



6N70

700V N-Channel Power MOSFET

Features

- $R_{DS(on)}$, $V_{GS}@10V, I_D@3A < 2.3\Omega$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

Mechanical Data

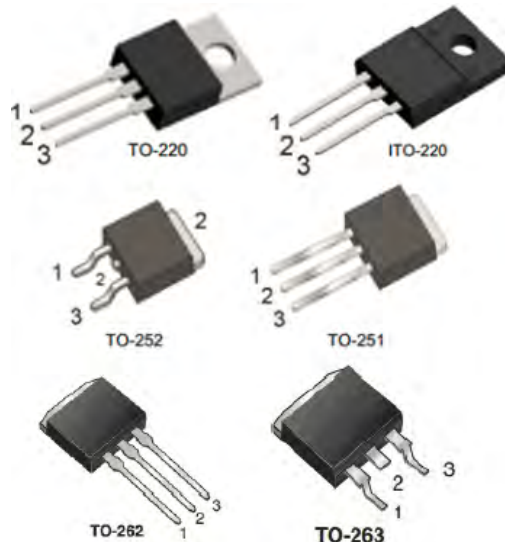
- Case: TO-251, TO-252, TO-220, ITO-220
TO-262, TO-263 Package

Ordering Information

Part No.	Package	Packing
DMP6N70-TU	TO-251	75pcs / Tube
DMD6N70-TR	TO-252	2.5Kpcs / 13" Reel
DMD6N70-TU	TO-252	75pcs / Tube
DMT6N70-TU	TO-220	50pcs / Tube
DMF6N70-TU	ITO-220	50pcs / Tube
DMK6N70-TU	TO-262	50pcs / Tube
DMG6N70-TU	TO-263	50pcs / Tube
DMG6N70-TR	TO-263	800pcs / 13" Reel

PRODUCT SUMMARY

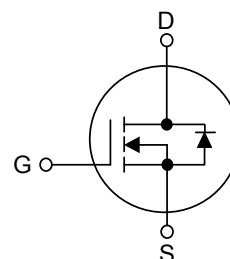
V_{DS} (V)	Current(A)	$R_{DS(on)}$ (Ω)
700	6	2.3 @ $V_{GS}=10V$



Pin Definition:

1. Gate
2. Drain
3. Source

Block Diagram



ABSOLUTE MAXIMUM RATINGS ($T_C=25^\circ\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DS}	700	V
Gate-Source Voltage		V_{GS}	± 30	V
Continuous Drain Current		I_D	6	A
Pulsed Drain Current		I_{DM}	24	A
Single Pulse Avalanche Energy ^(Note 1)		E_{AS}	321	mJ
Power Dissipation	TO-220/TO-262/TO-263	P_D	142	W
	ITO-220		45	W
Junction Temperature		T_J	+150	$^\circ\text{C}$
Operating Temperature		T_{OPR}	-55 ~ +150	$^\circ\text{C}$
Storage Temperature		T_{STG}	-55 ~ +150	$^\circ\text{C}$

NOTES :

1. $L=30\text{mH}$, $I_{AS}=4.5\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^\circ\text{C}$
2. Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$
3. Essentially independent of operating temperature typical characteristics.
4. Guaranteed by design, not subject to production testing



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THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/TO-262/TO-263	θ_{JA}	62.5	$^{\circ}\text{C/W}$
	ITO-220		120	
Junction to Case	TO-220/TO-262/TO-263	θ_{JC}	0.78	$^{\circ}\text{C/W}$
	ITO-220		2.78	

