

Features

- $R_{DS(ON)} < 1.4\Omega$ @ $V_{GS} = 10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

Mechanical Data

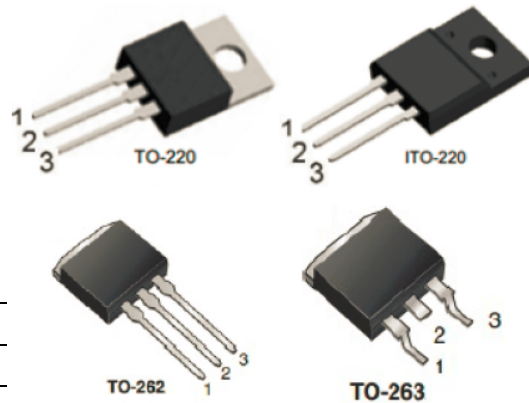
- Case: TO-220, ITO-220, TO-262, TO-263 Package

Ordering Information

Part No.	Package	Packing
DMT8N65-TU	TO-220	50pcs / Tube
DMF8N65-TU	ITO-220	50pcs / Tube
DMK8N65-TU	TO-262	50pcs / Tube
DMG8N65-TU	TO-263	50pcs / Tube
DMG8N65-TR	TO-263	800pcs / 13" Reel

PRODUCT SUMMARY

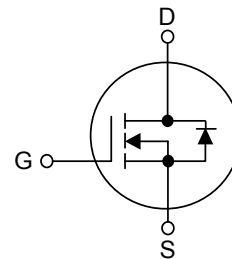
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
650	1.4 @ $V_{GS} = 10V$	8



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}	8	A	
Continuous Drain Current	I_D	8	A	
Pulsed Drain Current (Note 2)	I_{DM}	32	A	
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	230	mJ
Peak Diode Recovery dv/dt (Note 4)	dv/dt	4.5	ns	
Power Dissipation	TO-220/TO-262/TO-263	P_D	142	W
	ITO-220		48	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 T_J

3. $L = 7.1mH$, $I_{AS} = 8A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$

4. $I_{SD} \leq 7.5A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ C$

THERMAL DATA

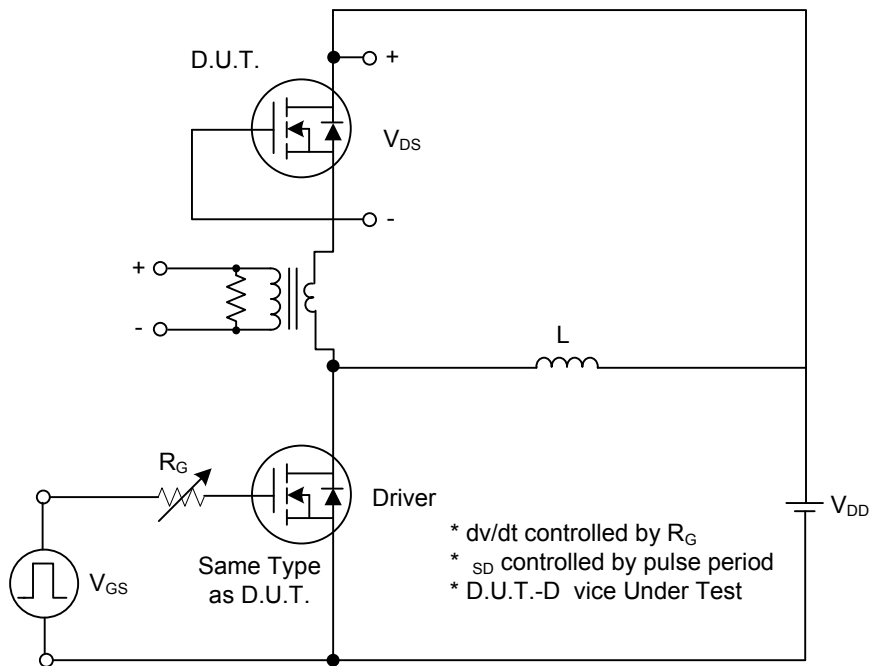
PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ITO-220 TO-262/TO-263	θ_{JA}	62.5	$^{\circ}\text{C/W}$
Junction to Case	TO-220/TO-262/TO-263	θ_{JC}	0.85	$^{\circ}\text{C/W}$
	ITO-220		2.6	

