



7N70

700V N-Channel Power MOSFET

Features

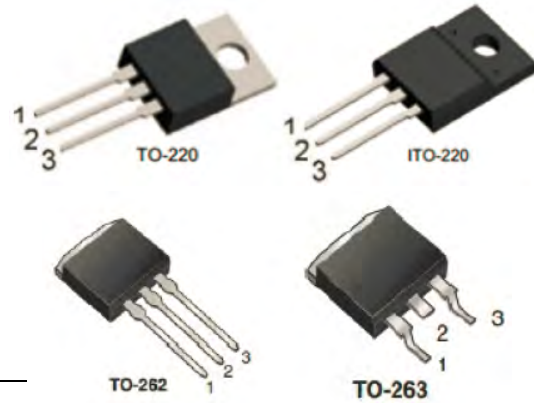
- $R_{DS(on)}$, $V_{GS}@10V, I_D@3.5A < 1.6\Omega$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

PRODUCT SUMMARY

V_{DS} (V)	Current(A)	$R_{DS(on)}$ (Ω)
700	7	1.6 @ $V_{GS}=10V$

Mechanical Data

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



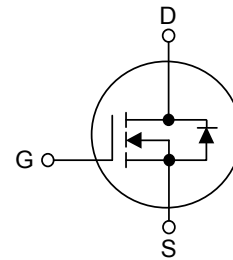
Pin Definition:

1. Gate
2. Drain
3. Source

Ordering Information

Part No.	Package	Packing
DMT7N70-TU	TO-220	50pcs / Tube
DMF7N70-TU	ITO-220	50pcs / Tube
DMK7N70-TU	TO-262	50pcs / Tube
DMG7N70-TU	TO-263	50pcs / Tube
DMG7N70-TR	TO-263	800pcs / 13" Reel

Block Diagram



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

PARAMETER		SYMBOL	RATINGS	UNIT
Drain-Source Voltage		V_{DSS}	700	V
Gate-Source Voltage		V_{GSS}	± 30	V
Continuous Drain Current		I_D	7	A
Pulsed Drain Current		I_{DM}	28	A
Single Pulse Avalanche Energy ^(Note 1)		E_{AS}	530	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. $L=19.5\text{mH}$, $I_{AS}=7\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\text{ohm}$, 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