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

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNITS
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250uA	700	-	-	V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250uA	2	2.8	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3A	-	2	2.3	Ω
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =700V, V _{GS} =0V	-	0.03	1.0	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	±10	±100	nA
Diode Forward Voltage	V _{SD}	I _S =6A, V _{GS} =0V	-	0.87	1.4	V
Dynamic (Note 4)						
Total Gate Charge	Q _g	V _{DS} =560V, I _D =6A, V _{GS} =10V (Note 2,3)	-	16.5	-	nC
Gate-Source Charge	Q _{gs}		-	4.8	-	
Gate-Drain Charge	Q _{gd}		-	5.7	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	-	831	-	pF
Output Capacitance	C _{oss}		-	92	-	
Reverse Transfer Capacitance	C _{rss}		-	0.8	-	
Turn-On Delay Time	td _(on)	V _{DD} =350V, I _D =6A, R _G =25Ω (Note 2,3)	-	25	-	ns
Turn-On Rise Time	t _r		-	38	-	
Turn-Off Delay Time	td _(off)		-	49	-	
Turn-Off Fall Time	t _f		-	30	-	
Drain-Source Diode						
Maximum Continuous Drain-Source Diode Forward Current	I _S	---	-	-	6	A
Maximum Pulsed Drain-Source Diode Forward Current	I _{SM}	---	-	-	24	A
Reverse Recovery Time	trr	V _{GS} =0V, I _S =6A	-	531	-	ns
Reverse Recovery Charge	Qrr	dl _F / dt=100A/us (Note 2)	-	3.3	-	uC



