

Features

- $R_{DS(ON)} < 4.4\Omega @ V_{GS} = 10V, I_D = 1A$
- Fast switching capability
- Lead free in compliance with EU RoHS directive.
- Improved dv/dt capability, high ruggedness

PRODUCT SUMMARY

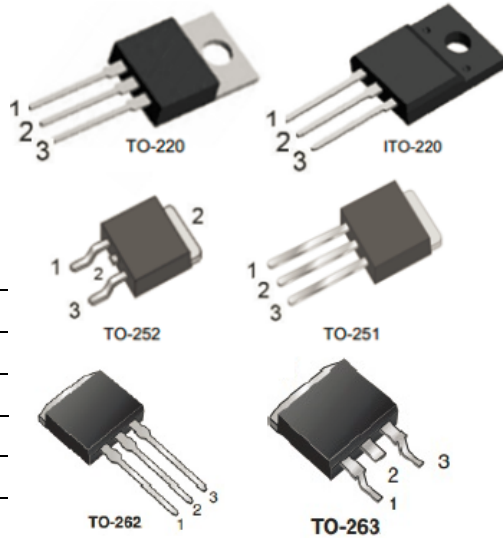
V_{DS} (V)	$R_{DS(on)}$ (Ω)	Current
650	4.4 @ $V_{GS}=10V$	2A

Mechanical Data

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

Ordering Information

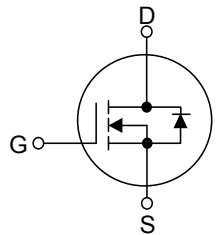
Part No.	Package	Packing
DMP2N65-TU	TO-251	75pcs / Tube
DMD2N65-TR	TO-252	2.5Kpcs / 13" Reel
DMD2N65-TU	TO-252	75pcs / Tube
DMT2N65-TU	TO-220	50pcs / Tube
DMF2N65-TU	ITO-220	50pcs / Tube
DMK2N65-TU	TO-262	50pcs / Tube
DMG2N65-TU	TO-263	50pcs / Tube
DMG2N65-TR	TO-263	800pcs / 13" Reel



Pin Definition:

1. Gate
2. Drain
3. Source

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
Avalanche Current (Note 2)		I_{AR}	2.0	A
Continuous Drain Current		I_D	2.0	A
Pulsed Drain Current (Note 2)		I_{DM}	8.0	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	115	mJ
Power Dissipation	TO-220/TO-262/TO-263	P_D	44	W
	ITO-220		23	W
	TO-251/TO-252		34	W
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 maximum junction temperature

3. $L = 30mH, I_{AS} = 2.7A, V_{DD} = 50V, R_G = 25 \Omega$, Starting $T_J = 25^\circ C$

THERMAL DATA

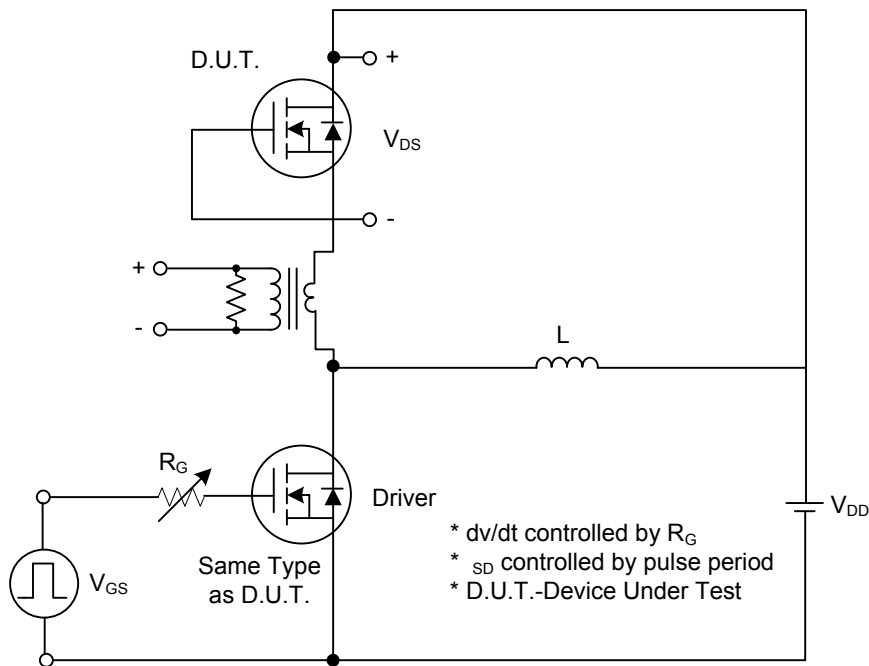
PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ITO-220 TO-262/TO-263	θ_{JA}	62.5	°C/W
	TO-251/ TO-252		110	
Junction to Case	TO-220/ITO-220 TO-262/TO-263	θ_{JC}	2.35	°C/W
	ITO-220		5.5	
	TO-251/ TO-252		2.9	