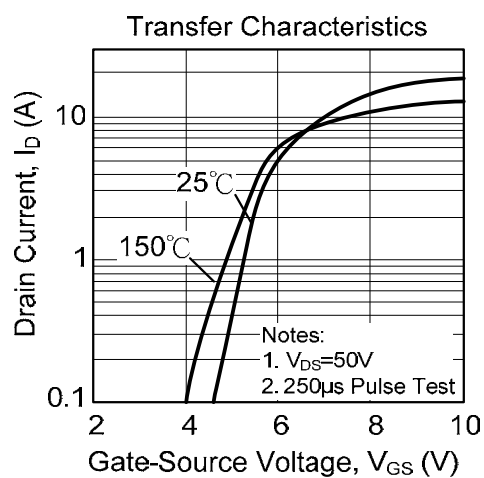
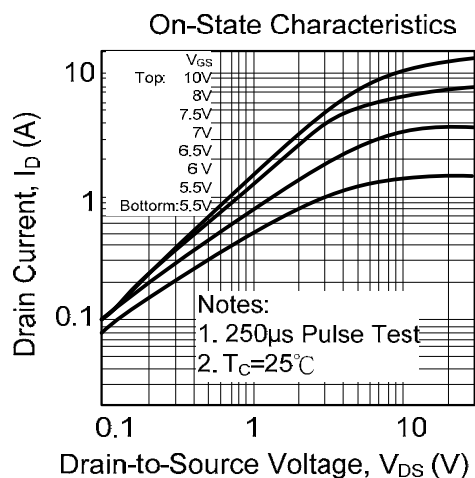
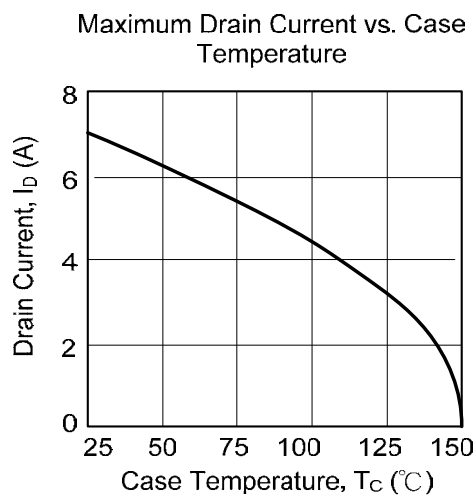
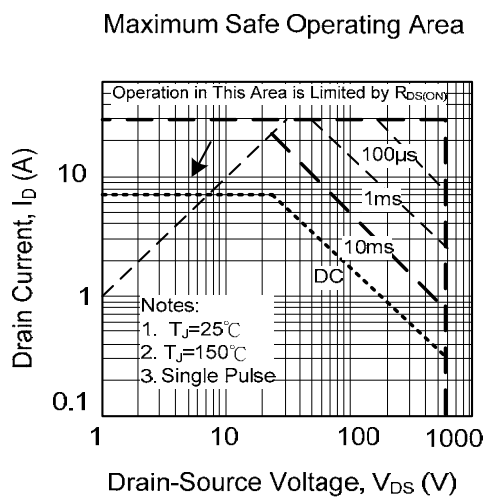
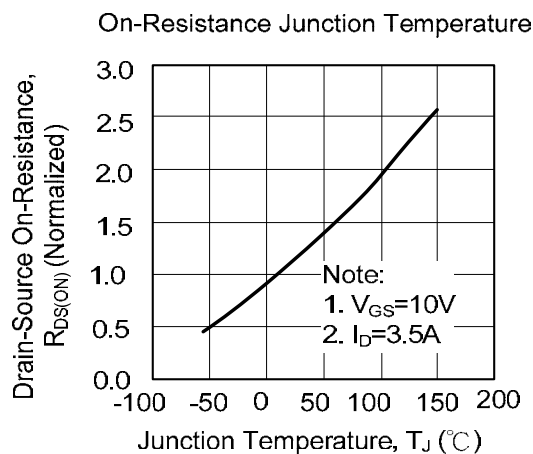
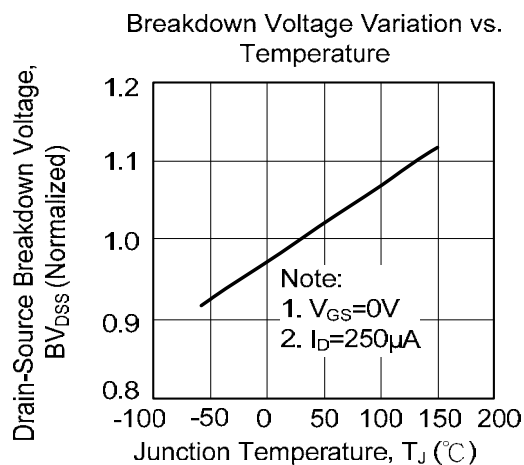
PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/TO-262/TO-263 ITO-220	θ_{JA}	62.5	$^{\circ}\text{C/W}$
Junction to Case	TO-220/TO-262/TO-263	θ_{JC}	0.9	$^{\circ}\text{C/W}$
	ITO-220		2.6	

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	-	4	V
Drain-Source On-State Resistance	R _{DS(on)}	V _{GS} =10V, I _D =3.5A	-	1.4	1.6	Ω
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =700V, V _{GS} =0V	-	-	1.0	uA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Diode Forward Voltage	V _{SD}	I _S =7A, V _{GS} =0V	-	-	1.4	V
Dynamic (Note 4)						
Total Gate Charge	Q _g	V _{DS} =100V, I _D =7A, V _{GS} =10V (Note 2,3)	-	163	-	nC
Gate-Source Charge	Q _{gs}		-	12	-	
Gate-Drain Charge	Q _{gd}		-	30	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHZ	-	1200	1600	pF
Output Capacitance	C _{oss}		-	150	190	
Reverse Transfer Capacitance	C _{rss}		-	60	80	
Turn-On Delay Time	t _{d(on)}	V _{DD} =30V, I _D =1A, R _G =25Ω (Note 2,3)	-	60	80	ns
Turn-On Rise Time	t _r		-	200	230	
Turn-Off Delay Time	t _{d(off)}		-	280	350	
Turn-Off Fall Time	t _f		-	250	300	
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 =7A	-	320	-	ns
Reverse Recovery Charge	Qrr	dl _F / dt=100A/us (Note 2)	-	2.4	-	uC