TYPICAL CHARACTERISTICS

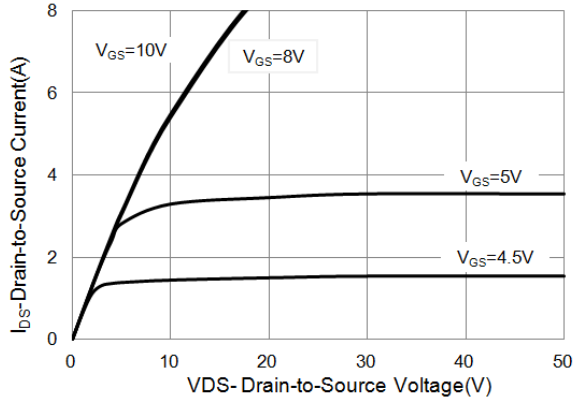


Fig.1 Output Characteristics

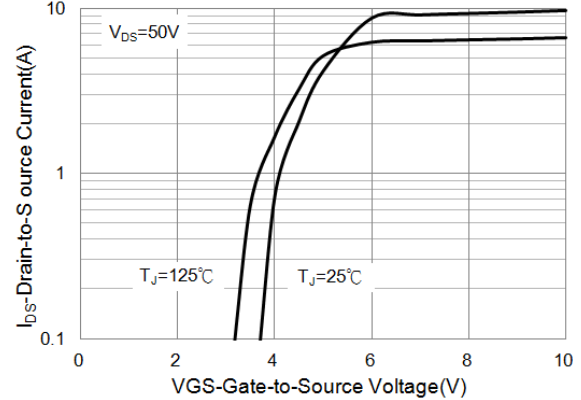


Fig.2 Transfer Characteristics

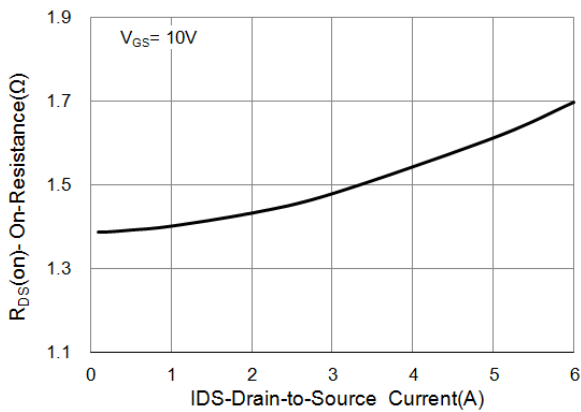


Fig.3 On-Resistance vs. Drain Current

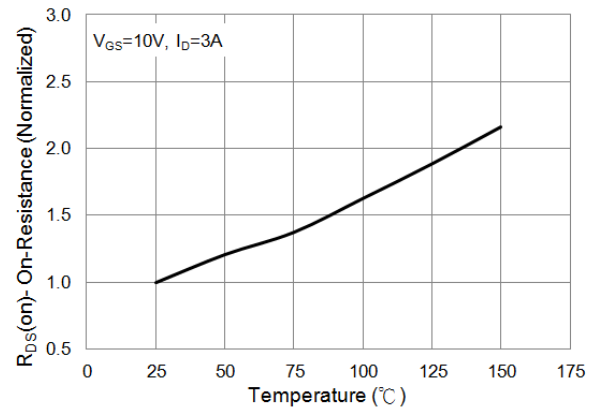


Fig.4 On-Resistance vs. Junction Temperature

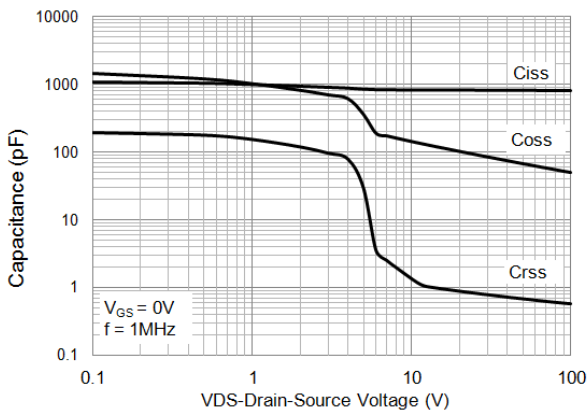


Fig.5 Capacitance vs. Drain-Source Voltage

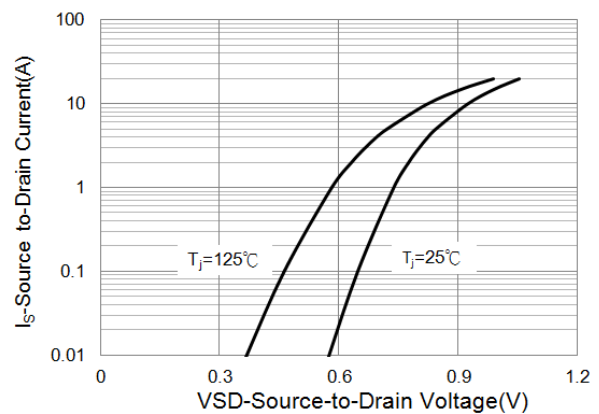


Fig.6 Source-Drain Diode Forward Voltage



TYPICAL CHARACTERISTICS

