

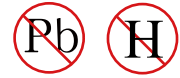


YEA SHIN TECHNOLOGY CO., LTD

YS10N65

N-Channel Enhancement MOSFET

V_{DS}= 650V, I_D= 10A



Feature

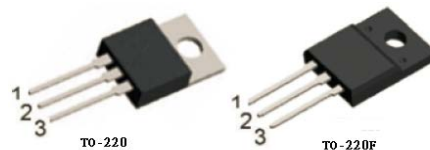
- R_{DS(ON)}<1Ω @ V_{GS}=10V
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

Mechanical Data

- Case : TO-220, TO-220F, TO-262, TO-263

PRODUCT SUMMARY

V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
650	1 @ V _{GS} =10V	10



Pin Definition:

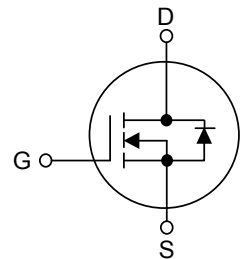
1. Gate
2. Drain
3. Source

Ordering Information

Part No.	Package	Packing
YS10N65P-TU	TO-220	50pcs / Tube
YS10N65F-TU	TO-220F	50pcs / Tube
YS10N65J-TU	TO-262	50pcs / Tube
YS10N65H-TU	TO-263	50pcs / Tube
YS10N65H-TR	TO-263	800pcs / 13" Reel



Block Diagram



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V _{DSS}	650	V
Gate-Source Voltage		V _{GSS}	±30	V
Continuous Drain Current		I _D	10	A
Pulsed Drain Current (Note 2)		I _{DM}	38	A
Avalanche Energy	Single Pulsed (Note 3)	E _{AS}	608	mJ
Power Dissipation	TO-220 / TO-262 / TO-263	P _D	156	W
	TO-220F		50	
Junction Temperature		T _J	+150	°C
Operating Temperature		T _{OPR}	-55 ~ +150	°C
Storage Temperature		T _{STG}	-55 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. Repetitive Rating : Pulse width limited by T_J

3. L = 30mH, I_{AS} = 6.2A, V_{DD} = 50V, R_G = 25 Ω, Starting T_J = 25°C

DEVICE CHARACTERISTICS

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THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ TO-220F TO-262/TO-263	θ_{JA}	62.5	°C/W
Junction to Case	TO-220	θ_{JC}	0.85	°C/W
	TO-220F		2.6	

ELECTRICAL CHARACTERISTICS (T_C=25°C, unless otherwise specified)

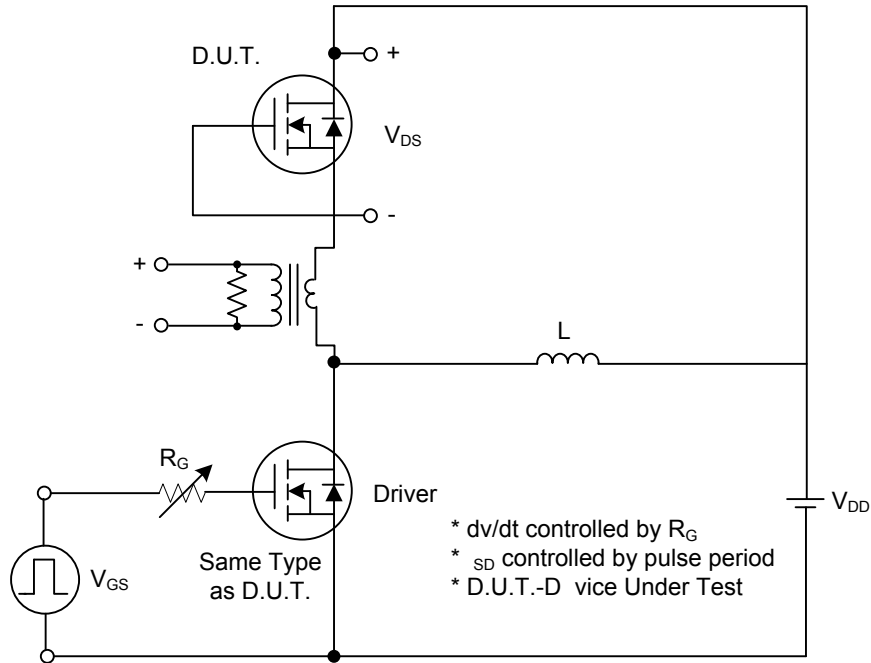
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	650			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =650V, V _{GS} =0V			1	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _G =30V, V _{DS} =0V			100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	X _{DS} =10V, I _D =5A		0.88	1.0	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0 MHz		1200		pF
Output Capacitance		C _{OSS}			166		pF
Reverse Transfer Capacitance		C _{RSS}			8		pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		t _{D(ON)}	V _{DD} =325V, I _D =10A, R _G =25Ω (Note 1, 2)		40		ns
Turn-On Rise Time		t _R			74		ns
Turn-Off Delay Time		t _{D(OFF)}			52		ns
Turn-Off Fall Time		t _F			35		ns
Total Gate Charge		Q _G	V _{DS} =520V, I _D =10A, V _{GS} =10V (Note 1, 2)		24		nC
Gate-Source Charge		Q _{GS}			8		nC
Gate-Drain Charge		Q _{GD}			7		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0 V, I _S =10A			1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I _S				10	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				40	A
Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =10A,		570		ns
Reverse Recovery Charge		Q _{RR}	dI _F /dt =100 A/μs (Note 1)		4.7		μC

Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.
2. Essentially independent of operating temperature.

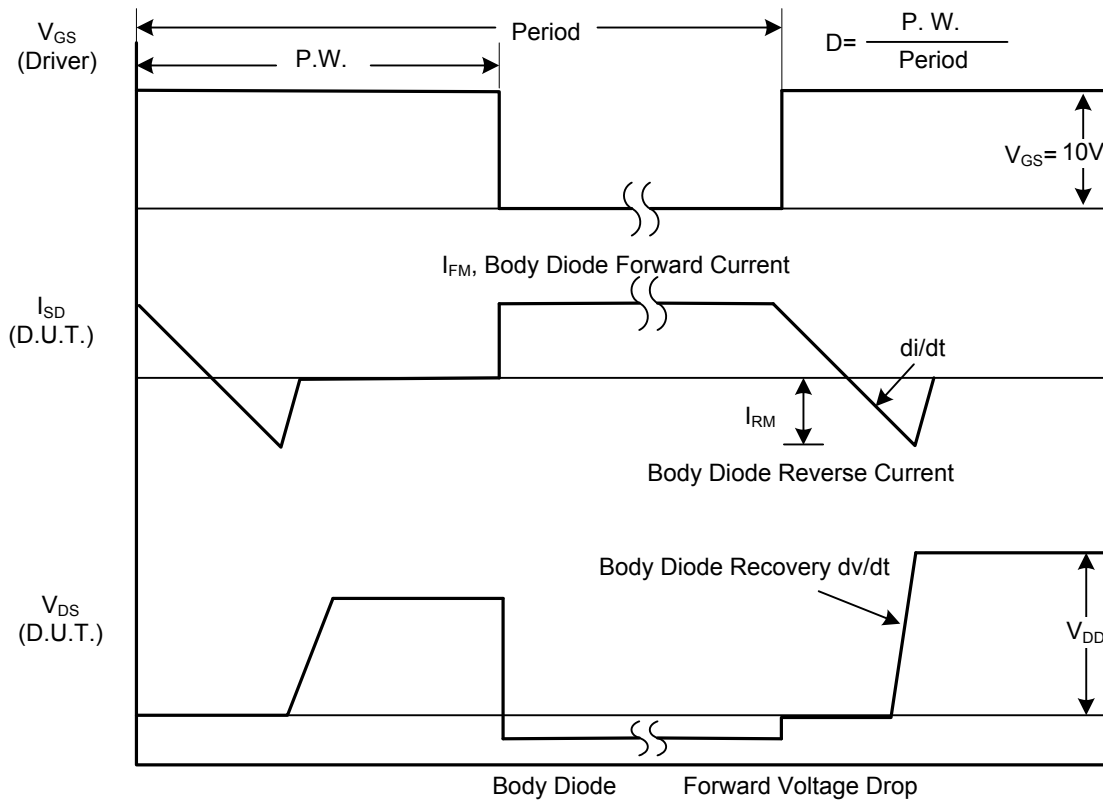
DEVICE CHARACTERISTICS

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TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit