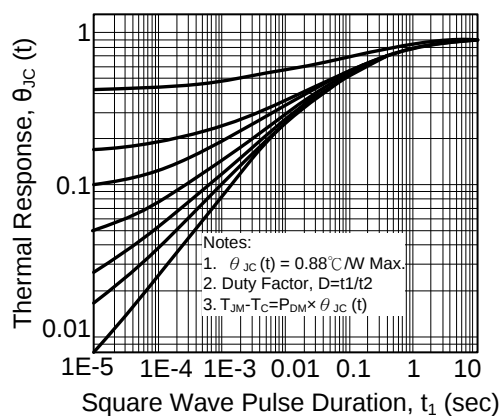
TYPICAL CHARACTERISTICS



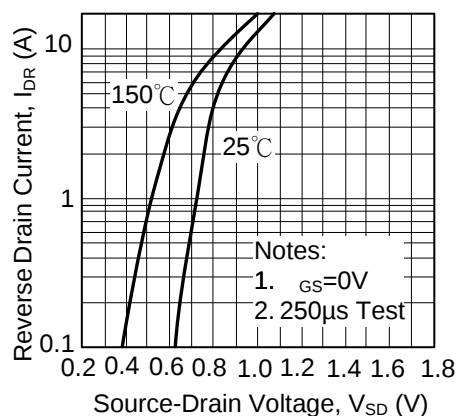


TYPICAL CHARACTERISTICS

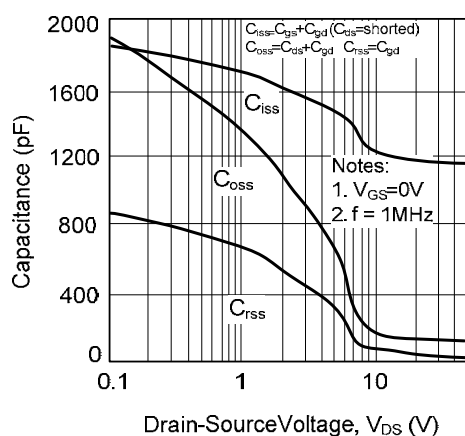
Transient Thermal Response Curve



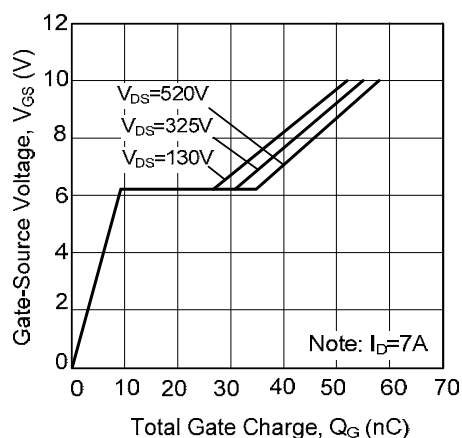
On State Current vs.
Allowable Case Temperature



Capacitance Characteristics
(Non-Repetitive)

