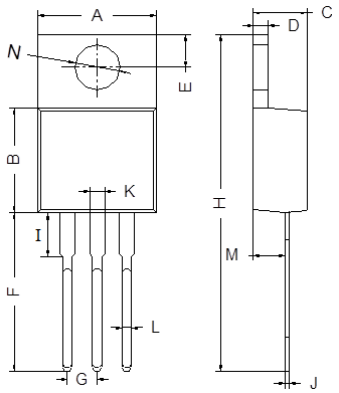
10N60

10A N-Channel Power MOSFET

Features

New technology for high voltage device
Low on-resistance and low conduction losses
Small package
Ultra Low Gate Charge cause lower driving requirements
100% Avalanche Tested
ROHS compliant

TO-220AB



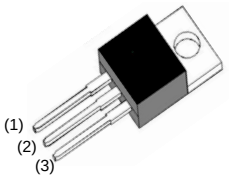
TO-220AB		
Dim	Min	Max
A	9.80	10.30
B	8.30	8.90
C	4.37	4.77
D	1.10	1.45
E	2.62	2.87
F	13.14	13.74
G	2.41	2.67
H	28.40	29.16
I	3.55	4.05
J	0.35	0.58
K	1.20	1.32
L	0.68	0.94
M	2.40	2.60
N	3.71	3.91
All Dimensions in mm		

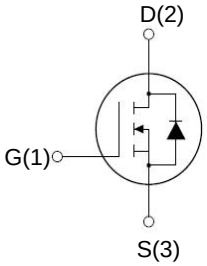
Mechanical Data

Case : TO-220AB
Terminals : Solder plated, solderable per MIL-STD-750, Method 2026
Polarity : As marked
Mounting Position : Any

Application

Power factor correction（PFC）
Switched mode power supplies(SMPS)
Uninterruptible Power Supply（UPS）





Maximum Ratings And Electrical Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified. Single phase half-wave 60Hz,resistive or inductive load, for capacitive load current derate by 20%.

Table 1. Absolute Maximum Ratings (T_C=25℃)

Parameter	Symbol	10N60	Unit
Drain-Source Voltage (V_{GS}=0V）	V_{DS}	600	V
Gate-Source Voltage (V_{DS}=0V) AC (f>1 Hz)	V_{GS}	±30	V
Continuous Drain Current at Tc=25°C	$I_{D\ (DC)}$	10	A
Continuous Drain Current at Tc=100°C	$I_{D\ (DC)}$	6.4	A
Pulsed drain current **(Note 1)**	$I_{DM\ (pluse)}$	38	A
Maximum Power Dissipation(Tc=25℃) Derate above 25°C	P_D	156 0.55	W W/°C
Single pulse avalanche energy **(Note 2)**	E_{AS}	700	mJ
Avalanche current **(Note 1)**	I_{AR}	9.5	A
Repetitive Avalanche energy ， t_{AR} limited by T_{jmax} **(Note 1)**	E_{AR}	15.6	mJ

Parameter	Symbol	10N60	Unit
Drain Source voltage slope, V_{DS} ≤480 V,	dv/dt	50	V/ns
Reverse diode dv/dt， V_{DS} ≤480 V,I_{SD}<I_D	dv/dt	15	V/ns
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55...+150	℃

* limited by maximum junction temperature

Table 2. Thermal Characteristic

Parameter	Symbol	10N60	Unit
Thermal Resistance，Junction-to-Case（Maximum）	R_{thJC}	0.80	℃ /W
Thermal Resistance，Junction-to-Ambient （Maximum）	R_{thJA}	62.5	℃ /W

Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
On/off states						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=250μA	600			V
Zero Gate Voltage Drain Current(Tc=25℃)	I_{DSS}	V_{DS}=600V,V_{GS}=0V			1	μA
Zero Gate Voltage Drain Current(Tc=125℃)	I_{DSS}	V_{DS}=600V,V_{GS}=0V			100	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V,V_{DS}=0V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	2		4	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=5A		600	730	mΩ
Dynamic Characteristics						
Input Capacitance	C_{lss}	V_{DS}=50V,V_{GS}=0V, F=1.0MHz		590		pF
Output Capacitance	C_{oss}			37		pF
Reverse Transfer Capacitance	C_{rss}			0.9		pF
Total Gate Charge	Q_g	V_{DS}=480V,I_D=10A, V_{GS}=10V		14.6	22	nC
Gate-Source Charge	Q_{gs}			4		nC
Gate-Drain Charge	Q_{gd}			6.7		nC
Switching times						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=380V,I_D=4A, R_G=4.7Ω,V_{GS}=10V		8		nS
Turn-on Rise Time	t_r5			6		nS
Turn-Off Delay Time	$t_{d(off)}$			59	75	nS
Turn-Off Fall Time	t_f			10	15	nS
Source- Drain Diode Characteristics						
Source-drain current(Body Diode)	I_{SD}	T_C=25°C			10	A
Pulsed Source-drain current(Body Diode)	I_{SDM}				32	A
Forward On Voltage	V_{SD}	Tj=25°C,I_{SD}=10A,V_{GS}=0V		0.9	1.2	V
Reverse Recovery Time	t_{rr}	Tj=25°C,I_F=5 A,di/dt=100A/μs		230		nS
Reverse Recovery Charge	Q_{rr}			1.2		uC
Peak Reverse Recovery Current	I_{rrm}			10.5		A

