

Features

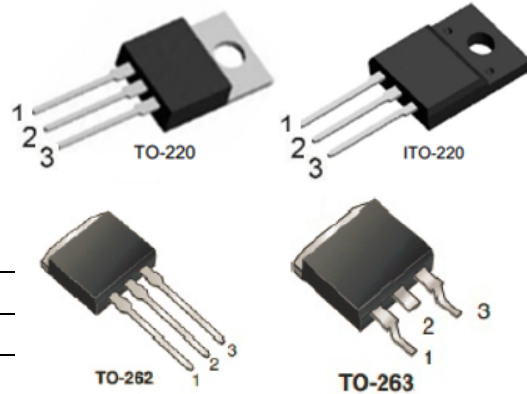
- $R_{DS(ON)} < 1\Omega$ @ $V_{GS} = 10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

Mechanical Data

- Case: TO-220, ITO-220 Package

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
650	1 @ $V_{GS} = 10V$	10



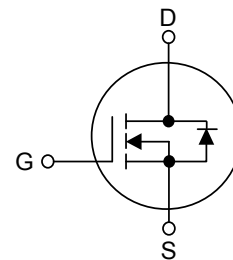
Pin Definition:

1. Gate
2. Drain
3. Source

Ordering Information

Part No.	Package	Packing
DMT10N65-TU	TO-220	50pcs / Tube
DMF10N65-TU	ITO-220	50pcs / Tube
DMK10N65-TU	TO-262	50pcs / Tube
DMG10N65-TU	TO-263	50pcs / Tube
DMG10N65-TU	TO-263	800pcs / 13" Reel

Block Diagram



ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ C$, 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
Power Dissipation	TO-220/TO-262/TO-263	P_D	156
	ITO-220		50
Junction Temperature	T_J	+150	$^\circ C$
Operating Temperature	T_{OPR}	-55 ~ +150	$^\circ C$
Storage Temperature	T_{STG}	-55 ~ +150	$^\circ C$

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. $L = 30mH$, $I_{AS} = 6.2A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$

THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ITO-220 TO-262/TO-263	θ_{JA}	62.5	$^{\circ}\text{C/W}$
Junction to Case	TO-220	θ_{JC}	0.85	$^{\circ}\text{C/W}$
	ITO-220		2.6	

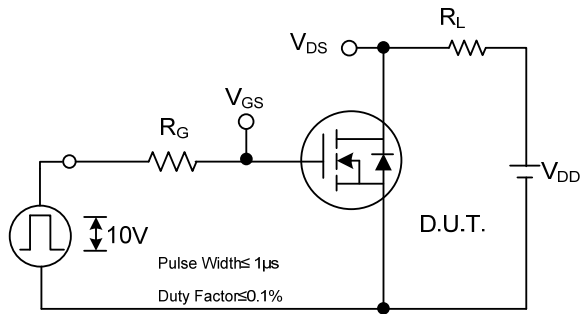
ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

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 _D =0V			100	nA
	Reverse		V _G =-30V, V _D =0V			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _D =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =5A		0.88	1.0	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _D =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 _D =520V, I _D =10A, V _G =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

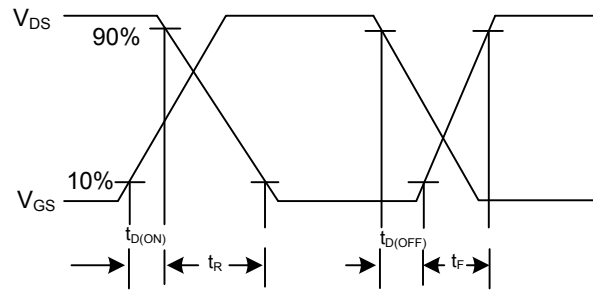
Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

2. Essentially independent of operating temperature.

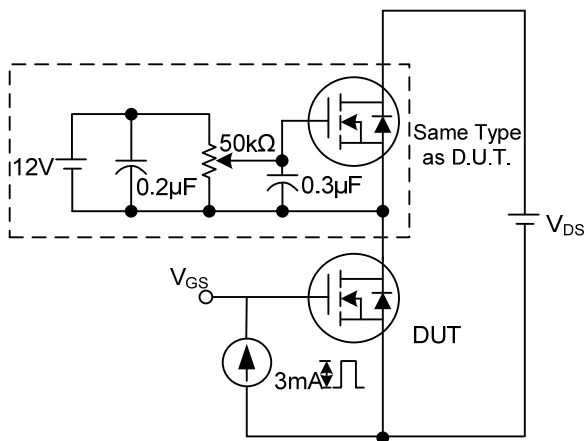
TEST CIRCUITS AND WAVEFORMS(Cont.)



