JUXIN semiconductor

JXM60R190F

600V N沟道增强型超结功率场效应管

600V N-CHANNEL Super-Junction POWER MOSFET

20A/600V

Discription

JXM60R190F This N-Channel enhancement mode power MOSFET is produced using advanced Super Juction MOS technologyand have very low conduction and switching losses, making the power converter efficient, high power density, and improved thermal behavior. Furthermore, it's universal applicable, i.e., suitable for hard and soft switching topologies.

Features

- V_{DS}=600V, I_D=20A
- $R_{DS(on)}$（max.）=190 mΩ@V_{GS}=10V
- New revolutionary high voltage technology
- Ultra low gate charge
- High peak current capability

100% UIS TESTED!
100% ΔVds TESTED!

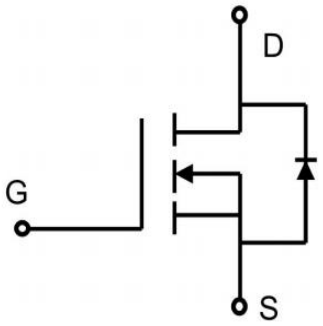
Applications

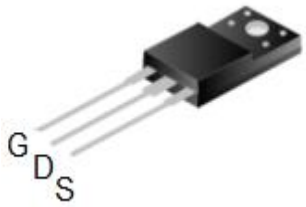
- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- Power Factor Correction (PFC)
- LED lighting power

Note

- Products made by JUXIN semiconductor

Schematic diagram





ITO-220AB

ORDERING INFORMATION

Part No.	Package	Marking	Material	Packing
JXM60R190F	ITO-220AB	JXM60R190F	Pb free	Tube

ABSOLUTE MAXIMUM RATINGS（T_J=25℃ unless otherwise noted）

Characteristics		Symbol	Ratings	Unit
Drain-Source Voltagee(V_{GS}=0V）		V_{DS}	600	V
Gate-Source Voltagee		V_{GS}	±20	V
Gate-Source Voltagee(V_{DS}=0V), AC(f>1HZ)		V_{GS}	±30	V
Continuous Drain Current	T_C=25℃	I_D	20	A
	T_C=100°C		12	
Drain Current Pulsed(Note 1)		I_{DM}	80	A
Power Dissipation（T_C=25℃）		PD	25	W
-Derate above 25°C			0.20	W/℃
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	470	mJ
Reverse Diode dv/dt, V_{DS}≤400V(Note 3)		dv/dt	15	V/ns
Drain Source Voltage Slope, V_{DS}≤480V(Note 3)		dVds/dt	50	V/ns
Operation Junction Temperature Range		T_J	-55 to+150	℃
Storage Temperature Range		T_{STG}	-55 to+150	℃
Continuous Diode Forward Current		I_S	20	A
Diode Pulse Current		$I_{S.PULSE}$	80	A
Maximum diode commutation speed, V_{DS}≤400V(Note 3)		dir/dt	500	A/μs

Note：

1. Repetitive Rating: Pulse Width tp Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25℃, V_{DD}=100V, V_G=10V, R_G=25ohm, L=79mH.
3. I_{SD}≤I_D, Starting T_J =25℃.

THERMAL CHARACTERISTICS

Characteristics	Symbol	MAX	Unit
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	5.0	°C/W
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	°C/W
Soldering Temperature, Wave Soldering only Allowed at Leads. (1.6mm from Case for 10s)	T_{sold}	260	°C

ELECTRICAL CHARACTERISTICS

Off Characteristics

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Drain -Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	600	--	--	V
Drain-Source Leakage Current	I_{DSS}	V_{DS}=650V， V_{GS}=0V,T_J = 25℃	--	--	1.0	uA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=+20V,V_{DS}=0V	--	--	100	nA
Gate-Source Leakage Current	I_{GSS}	V_{GS}=-20V,V_{DS}=0V	--	--	-100	nA