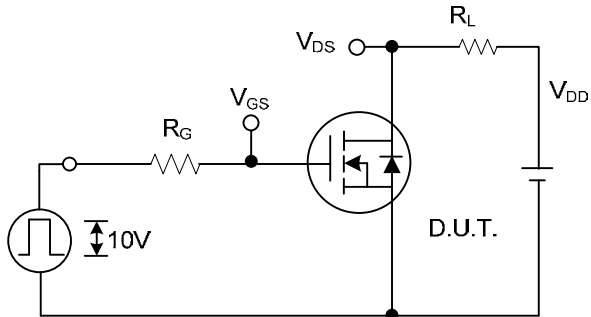


Peak Diode Recovery dv/dt Waveforms

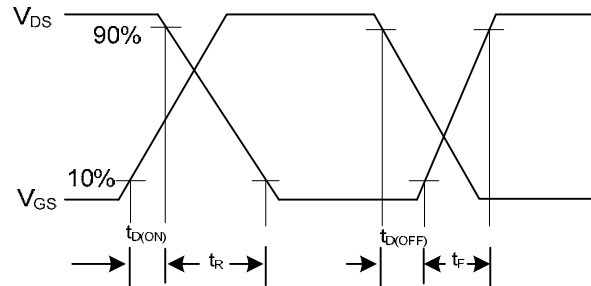
DEVICE CHARACTERISTICS

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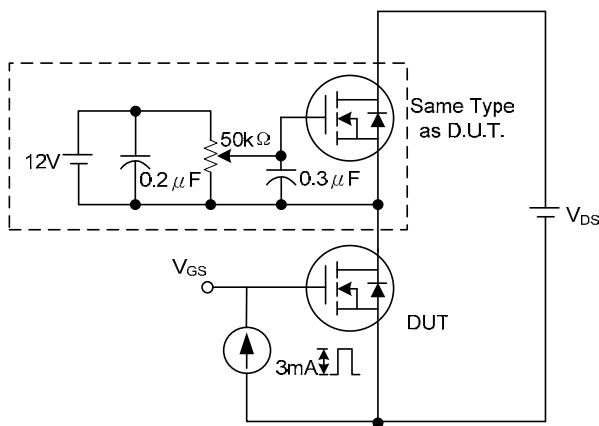
TEST CIRCUITS AND WAVEFORMS(Cont.)