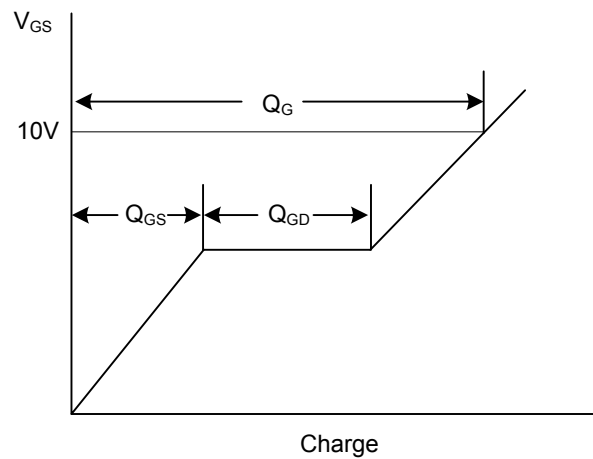
Switching Test Circuit



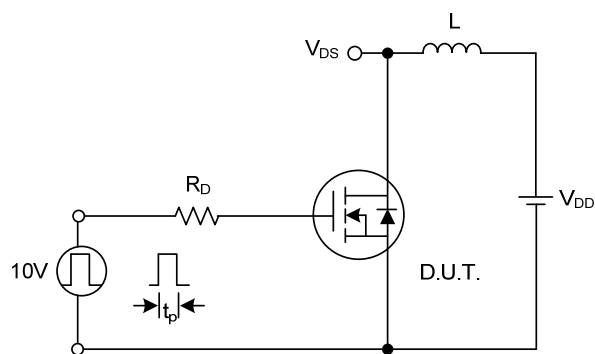
Switching Waveforms



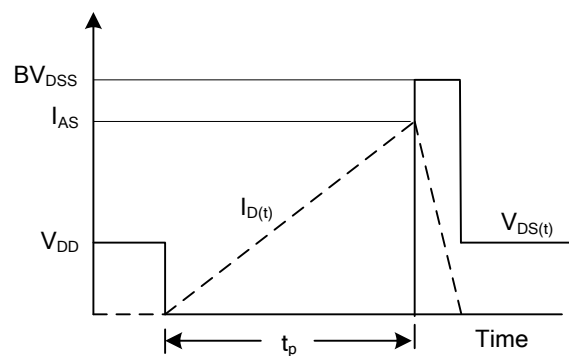
Gate Charge Test Circuit



Gate Charge Waveform

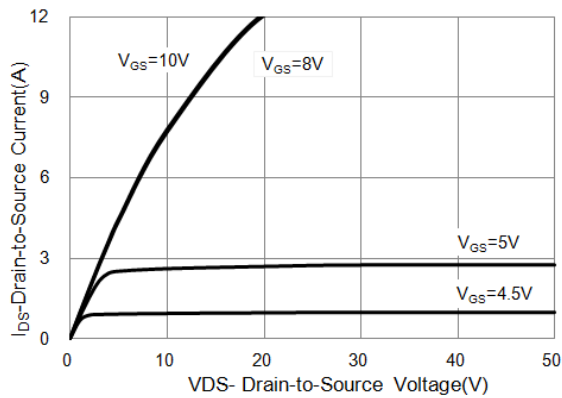


Unclamped Inductive Switching Test Circuit