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

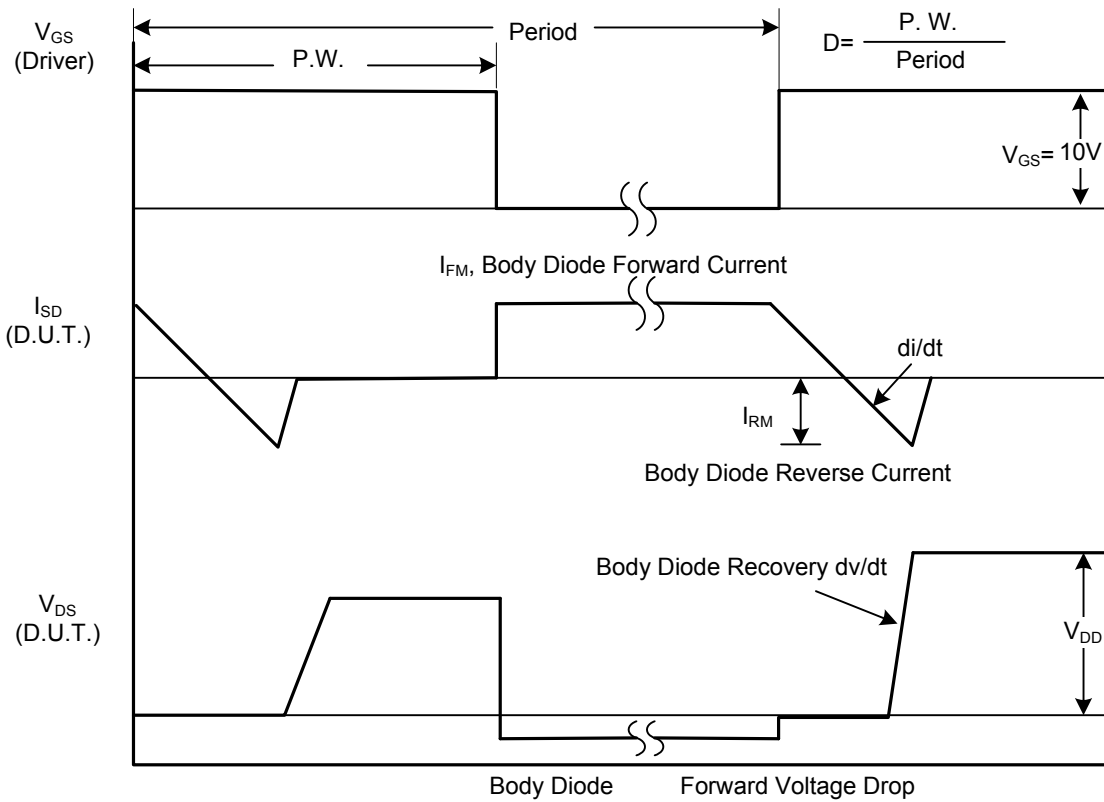
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	650			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS} = 650V, V_{GS} = 0V$			10	μA
Gate-Source Leakage Current	Forward	I_{GSS}	$V_{GS} = 30V, V_{DS} = 0V$			100	nA
	Reverse		$V_{GS} = -30V, V_{DS} = 0V$			-100	nA
ON CHARACTERISTICS							
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0		4.0	V
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 1A$		4	4.4	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$		300	-	pF
Output Capacitance		C_{OSS}			45	-	pF
Reverse Transfer Capacitance		C_{RSS}			2	-	pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		$t_{D(ON)}$	$V_{DD} = 300V, I_D = 2A,$ $R_G = 25\Omega$ (Note 1, 2)		10	-	ns
Turn-On Rise Time		t_R			25	-	ns
Turn-Off Delay Time		$t_{D(OFF)}$			20	-	ns
Turn-Off Fall Time		t_F			25	-	ns
Total Gate Charge		Q_G	$V_{DS} = 480V, I_D = 2.4A,$ $V_{GS} = 10V$ (Note 1, 2)		5.7	-	nC
Gate-Source Charge		Q_{GS}			1.8	-	nC
Gate-Drain Charge		Q_{GD}			2	-	nC
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS							
Drain-Source Diode Forward Voltage		V_{SD}	$V_{GS} = 0V, I_{SD} = 2.0A$			1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I_S				2.0	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				8.0	A
Reverse Recovery Time		t_{rr}	$V_{GS} = 0V, I_S = 2A,$		357		ns
Reverse Recovery Charge		Q_{RR}	$dI_F/dt = 100A/\mu s$ (Note 1)		2		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

