(ON),typ.}=3.6m\Omega@V_{GS}=10V$
- RoHS compliant

$BV_{DSS}$	100V
$I_D$	160A
$R_{DS(ON) typ.}$	3.6m $\Omega$

### TYPICAL APPLICATIONS :

- Synchronous Rectification
- Power Management
- Load Switch



TO-220AB

### MAXIMUM RATINGS (at $T_C = 25^\circ C$ , unless otherwise specified)

Characteristic	Condition	Symbol	Value	Unit
Drain-Source Voltage		$V_{DSS}$	100	V
Gate-Source Voltage		$V_{GSS}$	$\pm 20$	V
Continuous Drain Current	$T_C=25^\circ C$ $T_C=100^\circ C$	$I_D$	160 113	A
Pulsed Drain Current <sup>(1)</sup>	$V_{GS}=10V$	$I_{DM}$	550	A
Single Pulsed Avalanche Energy	$L=1.0mH$	$E_{AS}$	1000	mJ
Power dissipation	$T_C=25^\circ C$	$P_D$	250	W
Junction & Storage temperature Range		$T_J, T_{STG}$	-55~+150	$^\circ C$

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 0.5	$^\circ C/W$

ELECTRICAL CHARACTERISTICS (at  $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage VGS = 0V, ID = 250uA	BV <sub>DSS</sub>	100			V
Zero Gate Voltage Drain Current VDS = 100 V, VGS = 0 V Tj=25°C	I <sub>DSS</sub>			1	uA
Gate-Source Leakage Current VGS = ±20V, VDS = 0V	I <sub>GSS</sub>			±500	nA
Gate-Source threshold voltage VDS = VGS, ID = 250uA	V <sub>GS(th)</sub>	2.0		4.0	V
Drain-Source On-State Resistance VGS = 10V, ID = 20A	R <sub>DS(on)</sub>		3.6	4.1	mΩ
Input capacitance f=1MHz, VDS=50 V, VGS=0 V	C <sub>iss</sub>		6347		pF
Output capacitance f=1MHz, VDS=50 V, VGS=0 V	C <sub>oss</sub>		1152		pF
Reverse transfer capacitance f=1MHz, VDS=50 V, VGS=0 V	C <sub>rss</sub>		58		pF
Total Gate Charge VDD= 50V, ID= 50A, VGS= 10V	Q <sub>G</sub>		78		nC
Gate to Source Charge VDD= 50V, ID= 50A, VGS= 10V	Q <sub>GS</sub>		30		nC
Gate to Drain Charge VDD= 50V, ID= 50A, VGS= 10V	Q <sub>GD</sub>		12		nC
Turn-on delay time VDD=50 V, VGS= 10V, ID= 50A, R <sub>GEN</sub> =2.35Ω	t <sub>d(ON)</sub>		28		ns
Turn-on Rise time VDD=50 V, VGS= 10V, ID= 50A, R <sub>GEN</sub> =2.35Ω	t <sub>r</sub>		16		ns
Turn-off delay time VDD=50 V, VGS= 10V, ID= 50A, R <sub>GEN</sub> =2.35Ω	t <sub>d(OFF)</sub>		50		ns
Turn-off Fall time VDD=50 V, VGS= 10V, ID= 50A, R <sub>GEN</sub> =2.35Ω	t <sub>f</sub>		16		ns

## Body Diode

ELECTRICAL CHARACTERISTICS (at  $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise specified)

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Diode Forward Voltage $V_{GS} = 0V, I_S = 40A$	$V_{SD}$			1.2	V
Continuous Source Current	$I_{SD}$			160	A
Revers Recovery Time $I_F = 50A, dI_F/dt = 100A/\mu s$	$T_{rr}$		91		ns
Revers Recovery Charge $I_F = 50A, dI_F/dt = 100A/\mu s$	$Q_{rr}$		93		nC