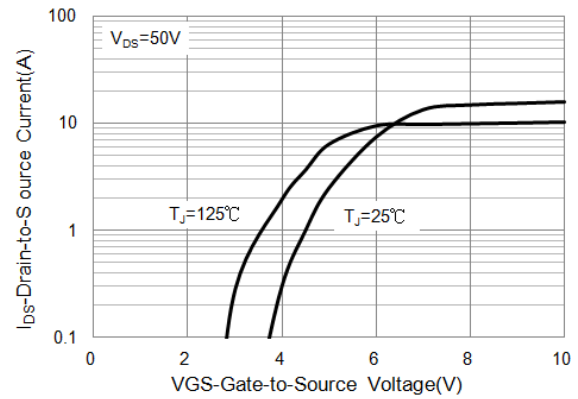


Unclamped Inductive Switching Waveforms

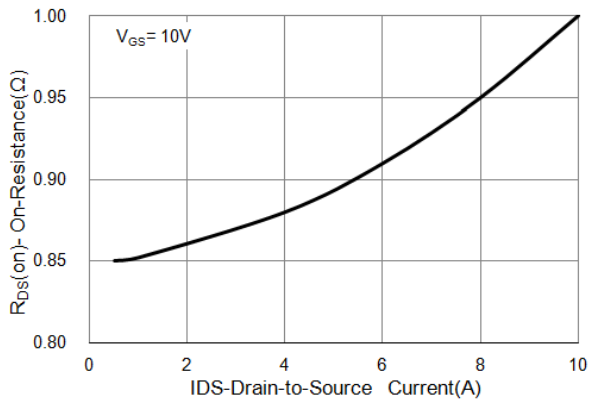
TYPICAL CHARACTERISTICS



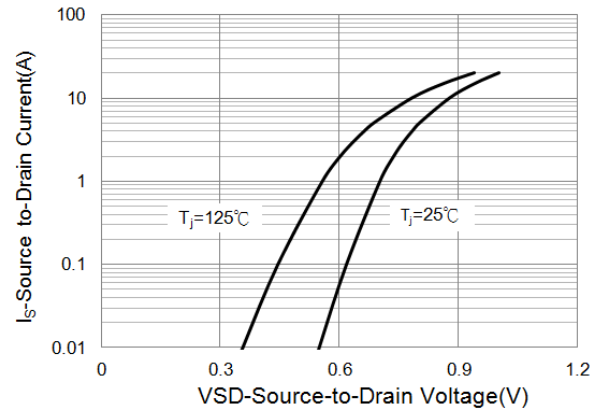
Output Characteristics



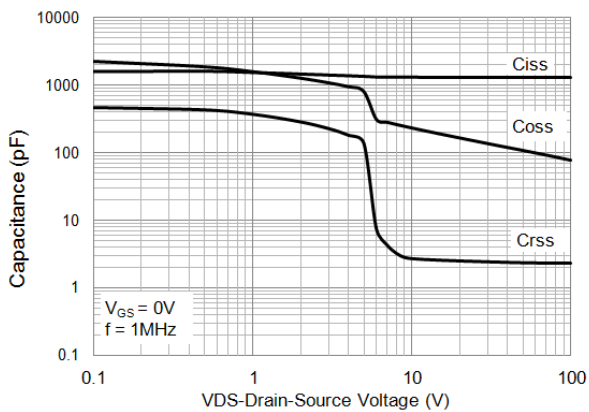
Transfer Characteristics