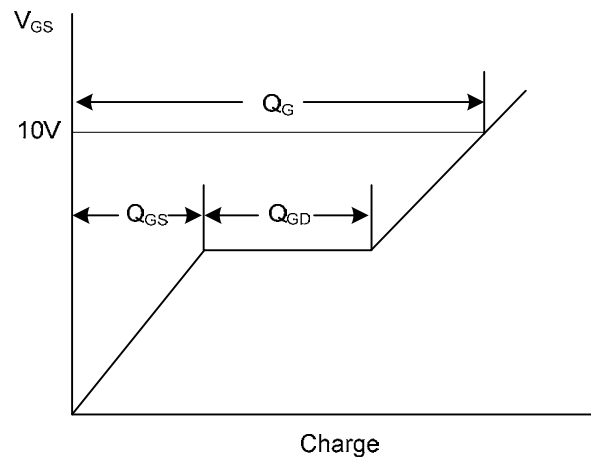
Switching Test Circuit



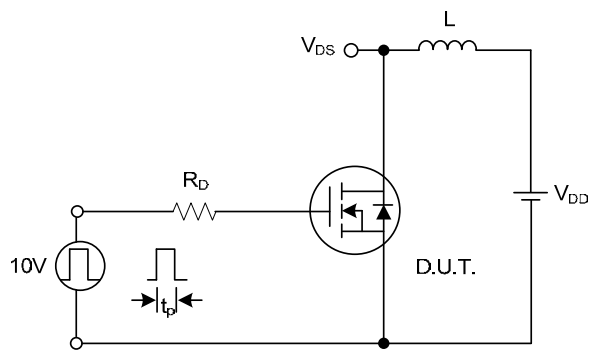
Switching Waveforms



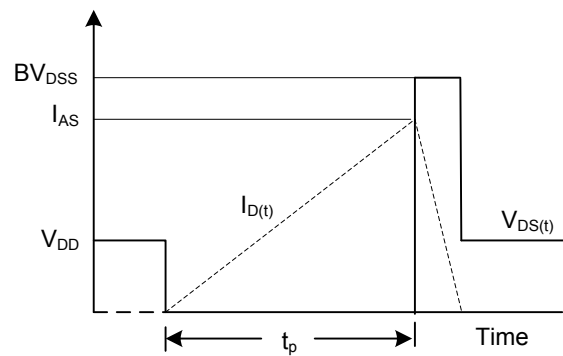
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

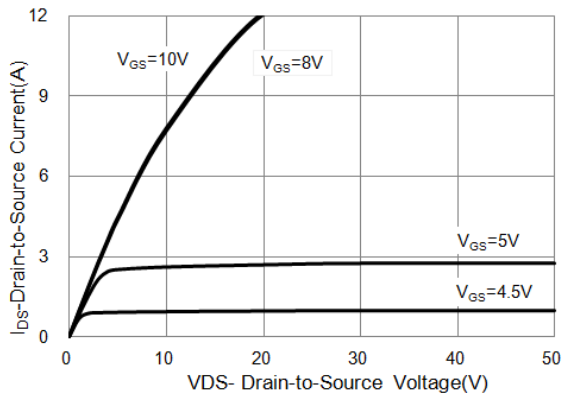


Unclamped Inductive Switching Waveforms

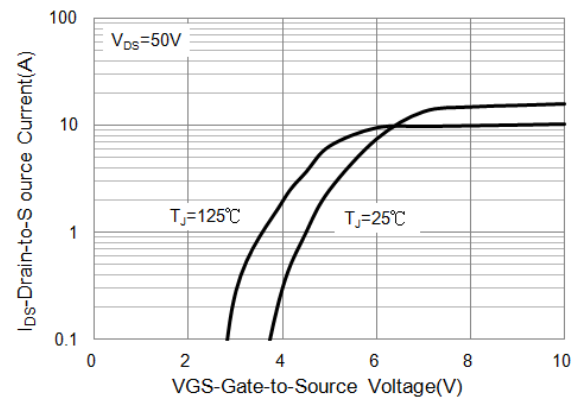
DEVICE CHARACTERISTICS

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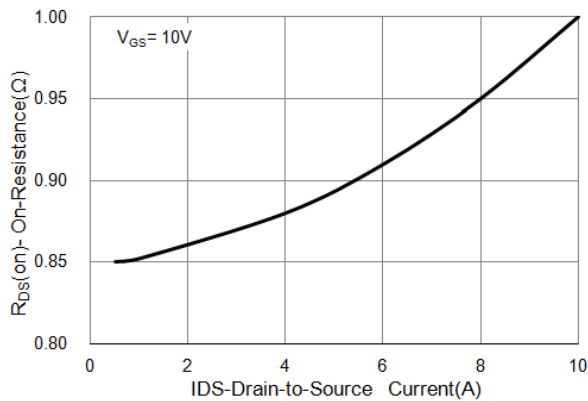
TYPICAL CHARACTERISTICS