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

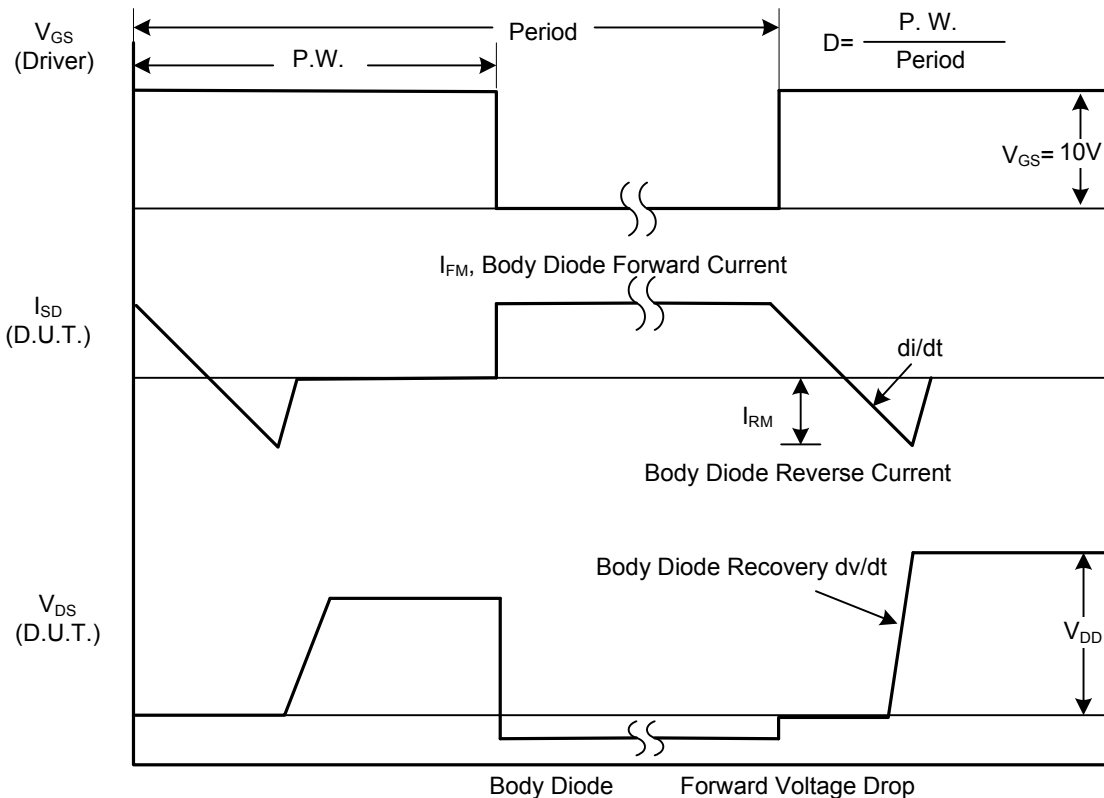
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV_{DSS}	$V_{GS}=0V, I_D=250\mu A$	650			V
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=650V, V_{GS}=0V$			10	μA
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=30V, V_{DS}=0V$			100	nA
	Reverse		$V_{GS}=-30V, V_{DS}=0V$			-100	nA
Breakdown Voltage Temperature Coefficient		$\Delta BV_{DSS}/\Delta T_J$	$I_D=250\mu A$, Referenced to 25°C		0.7		$V/^{\circ}\text{C}$
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		$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 4A$		1.2	1.4	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C_{ISS}	$V_{DS}=25V, V_{GS}=0V, f=1.0\text{ MHz}$		1145	1255	pF
Output Capacitance		C_{OSS}			118	135	pF
Reverse Transfer Capacitance		C_{RSS}			19	25	pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		$t_{D(ON)}$	$V_{DD} = 520V, I_D = 8A,$ $R_G = 25\Omega$ (Note 1, 2)		84	100	ns
Turn-On Rise Time		t_R			100	130	ns
Turn-Off Delay Time		$t_{D(OFF)}$			275	320	ns
Turn-Off Fall Time		t_F			64.5	140	ns
Total Gate Charge		Q_G	$V_{DS}=480V, I_D=8A,$ $V_{GS}=10V$ (Note 1, 2)		115	130	nC
Gate-Source Charge		Q_{GS}			12		nC
Gate-Drain Charge		Q_{GD}			40		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Drain-Source Diode Forward Voltage		V_{SD}	$V_{GS} = 0V, I_S = 8A$			1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I_S				8	A
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				32	A
Reverse Recovery Time		t_{rr}	$V_{GS}=0V, I_S=8A,$		365		ns
Reverse Recovery Charge		Q_{RR}	$di_F/dt = 100\text{ A}/\mu\text{s}$ (Note 1)		3.4		μC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
2. Essentially independent of operating temperature.