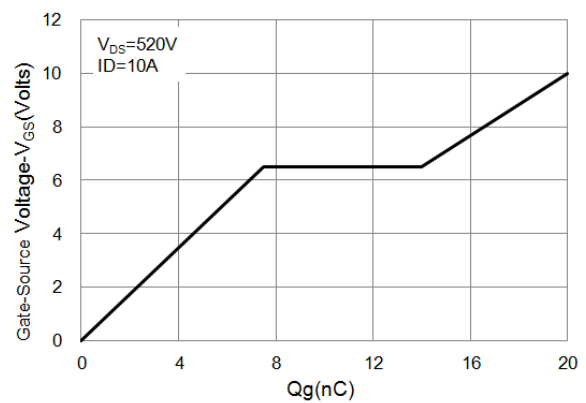
On-Resistance vs. Drain Current



Source-Drain Diode Forward Voltage

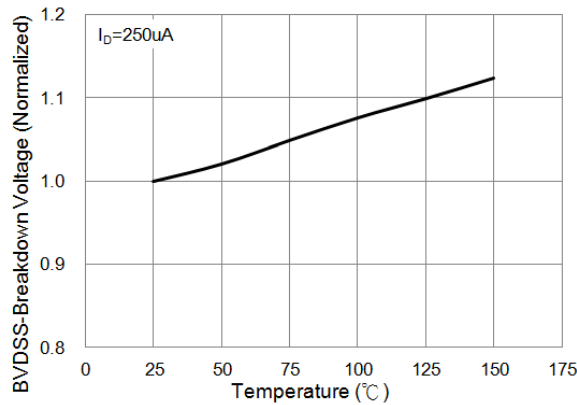


Capacitance vs. Drain-Source Voltage

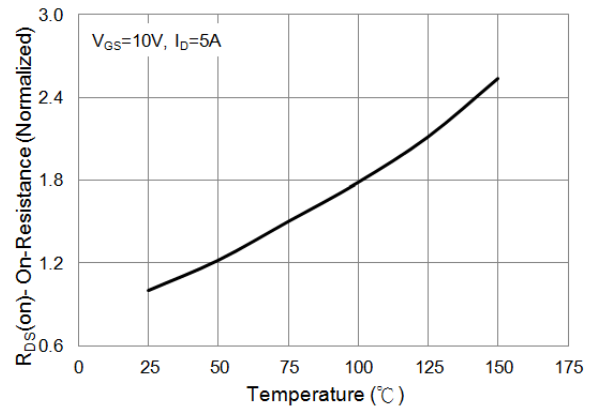


Gate Charge

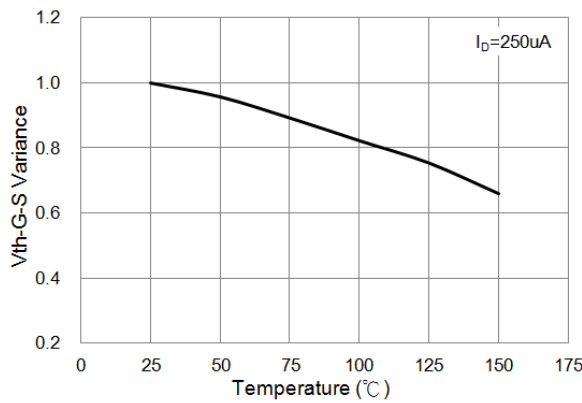
TYPICAL CHARACTERISTICS