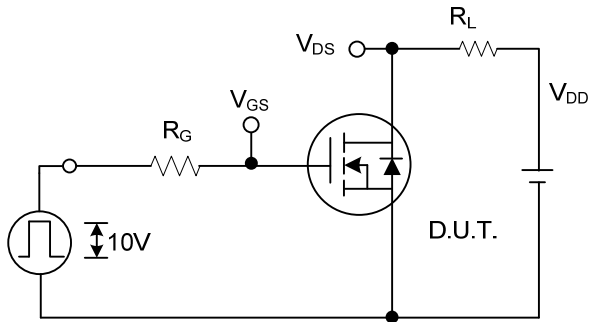


Peak Diode Recovery dv/dt Test Circuit

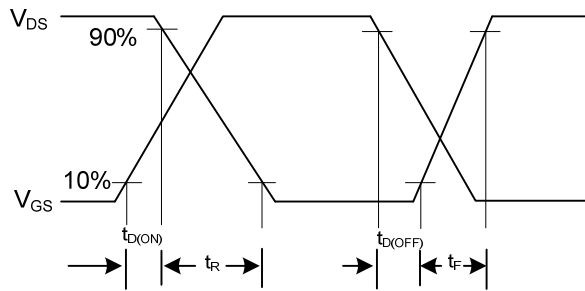


Peak Diode Recovery dv/dt Waveforms

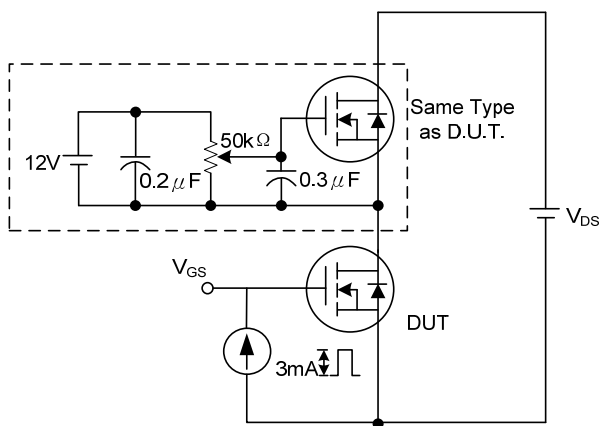
TEST CIRCUITS AND WAVEFORMS(Cont.)