TEST CIRCUITS AND WAVEFORMS

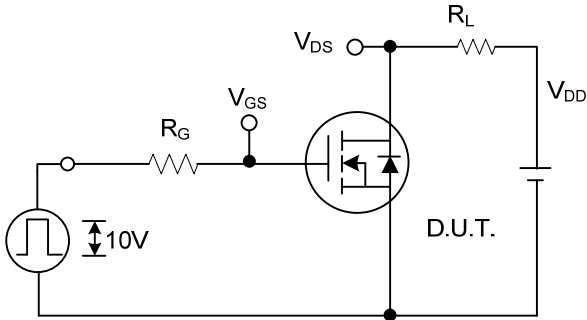


Peak Diode Recovery dv/dt Test Circuit

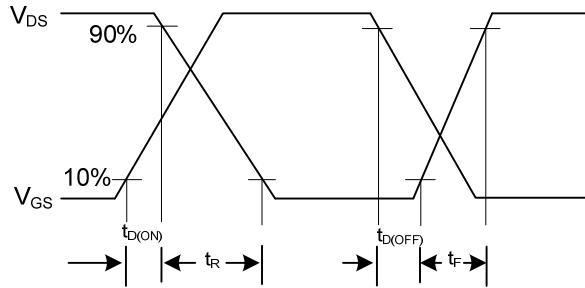


Peak Diode Recovery dv/dt Waveforms

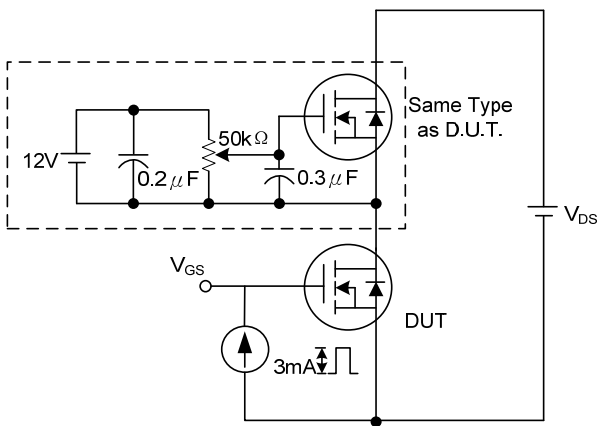
TEST CIRCUITS AND WAVEFORMS(Cont.)