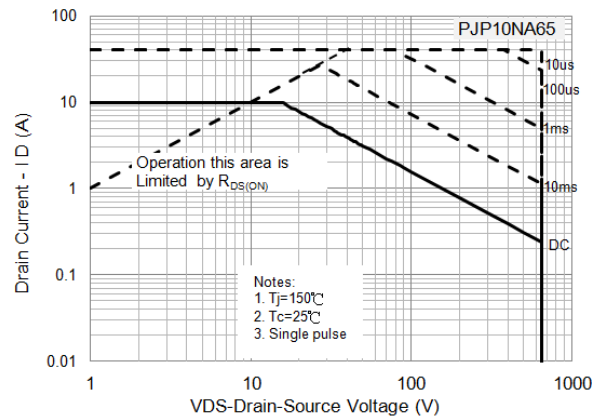
BV_{DSS} vs. Junction Temperature



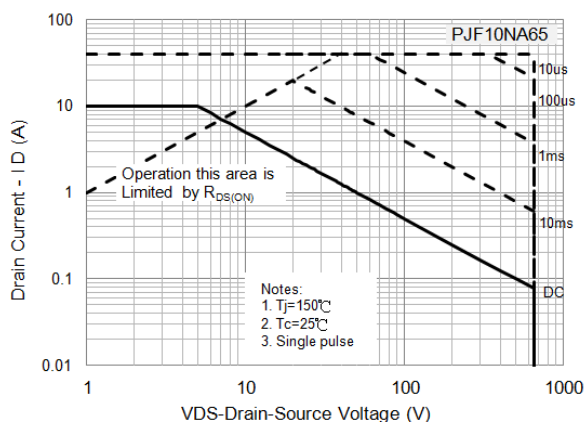
On-Resistance vs. Junction Temperature



Threshold Voltage Variation with Temperature

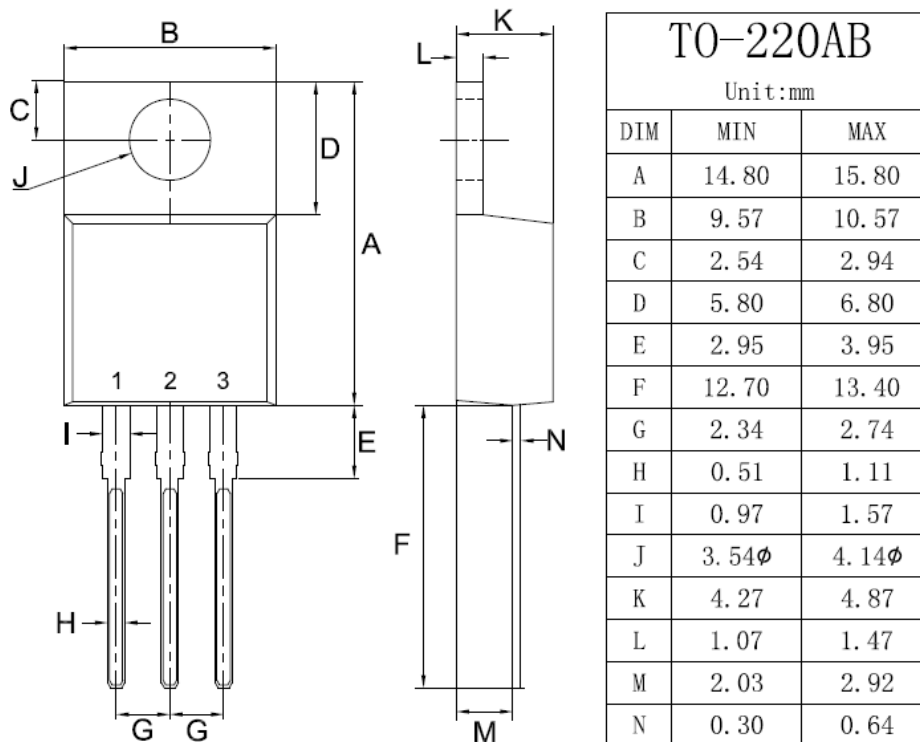


Maximum Safe Operating Area