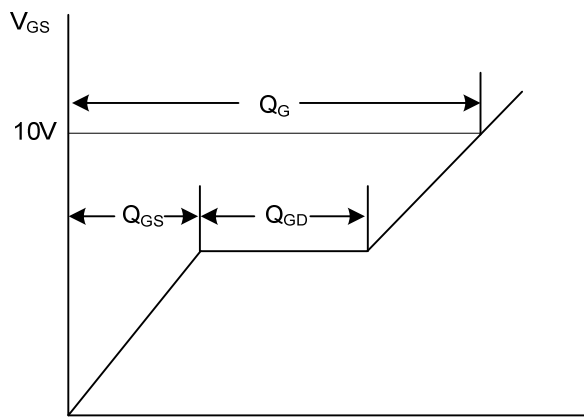
Switching Test Circuit



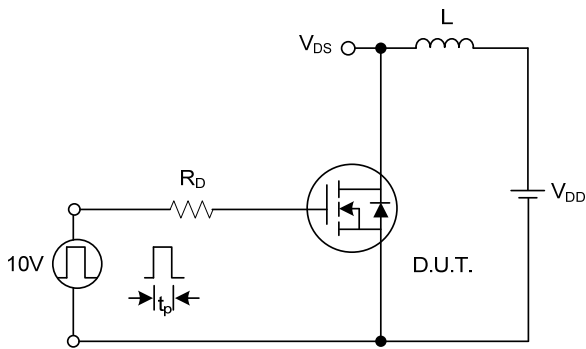
Switching Waveforms



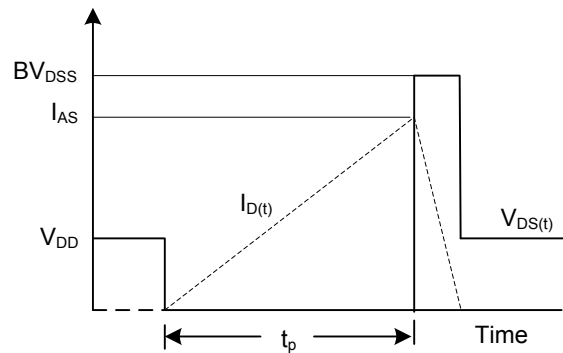
Gate Charge Test Circuit