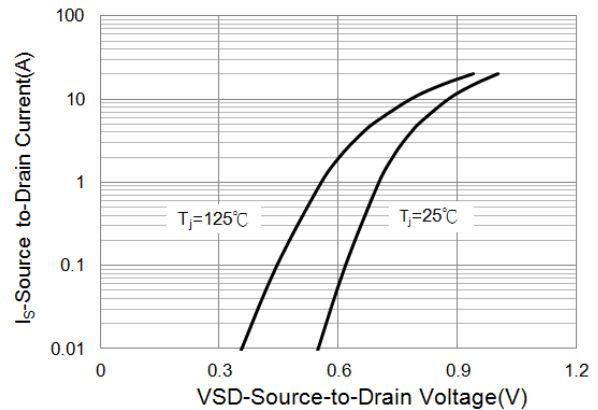
Output Characteristics



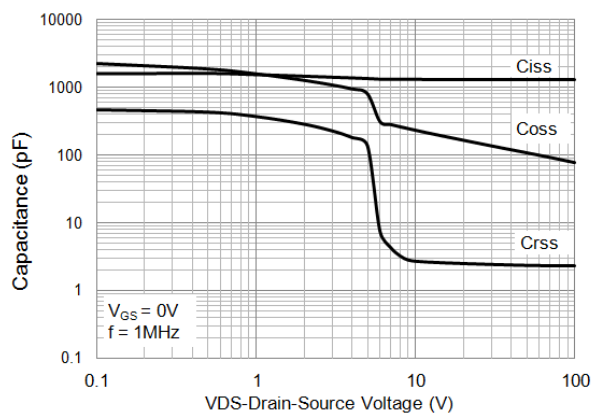
Transfer Characteristics



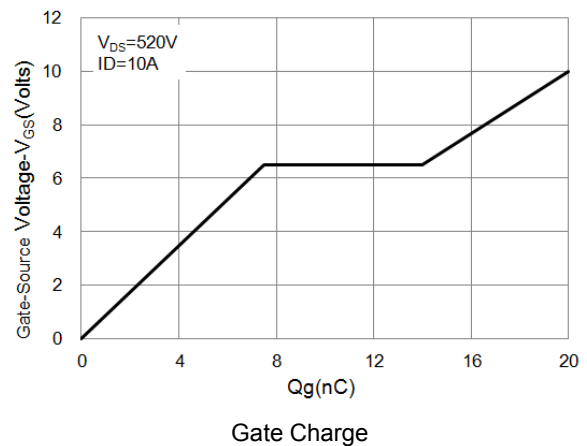
On-Resistance vs. Drain Current



Source-Drain Diode Forward Voltage



Capacitance vs. Drain-Source Voltage

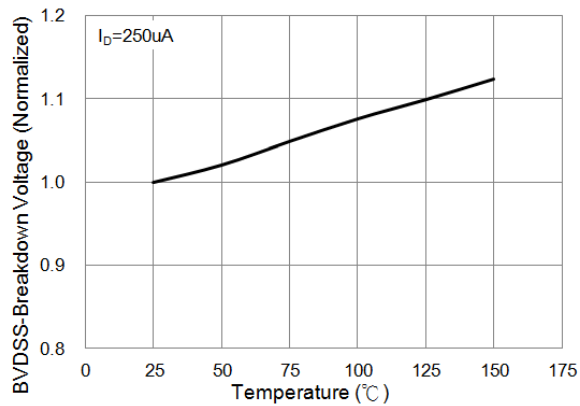


Gate Charge

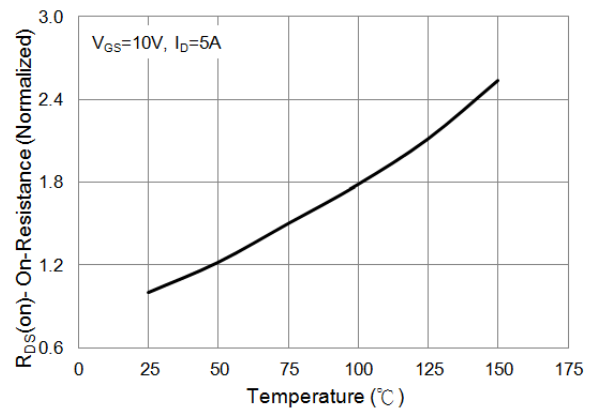
DEVICE CHARACTERISTICS

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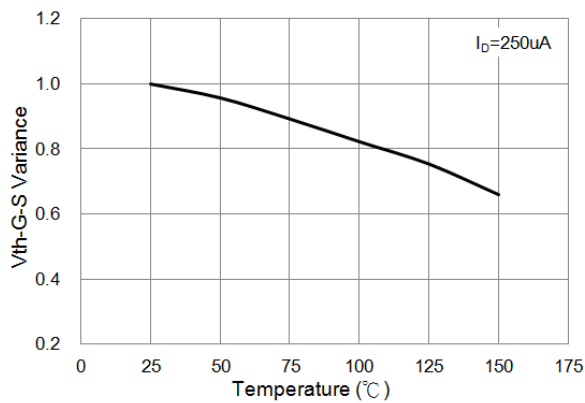
TYPICAL CHARACTERISTICS