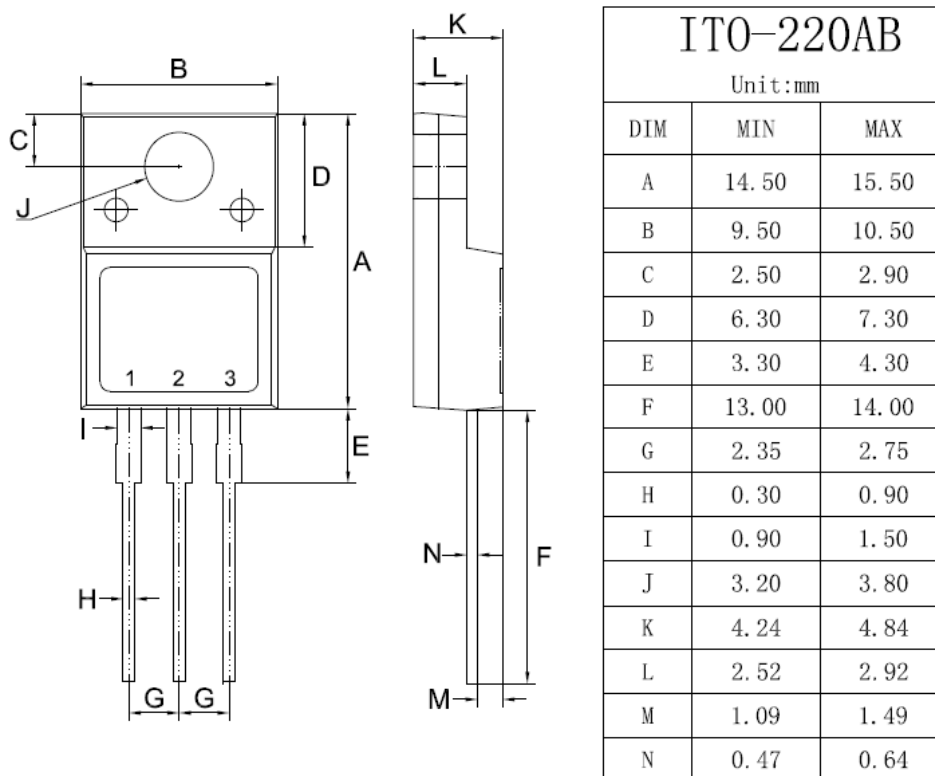


Maximum Safe Operating Area

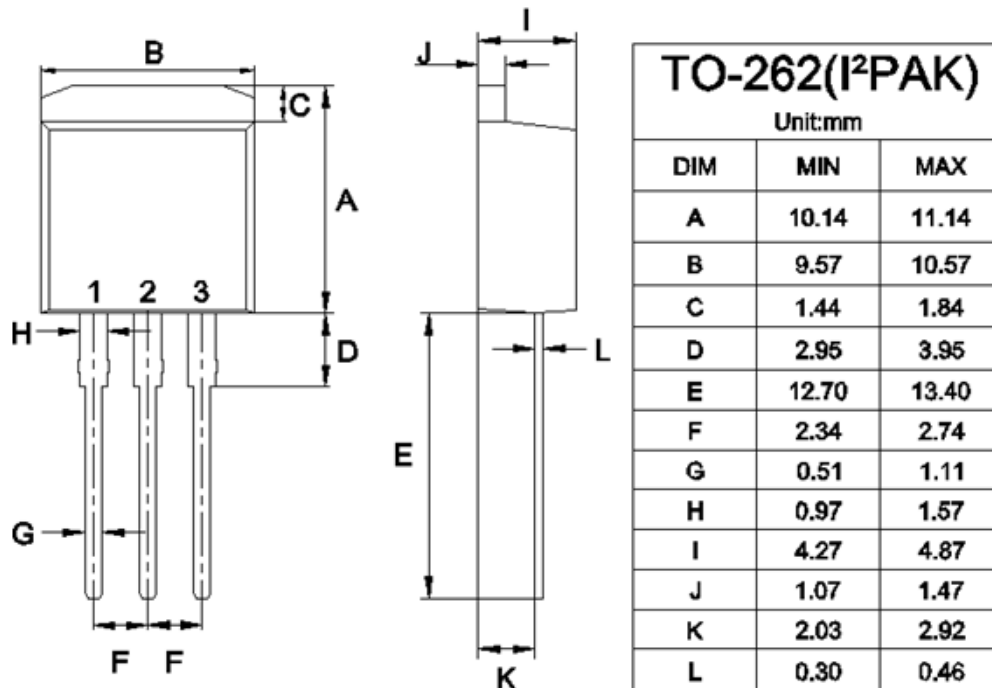
TO-220 Mechanical Drawing



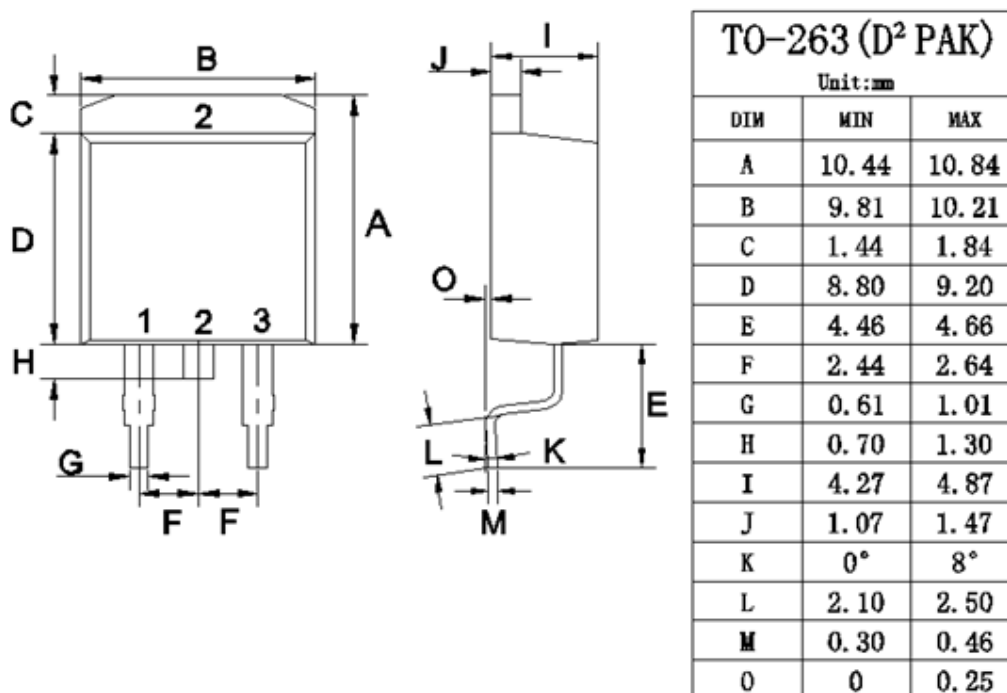
ITO-220 Mechanical Drawing



TO-262 Mechanical Drawing



TO-263 Mechanical Drawing



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