Typical Characteristics

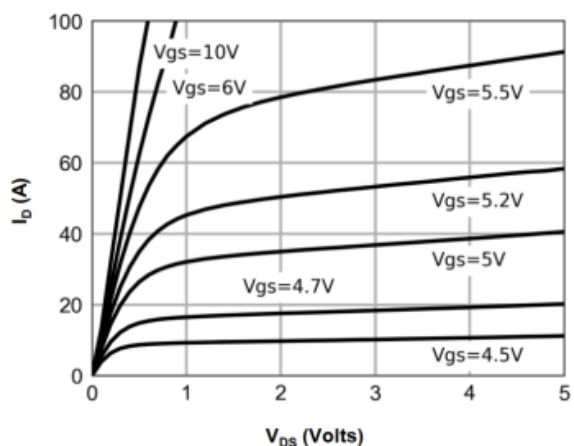


Figure 1. On-Region Characteristics

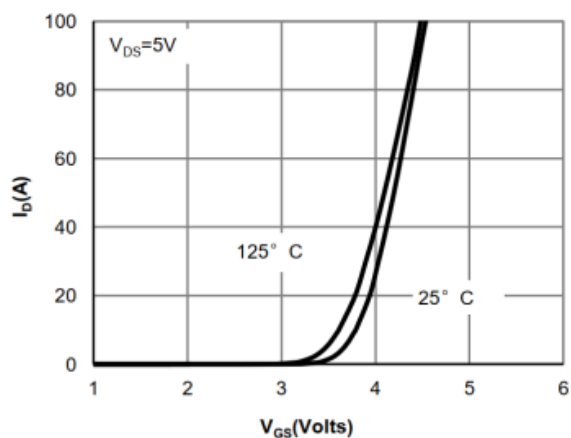


Figure 2. Transfer Characteristics

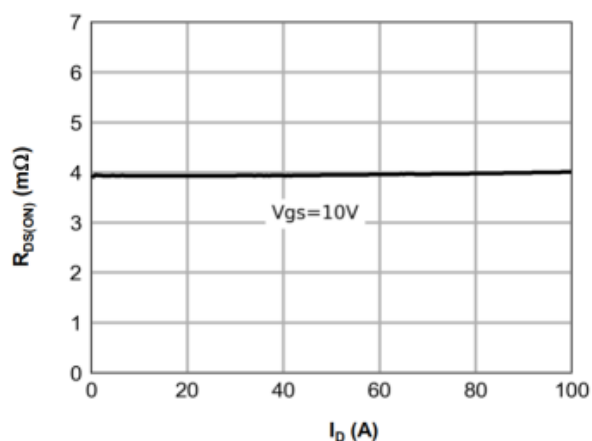


Figure 3. On-resistance vs. Drain Current and Gate Voltage

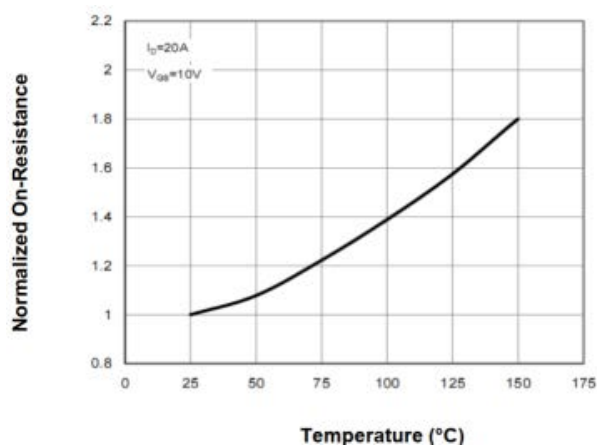


Figure 4. On-resistance vs. Junction Temperature

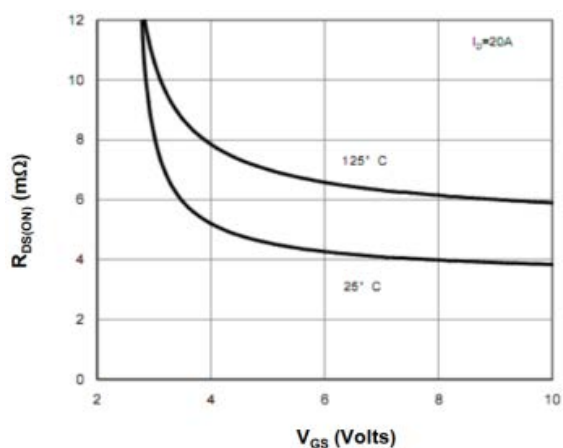


Figure 5. On-resistance vs. Gate-Source Voltage