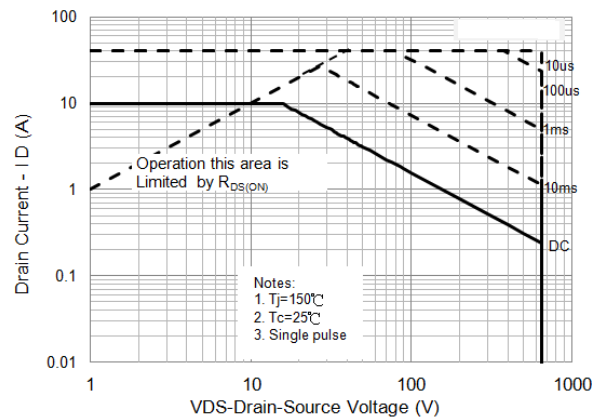
BV_{DSS} vs. Junction Temperature



On-Resistance vs. Junction Temperature



Threshold Voltage Variation with Temperature

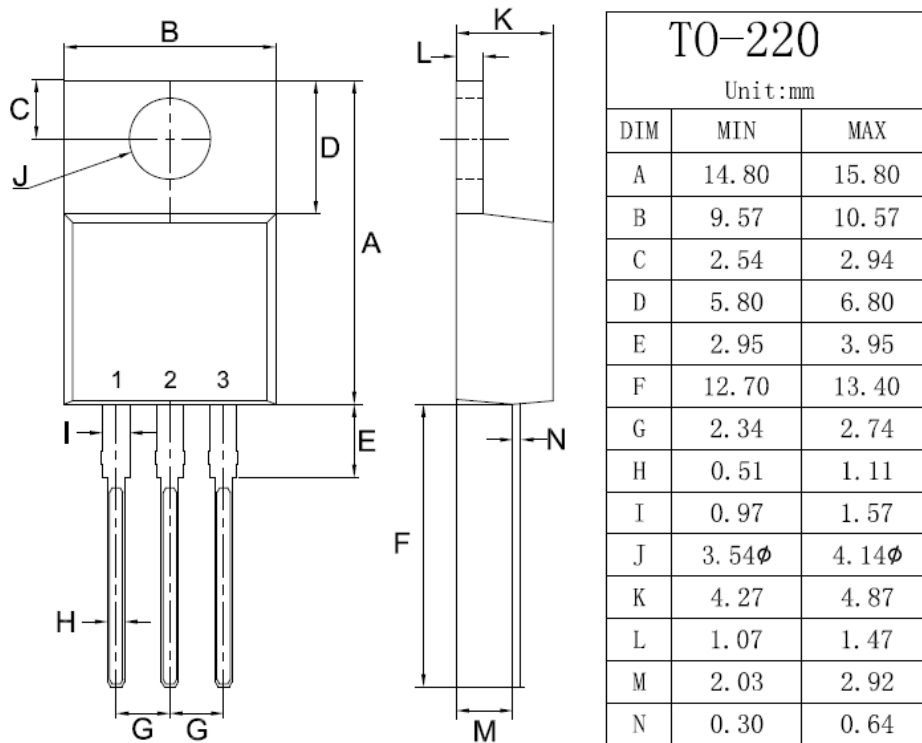


Maximum Safe Operating Area

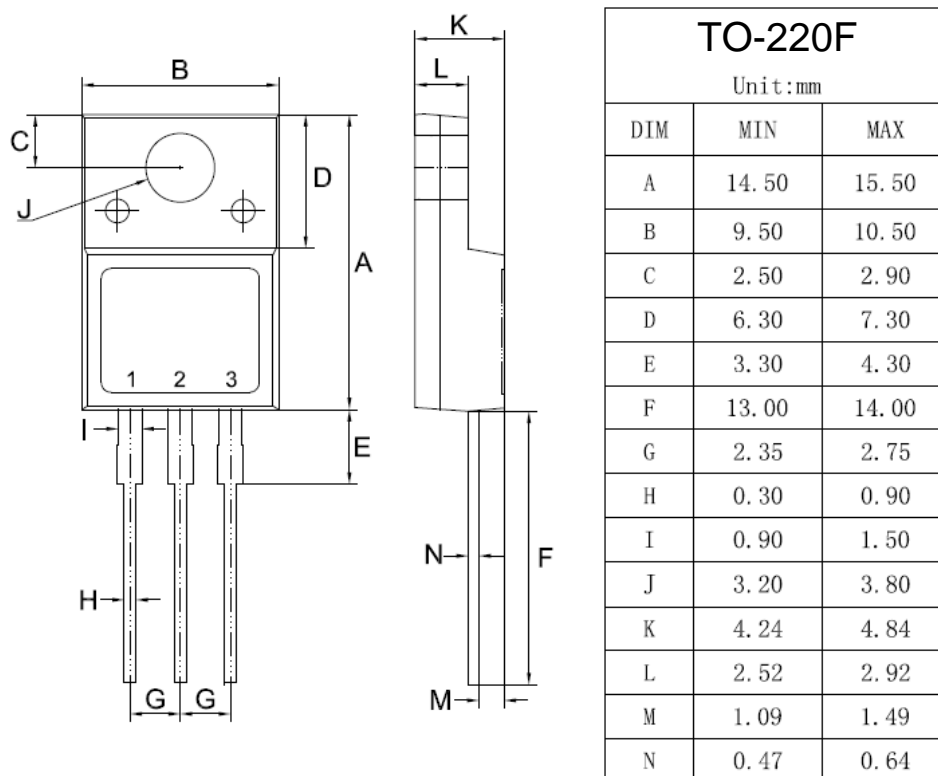
PACKAGE OUTLINE & DIMENSIONS