Charge
Gate Charge Waveform

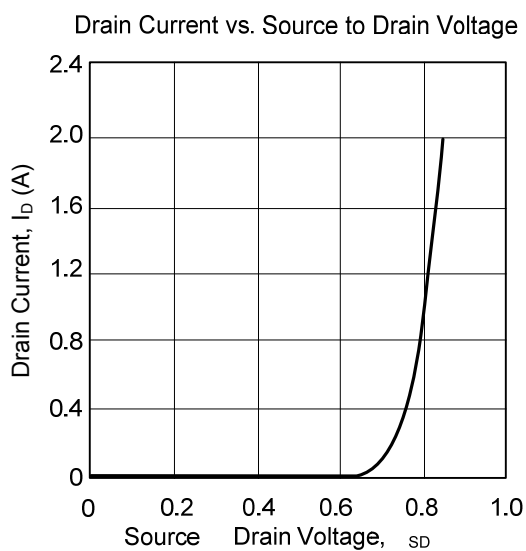
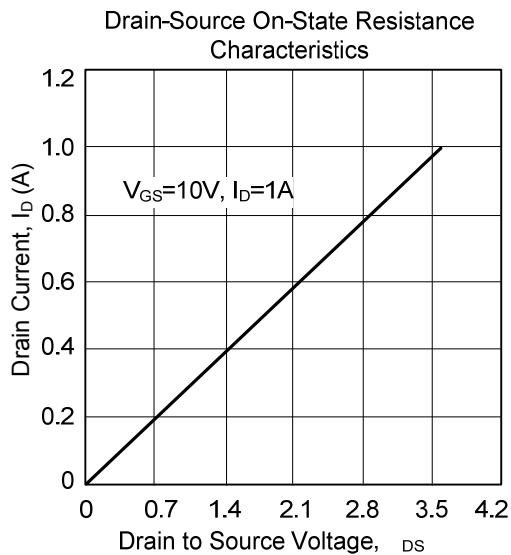
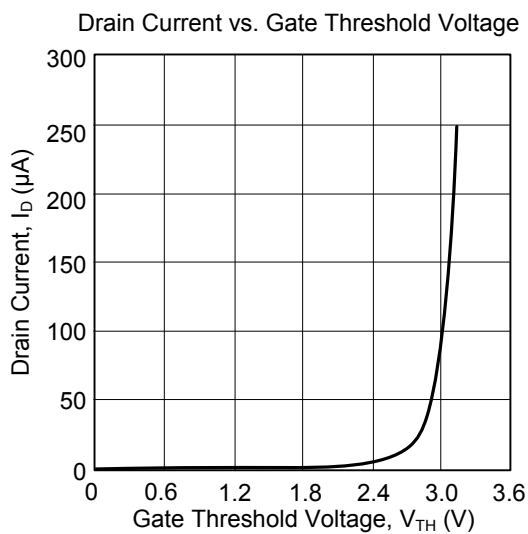
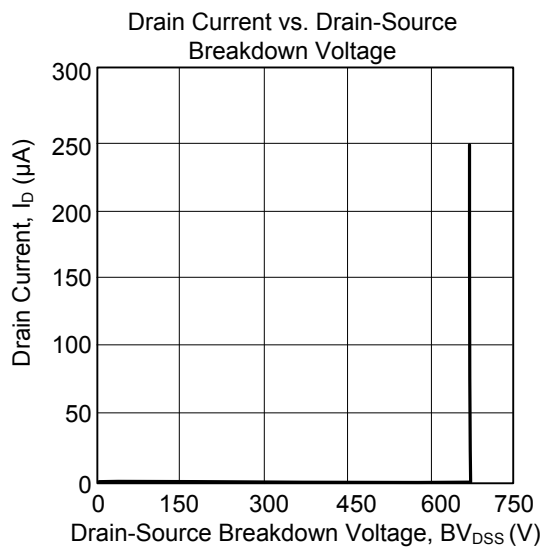