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

2. Tj=25℃,VDD=50V,VG=10V, R_G=25Ω

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (curves) 10N60

Figure1. Safe operating area

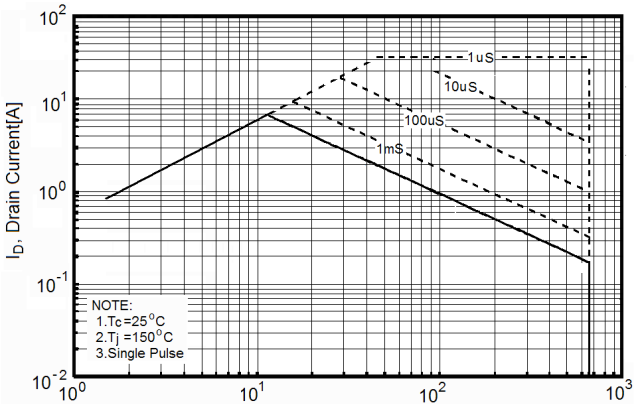


Figure2. Source-Drain Diode Forward Voltage

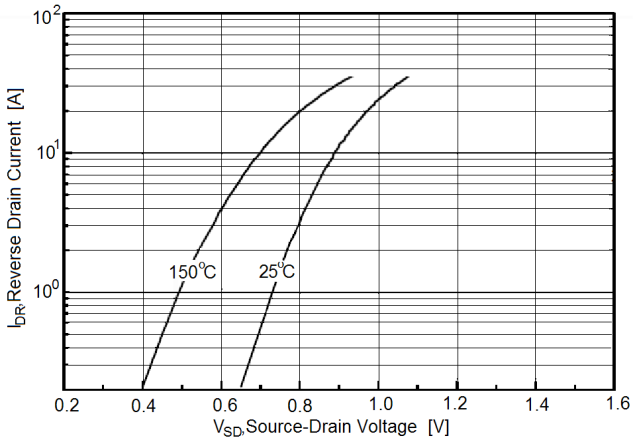


Figure3. Output characteristics

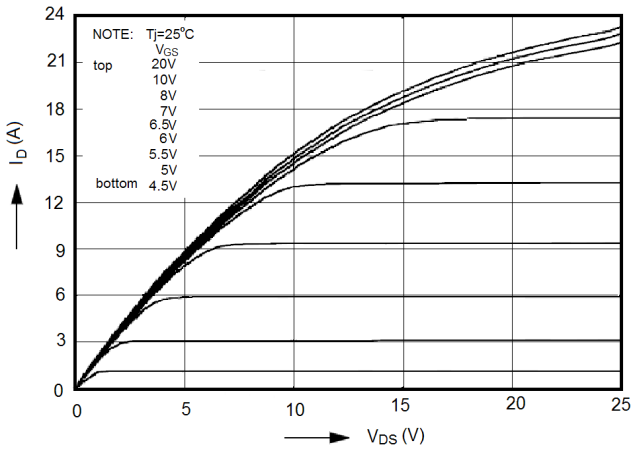


Figure4. Transfer characteristics

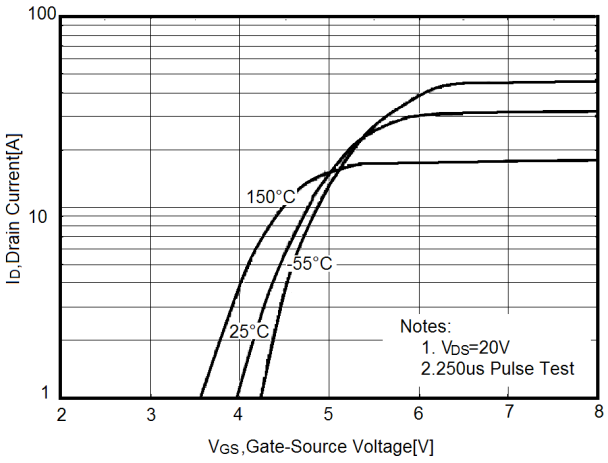
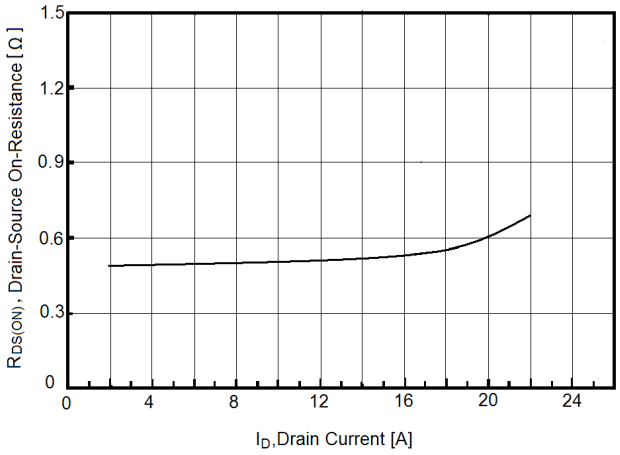