On Characteristics

Gate Threshold Voltage	$V_{GS(th)}$	V_{GS}=V_{DS}, I_D=250uA	2.0	--	4.0	V
Static Drain- Source On State Resistance	$R_{DS(on)}$	V_{GS}=10V, I_D=10A	--	165	190	mΩ

Dynamic Characteristics

Gate Resistance	R_g	V_{GS}=0V, f=1.0MHZ	1	2.7	10	Ω
Input Capacitance	C_{iss}	V_{DS}=100V, V_{GS}=0V, f=1MHz	--	1177	--	pF
Output Capacitance	C_{0ss}		--	53	--	
Reverse Transfer Capacitance	C_{rss}		--	1.1	--	

Switching Characteristics

Turn-on Delay Time	$t_{d(on)}$	V_{DD}=300V, V_{GS}=10V, R_G=24Ω I_D=20A (Note 4,5)	--	22	--	ns
Turn-on Rise Time	t_r		--	51	--	
Turn-off Delay Time	$t_{d(off)}$		--	79	--	
Turn-off Fall Time	t_f		--	38	--	
Total Gate Charge	Q_g	VDD=480V, VGS=0 to 10V, ID=20A (Note 4,5)	--	31	--	nC
Gate-Source Charge	Q_{gs}		--	9.7	--	
Gate-Drain Charge	Q_{gd}		--	14	--	
Gate Plateau Voltage	$V_{plateau}$		--	7.1	--	V

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS

Characteristics	Symbol	Test conditions	Min.	Typ.	Max.	Unit
Diode Forward Voltage	V_{SD}	I_S=20A, V_{GS}=0V	--	--	1.4	V
Reverse Recovery Time	Trr	I_S=20A,V_{GS}=0V,V_R=50V, dIF/dt=100A/μS	--	290	--	ns
Reverse Recovery Charge	Qrr		--	4.2	--	μC
Peak Reverse Recovery Current	Irrm		--	29	--	A

Note：

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
2. E_{AS} condition: Starting T_J=25℃, V_{DD}=100V, V_G=10V, R_G=25ohm, L=79mH.
3. I_{SD}≤I_D, Starting T_J =25℃.
4. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%.
5. Essentially Independent of Operating Temperature Typical Characteristics.