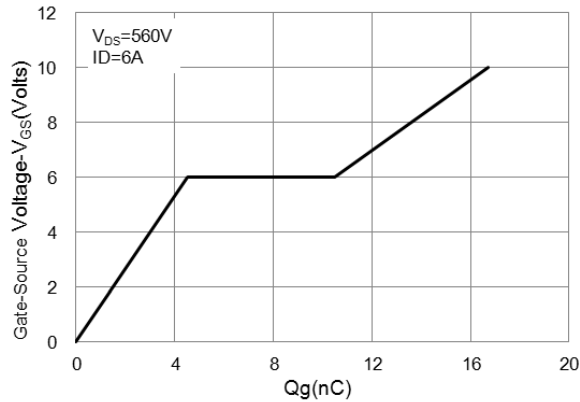


Fig.7 Gate Charge

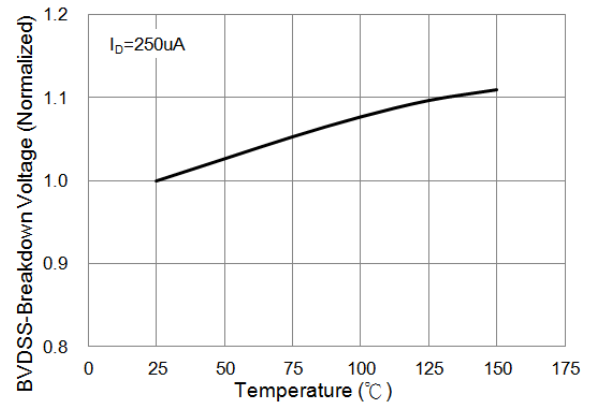


Fig.8 BV_{DS} vs. Junction Temperature

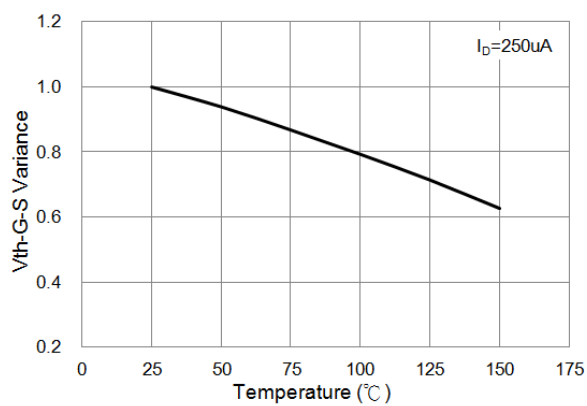


Fig.9 Threshold Voltage Variation with Temperature

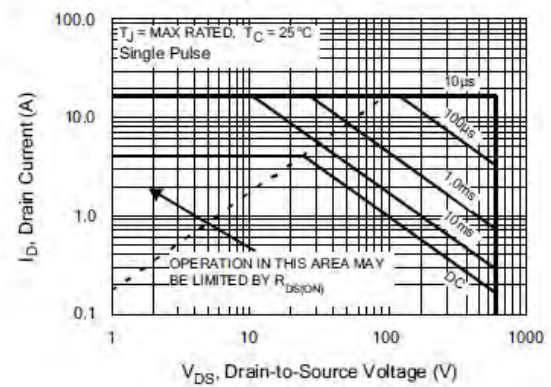


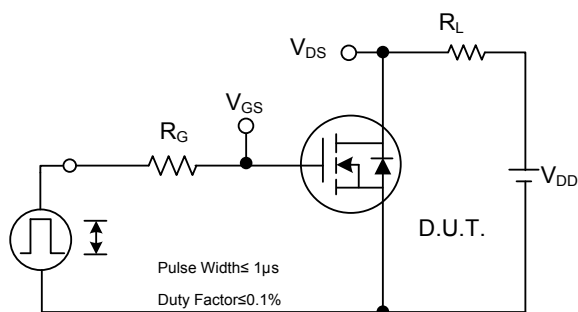
Fig.10 Maximum Safe Operating Area



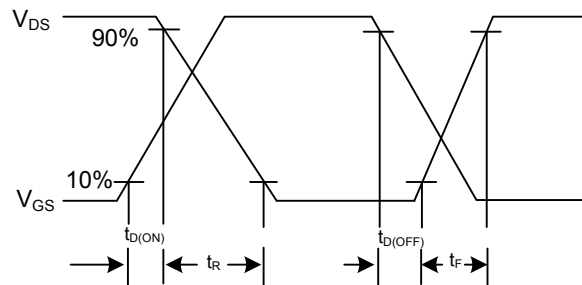
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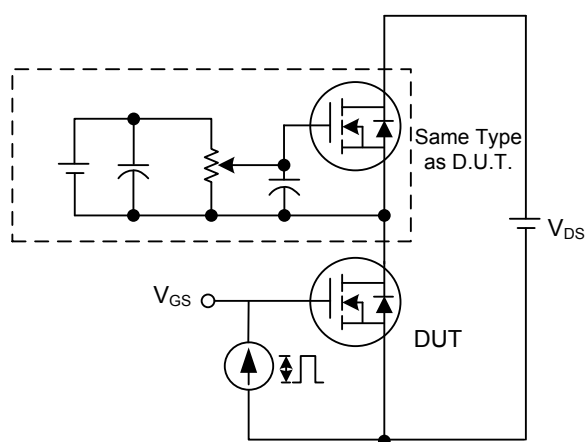
TEST CIRCUITS AND WAVEFORMS