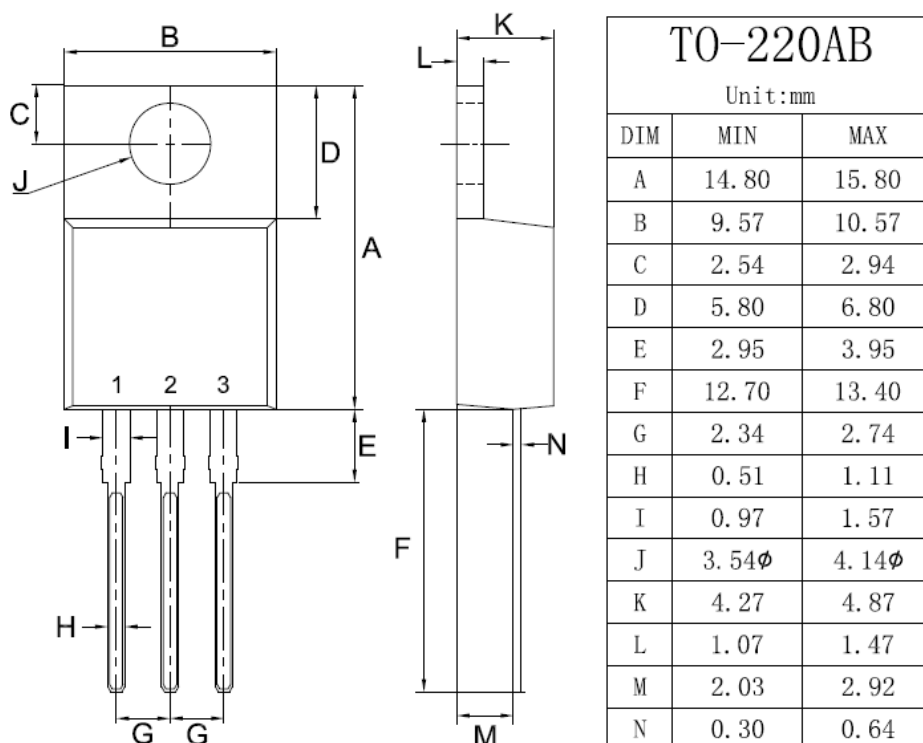


Gate Charge Characteristics

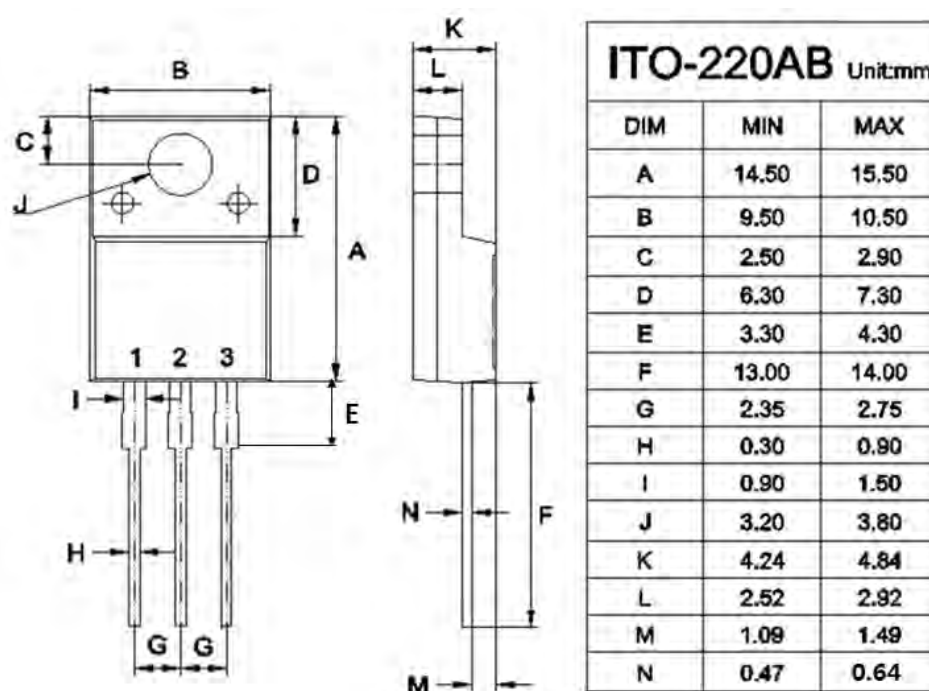




TO-220 Mechanical Drawing



ITO-220 Mechanical Drawing

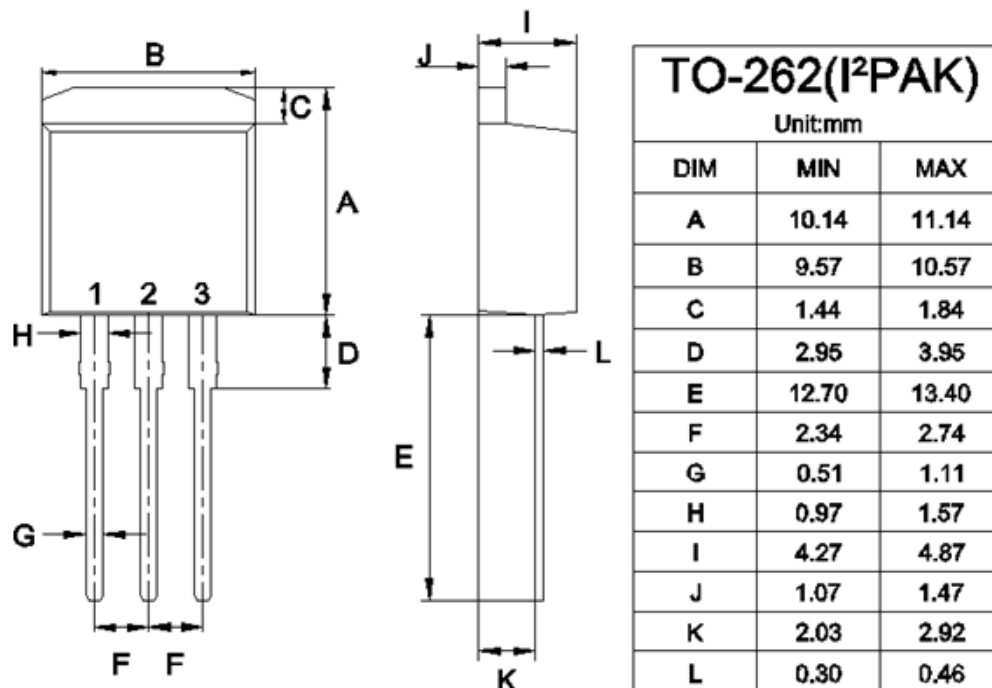




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TO-262 Mechanical Drawing



TO-263 Mechanical Drawing