典型特性曲线

Fig.1: Output Characteristics

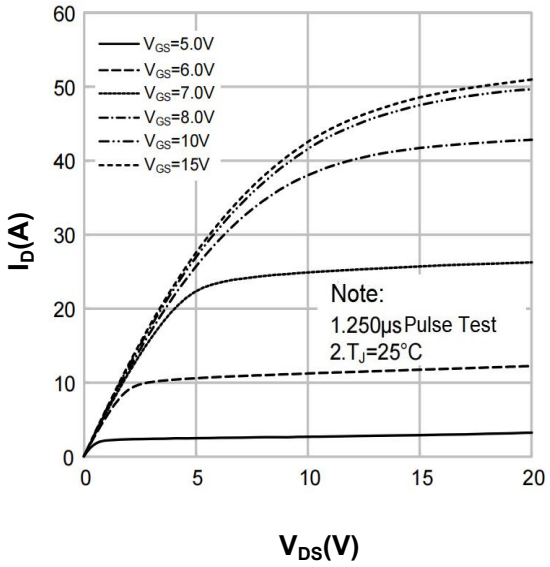


Fig.2: Typical Transfer Characteristics

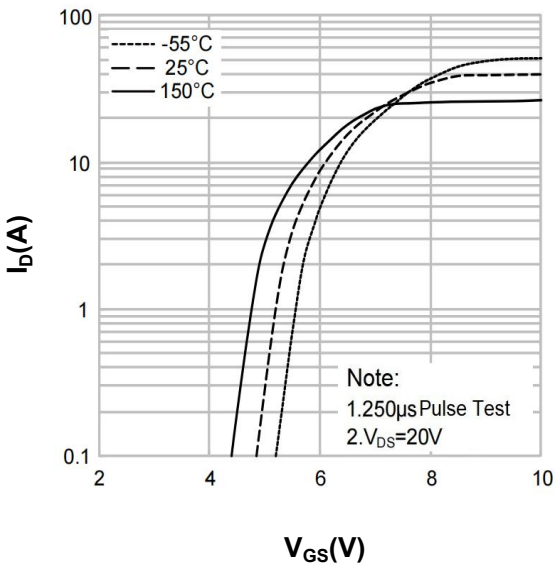


Fig.3: Typical On-resistance vs. Drain Current

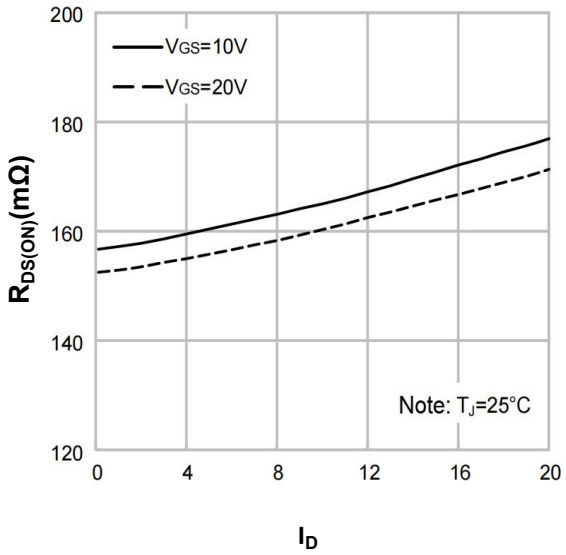


Fig.4: Typical Body Diode Forward Voltage

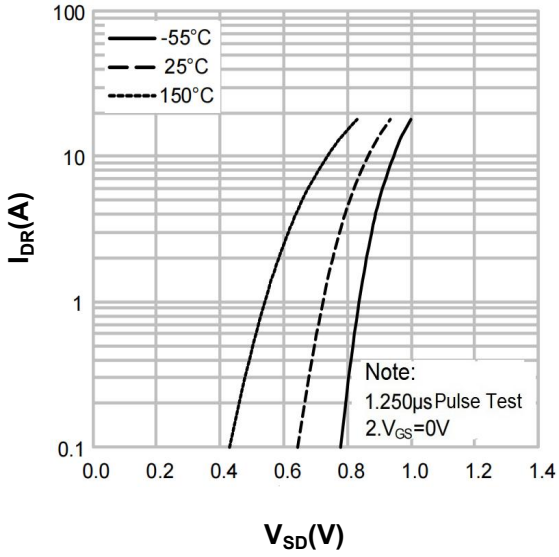


Fig.5: Typical Capacitance Characteristics

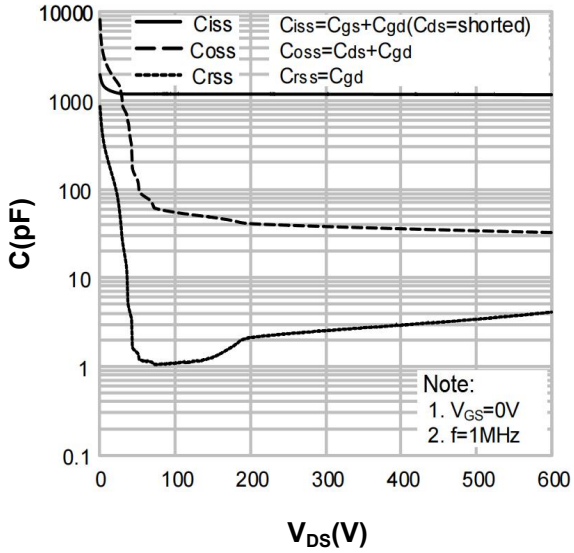
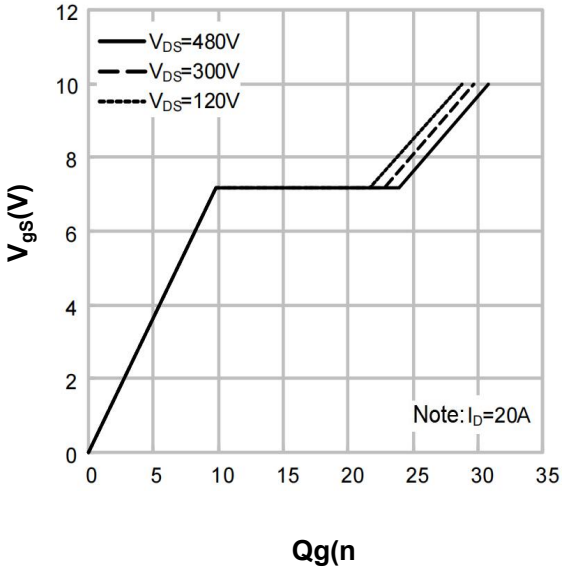