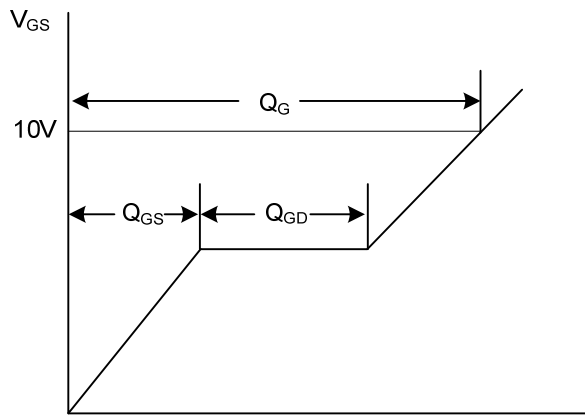
Switching Test Circuit



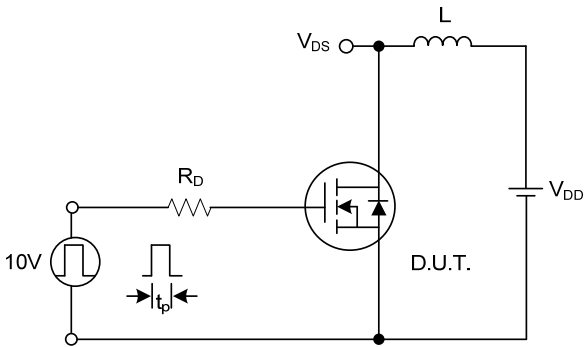
Switching Waveforms



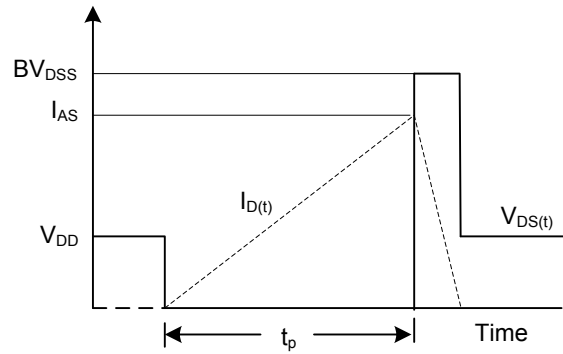
Gate Charge Test Circuit



Charge
Gate Charge Waveform

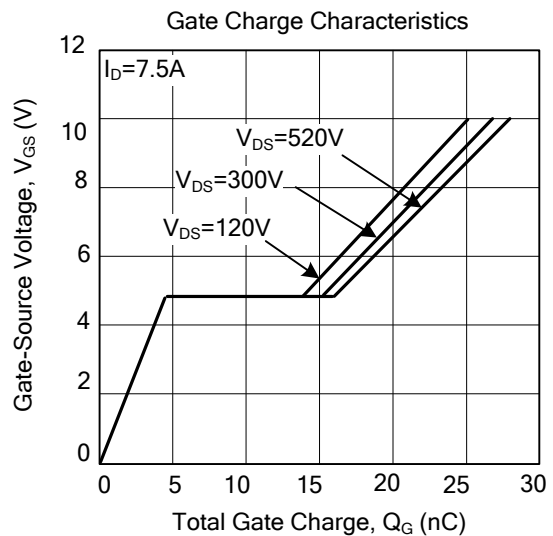
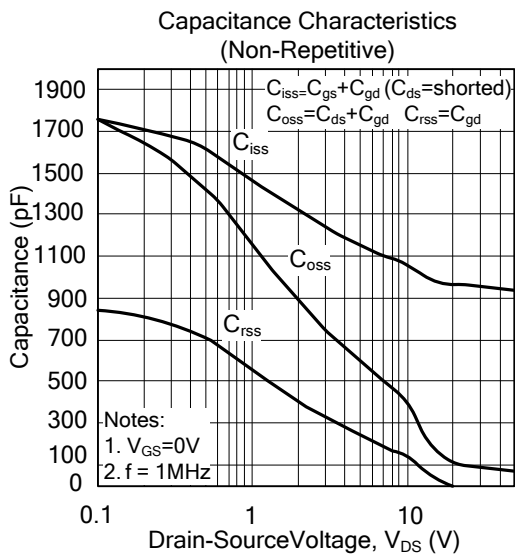
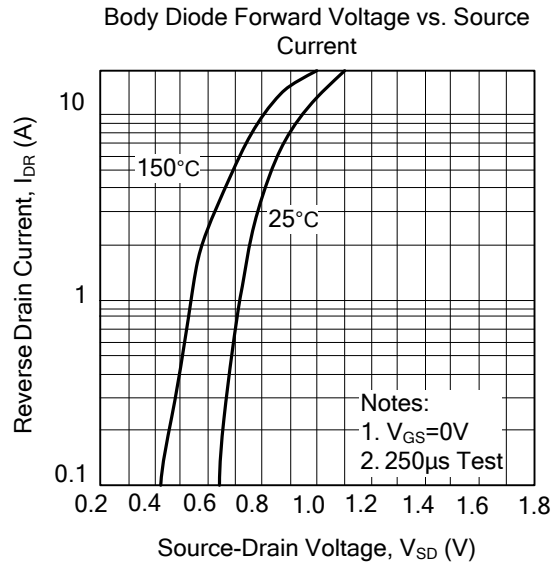
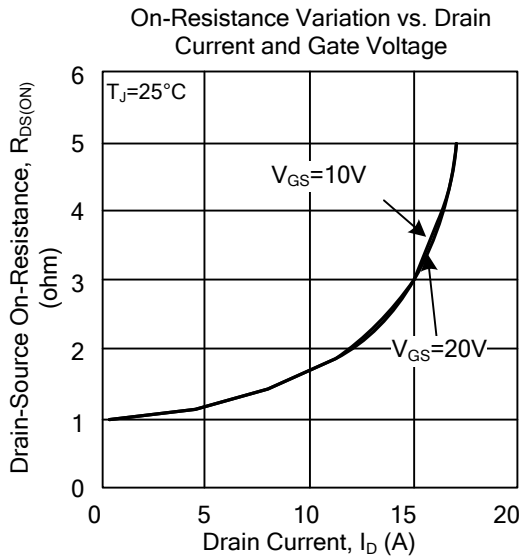
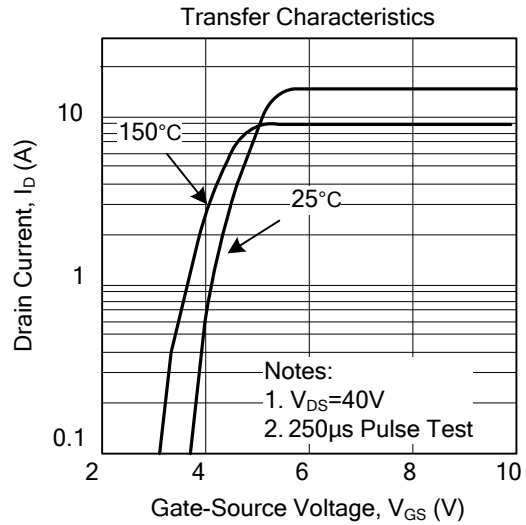
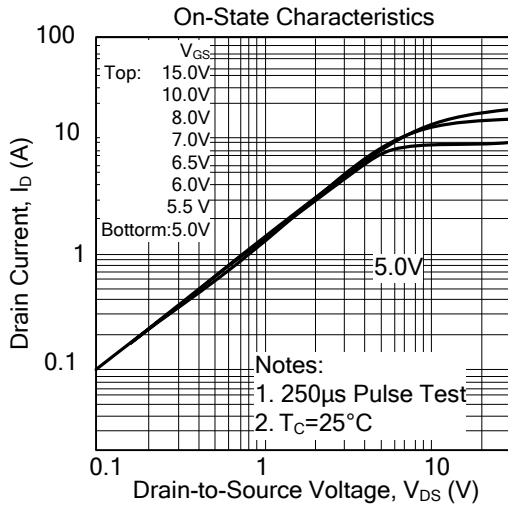