Unclamped Inductive Switching Test Circuit

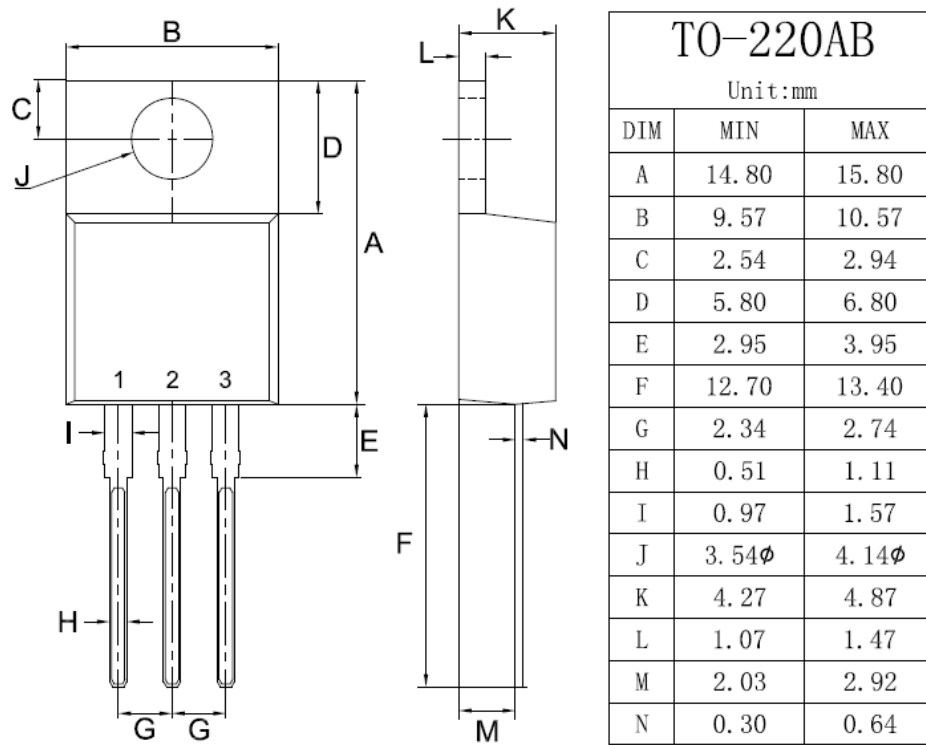


Unclamped Inductive Switching Waveforms

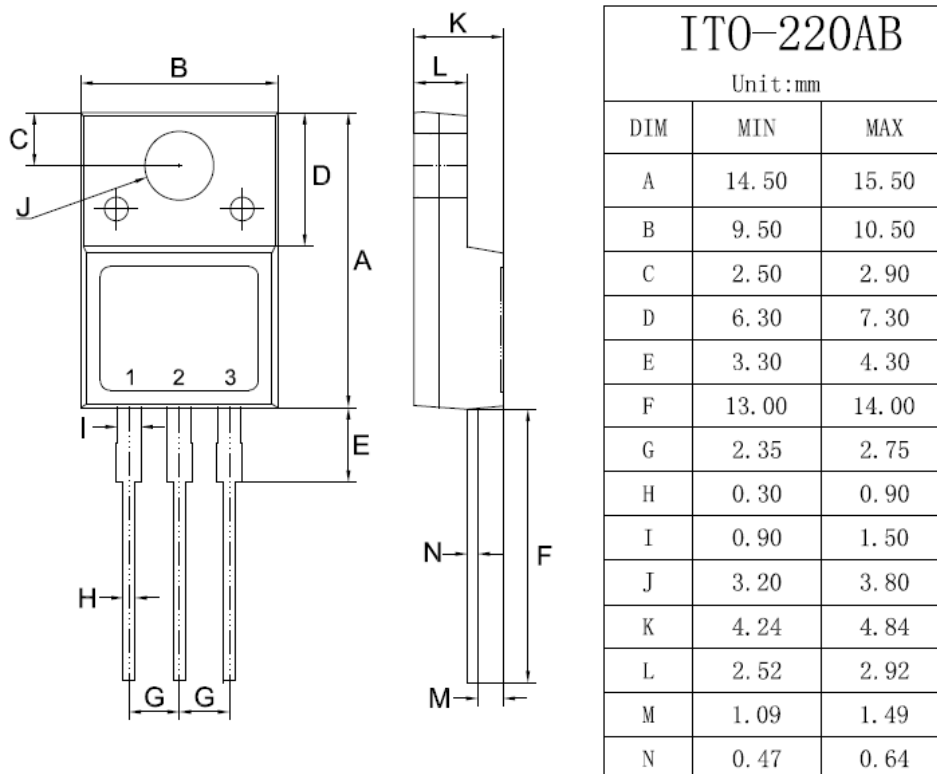
TYPICAL CHARACTERISTICS