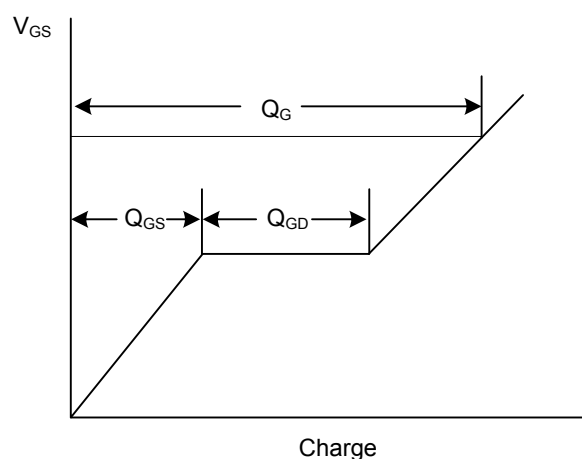
Switching Test Circuit



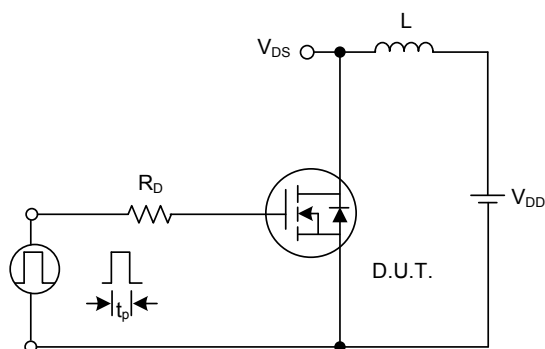
Switching Waveforms



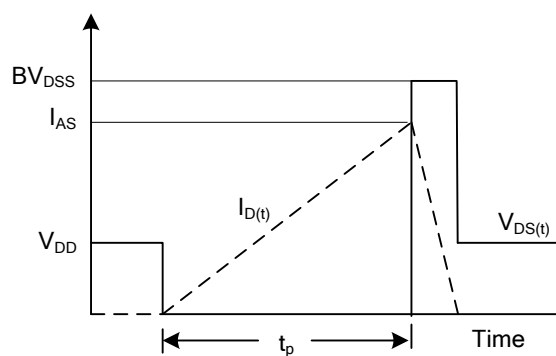
Gate Charge Test Circuit



Gate Charge Waveform



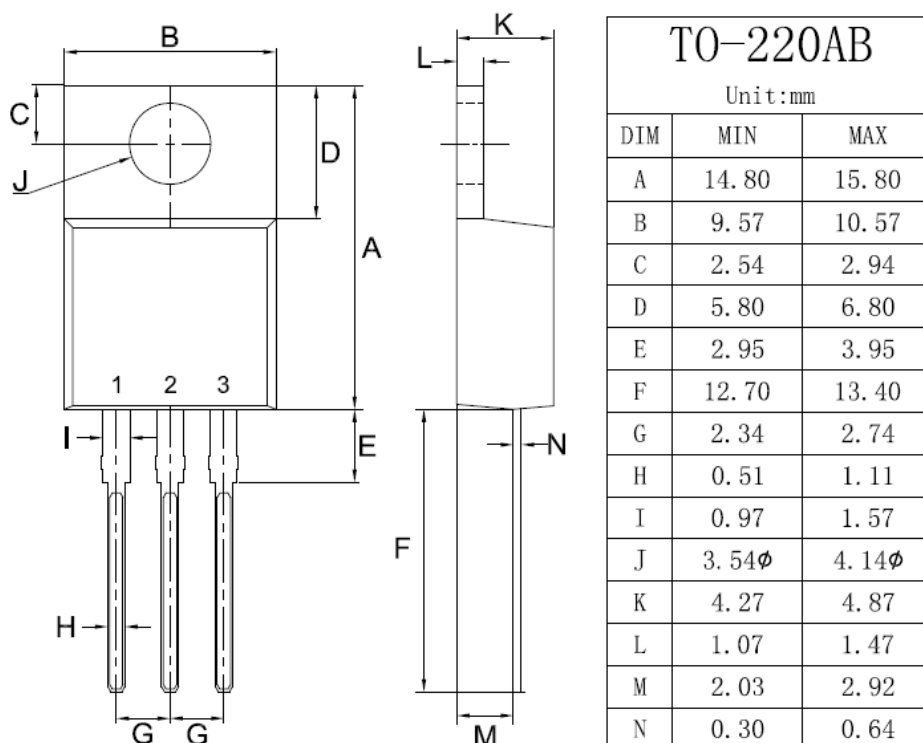
Unclamped Inductive Switching Test Circuit