Fig.6: Typical Gate Charge Characteristics



The curve above is for reference only.

典型特性曲线

Fig.7: Nomalized Breakdown Volatge vs. Juction Temperature

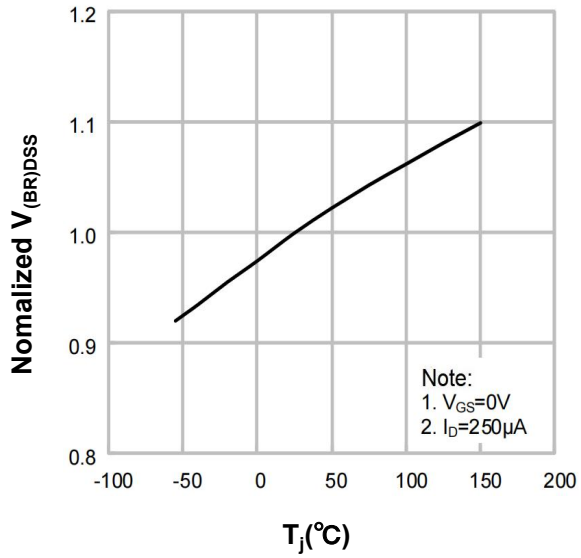


Fig.8: Nomalized on Resistance vs. Juction Temperature

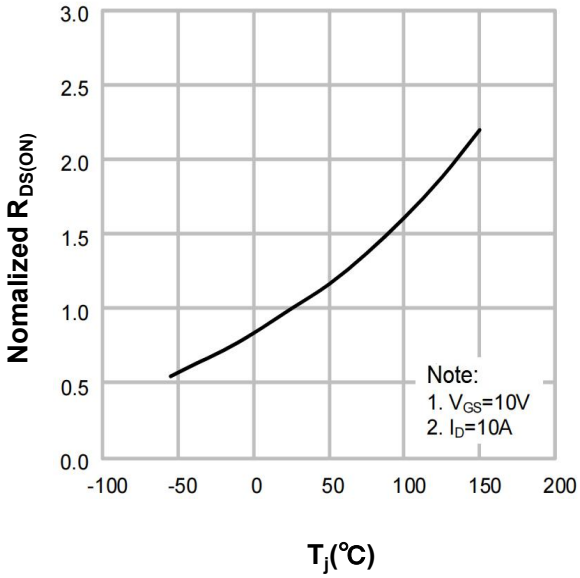