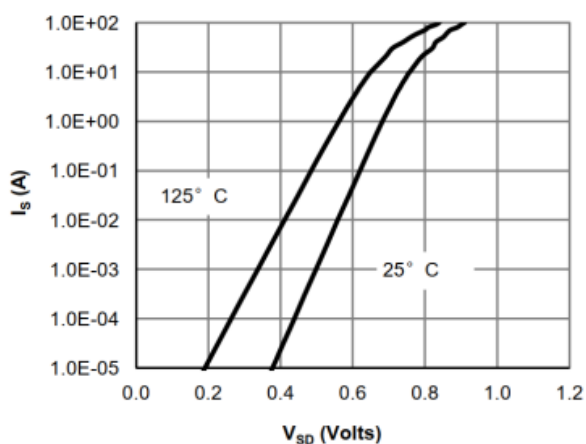


Figure 6. Body-Diode Characteristics

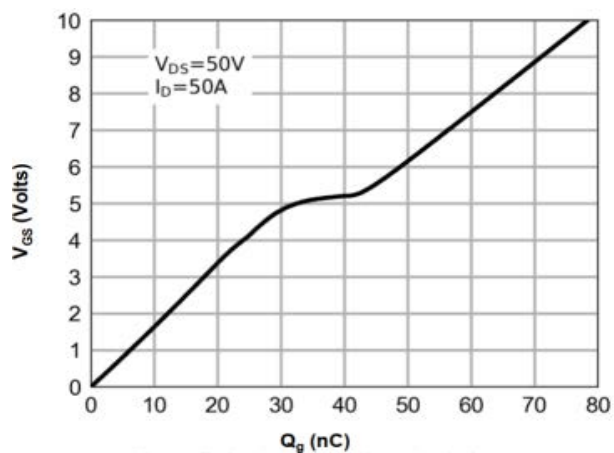


Figure 7. Gate Charge Characteristics

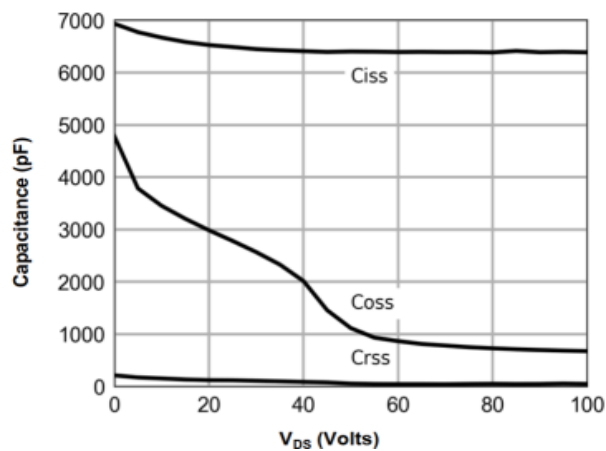


Figure 8. Capacitance Characteristics

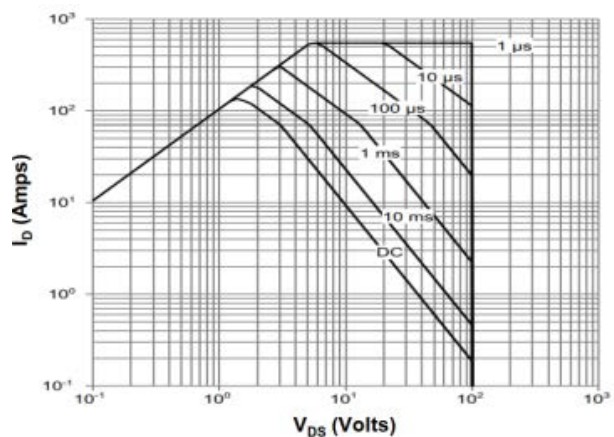
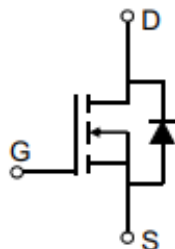
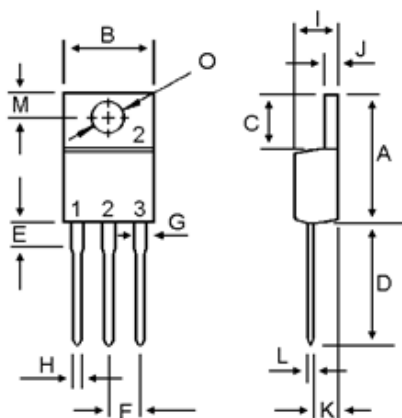


Figure 9. Safe Operating Area

- 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

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