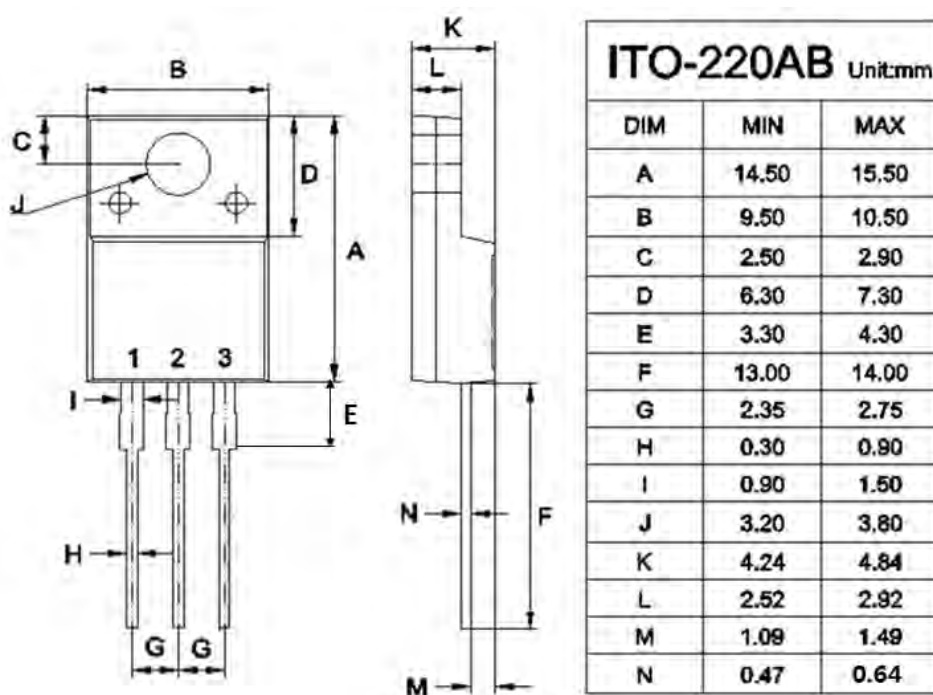
Unclamped Inductive Switching Waveforms



TO-220 Mechanical Drawing



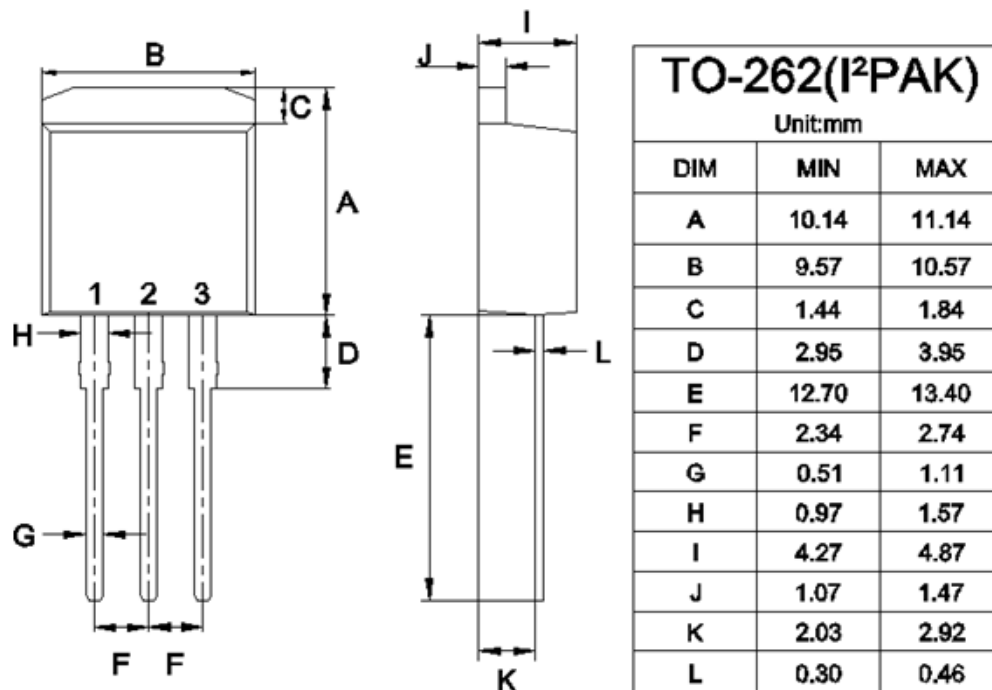
ITO-220 Mechanical Drawing



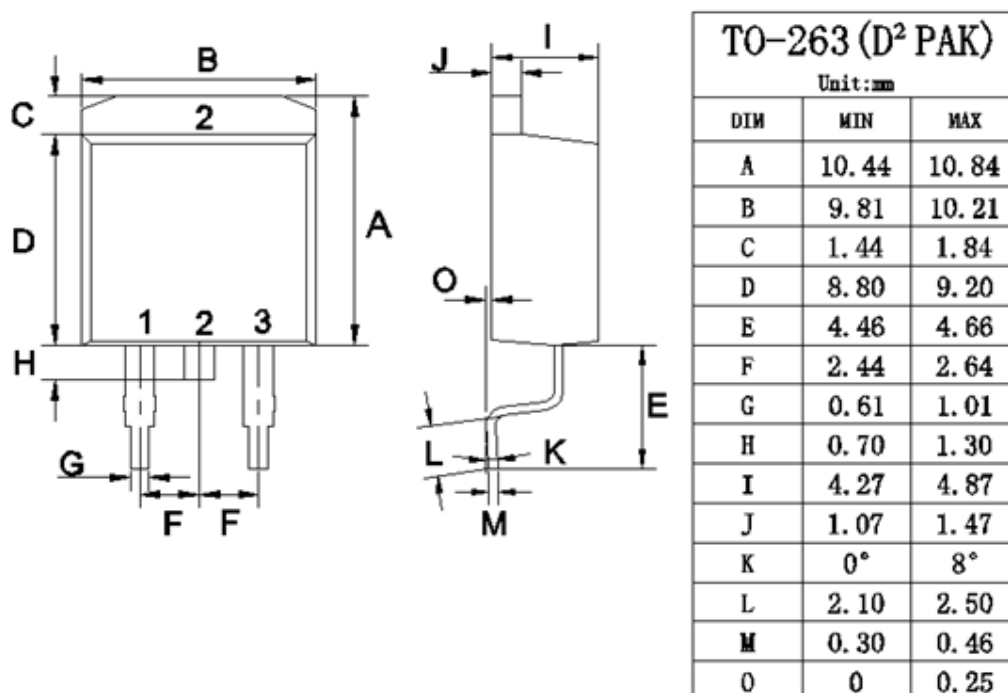