Figure5. Static drain-source on resistance



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (curves) 10N60

Figure7. $R_{DS(ON)}$ vs Junction Temperature

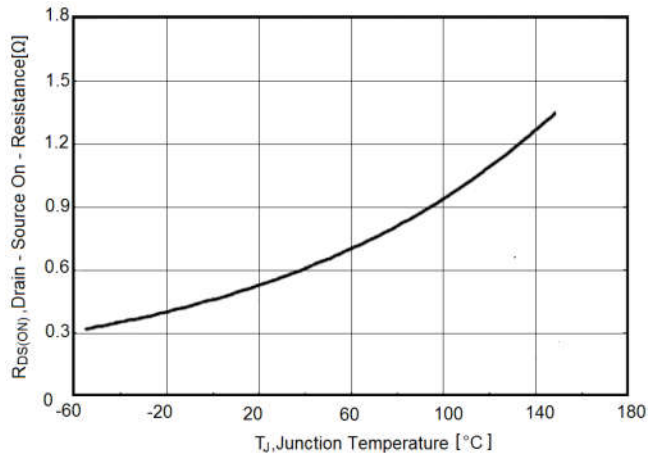


Figure8. BV_{DSS} vs Junction Temperature

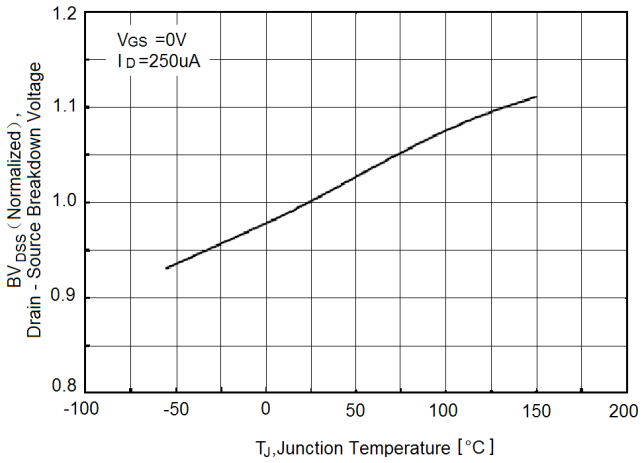


Figure9. Maximum I_D vs Junction Temperature

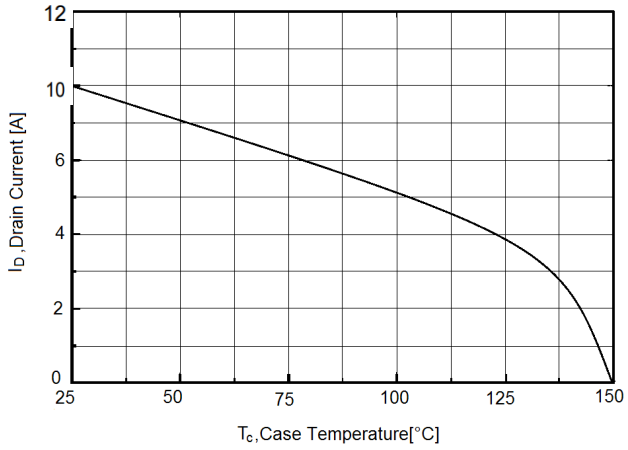


Figure10. Capacitance

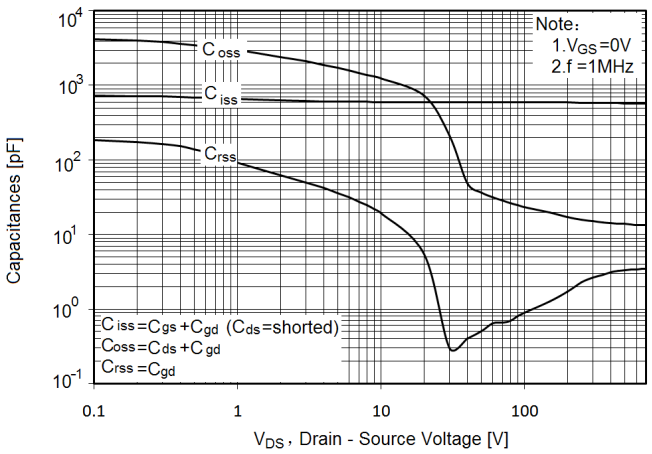


Figure11. Gate charge waveforms

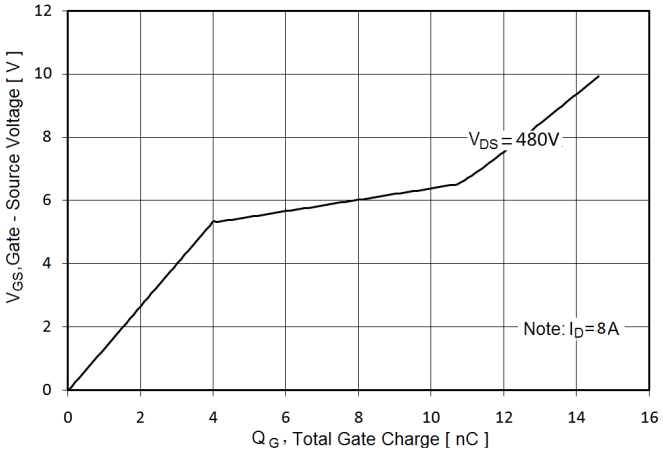
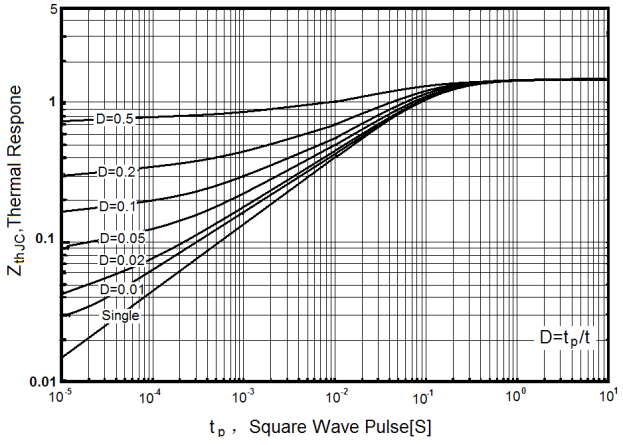


Figure12. Transient Thermal Impedance



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>>ZG(中鑫半导体)