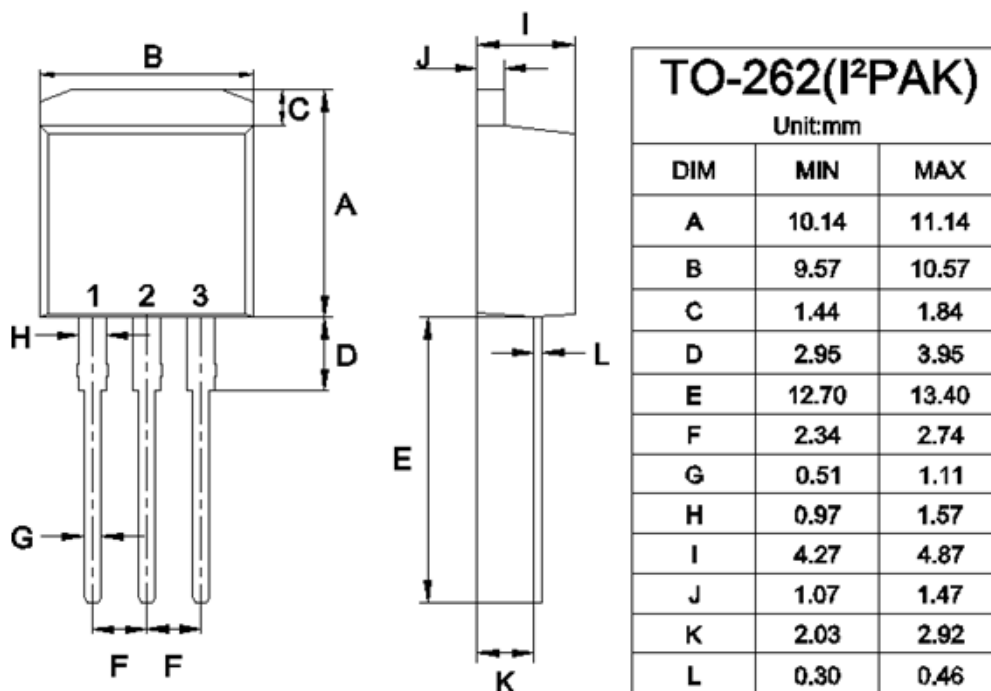
TO-220 Mechanical Drawing



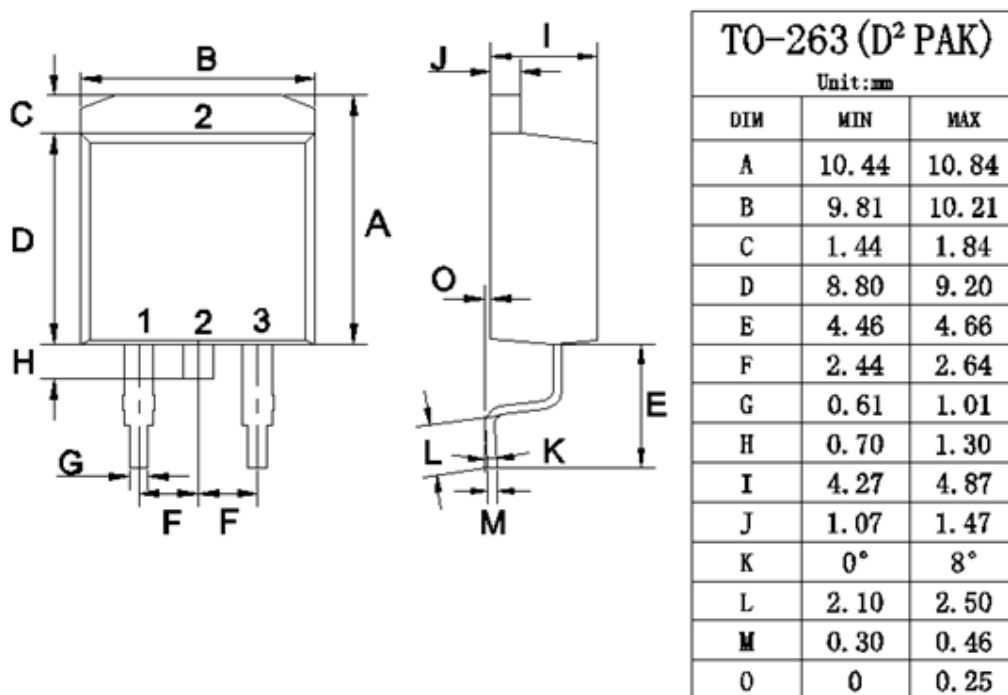
ITO-220 Mechanical Drawing



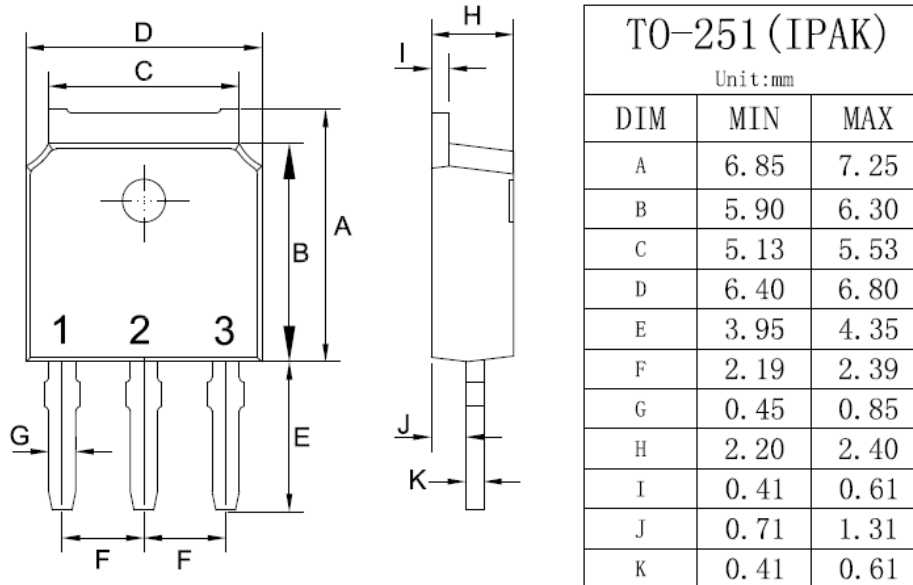