**6N70**

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TO-262 Mechanical Drawing



TO-263 Mechanical Drawing

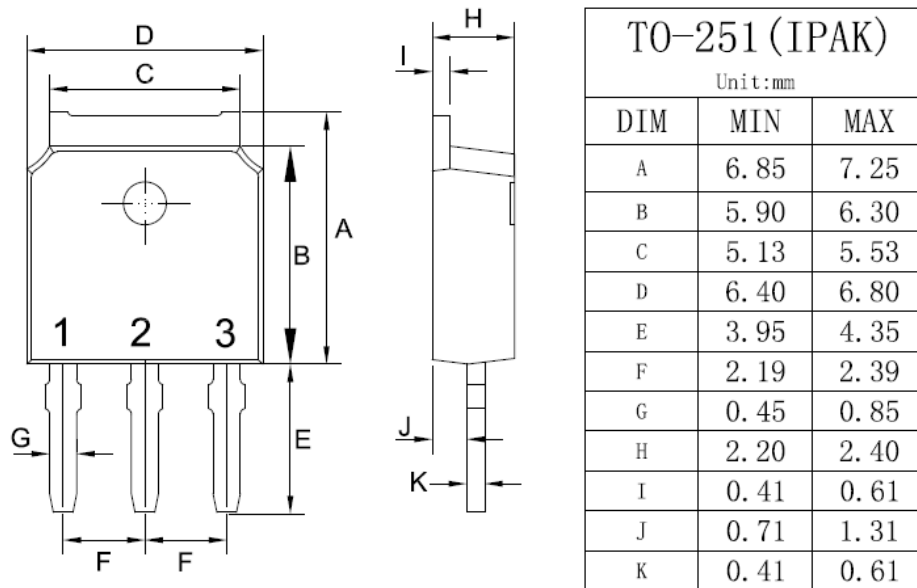




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TO-251 Mechanical Drawing



TO-252 Mechanical Drawing