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TO-220 Mechanical Drawing



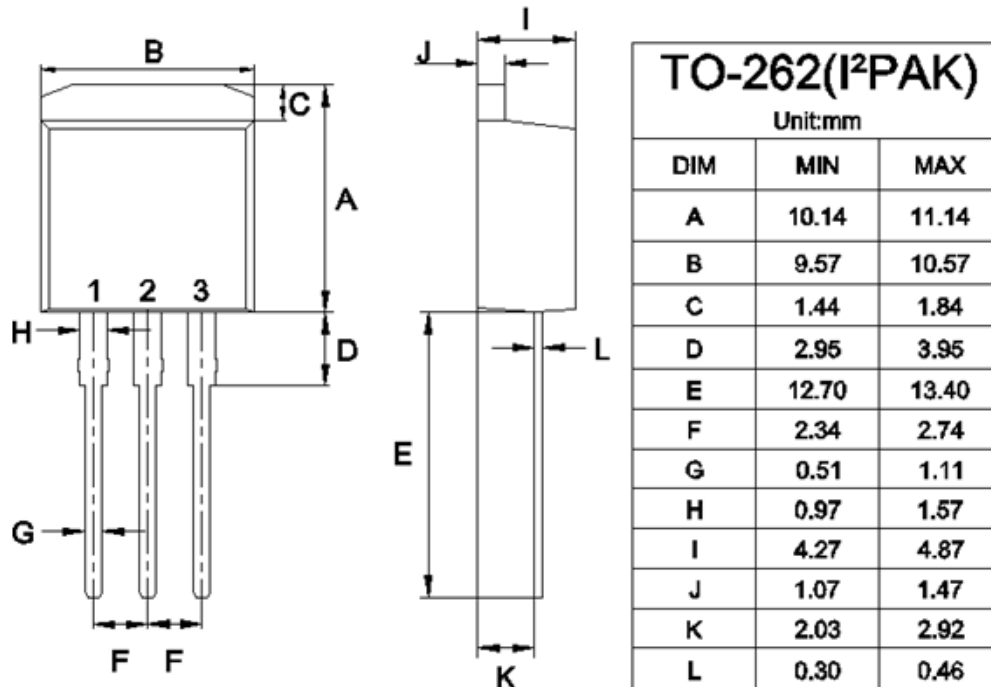
TO-220F Mechanical Drawing



PACKAGE OUTLINE & DIMENSIONS

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TO-262 Mechanical Drawing



TO-263 Mechanical Drawing