TO-262 Mechanical Drawing



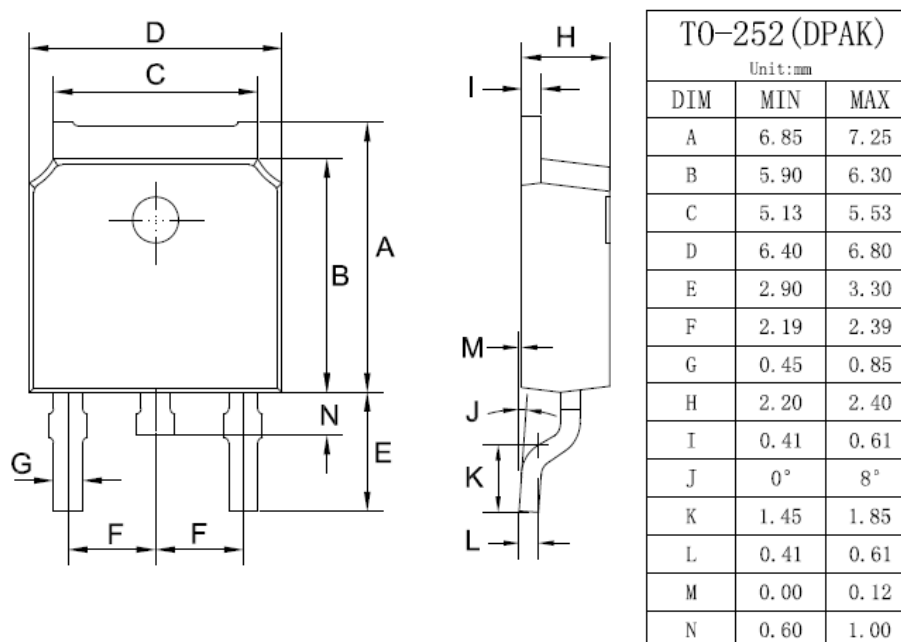
TO-263 Mechanical Drawing



TO-251 Mechanical Drawing



TO-252 Mechanical Drawing



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