Fig.9: Maximum Safe Operating Area

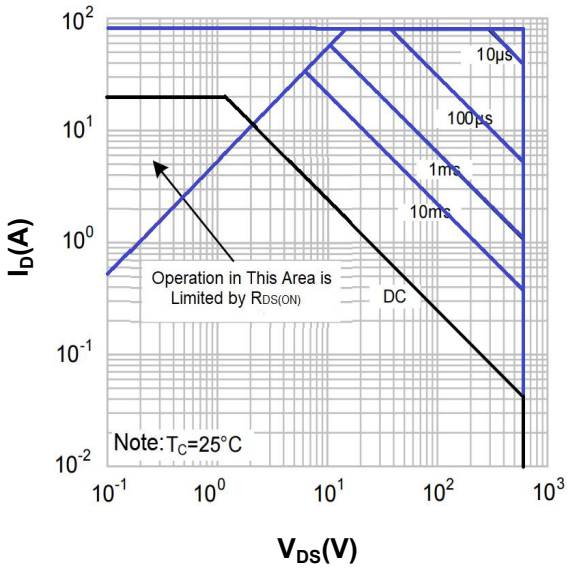


Fig.10: Power dissipation

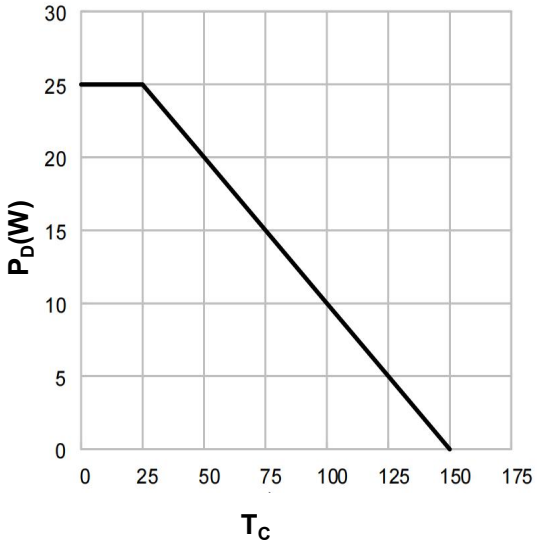
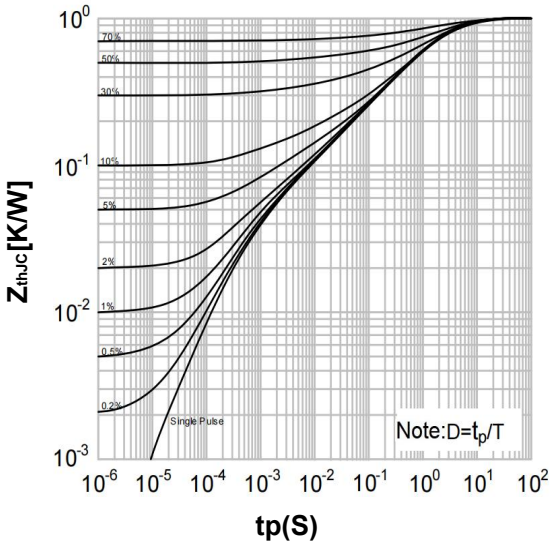


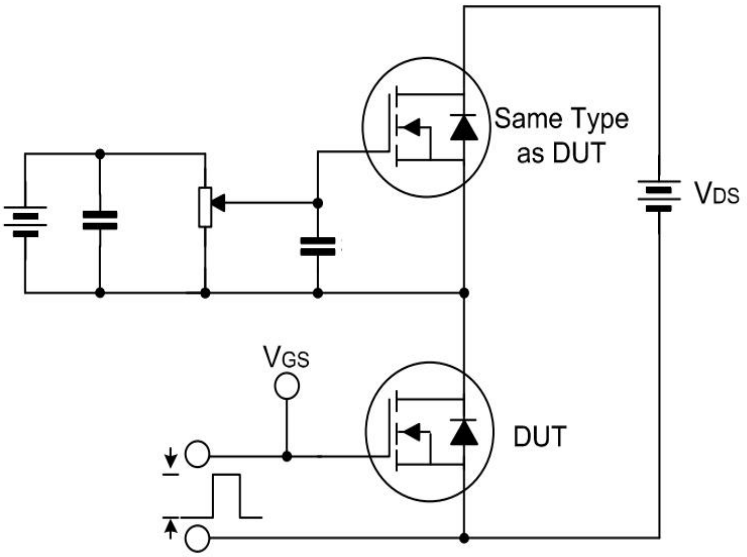
Fig.11: Max. Transient Thermal Impedance

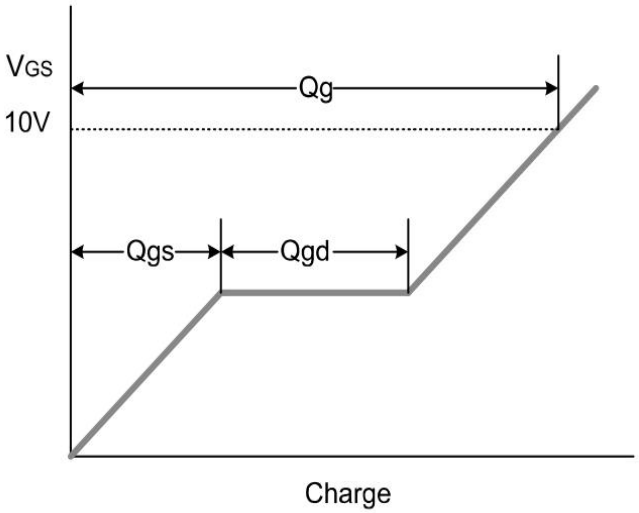


The curve above is for reference only.

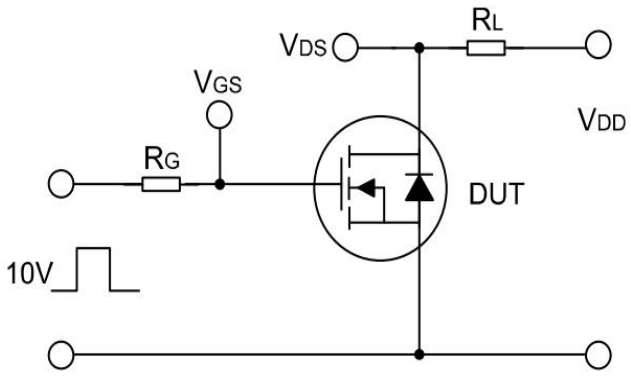
Test Circuit

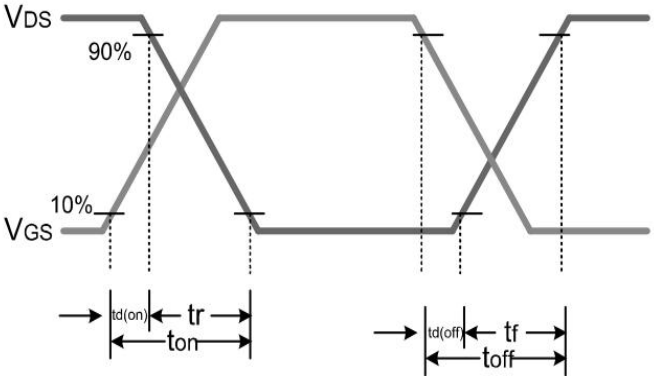
Gate Charge Test Circuit & Waveform



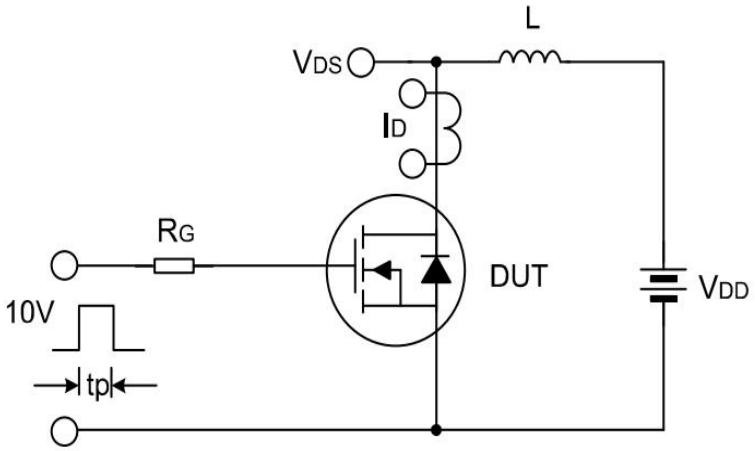


Resistive Switching Test Circuit & Waveform

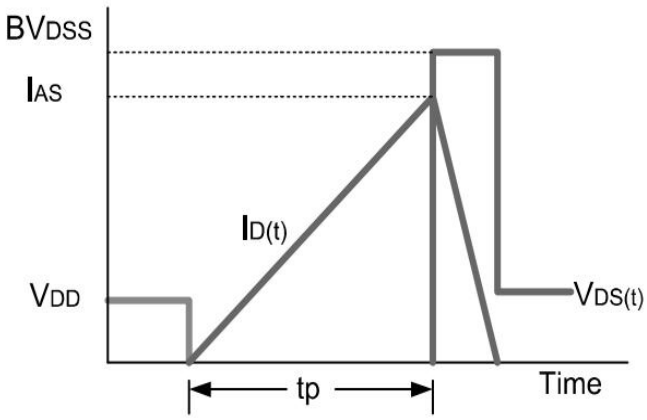




Unclamped Inductive Switching Test Circuit & Waveform



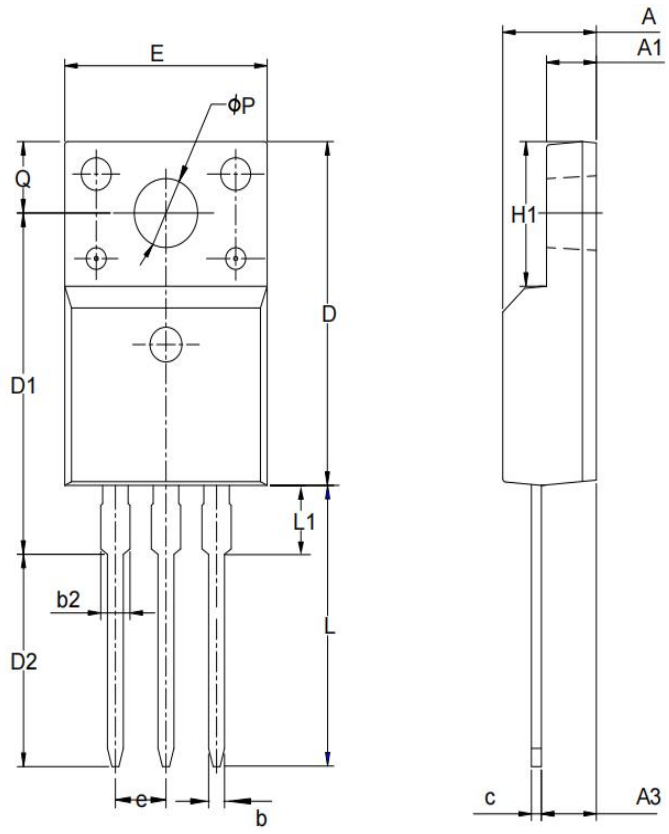
$$E_{AS} = \frac{1}{2} LI_{AS}^2 \frac{BV_{DSS}}{BV_{DSS} - V_{DD}}$$



Package Dimensions of ITO-220AB

Package Dimensions of ITO-220AB

Unit:mm



SYMBOL	MILIMETER	
	MIN	MAX
A	4.20	4.95
A1	2.24	3.10
A3	2.30	3.30
b	0.60	1.00
b2	1.15	1.55
c	0.35	0.65
D	14.80	16.40
D1	15.00	17.00
D2	8.80	11.60
E	9.70	10.60
e	2.54BSC	
H1	6.00	7.40
L	11.40	15.10
L1	2.60	4.50
Φ P	2.90	3.40
Q	3.00	3.70

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