Unclamped Inductive Switching Test Circuit

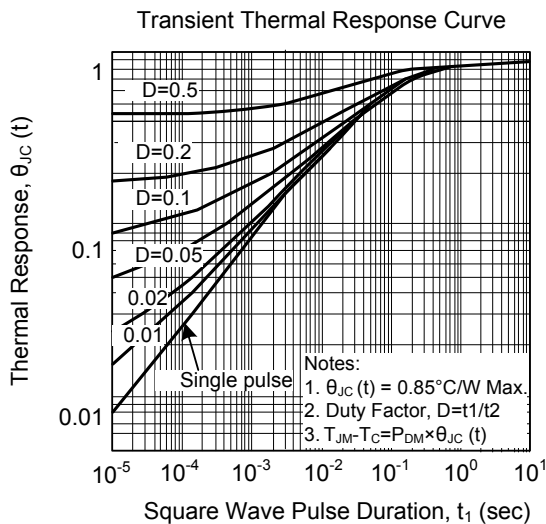
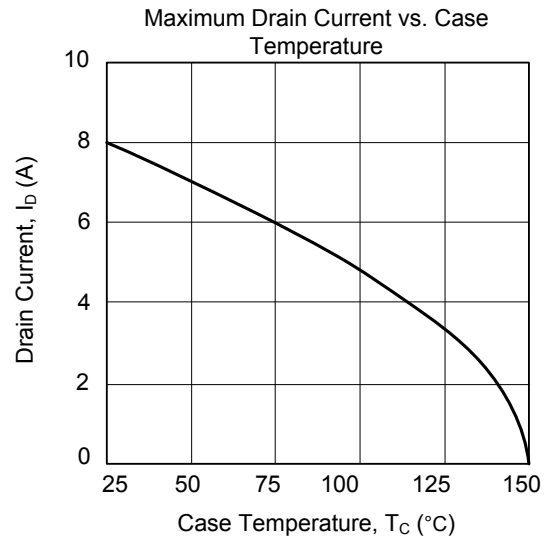
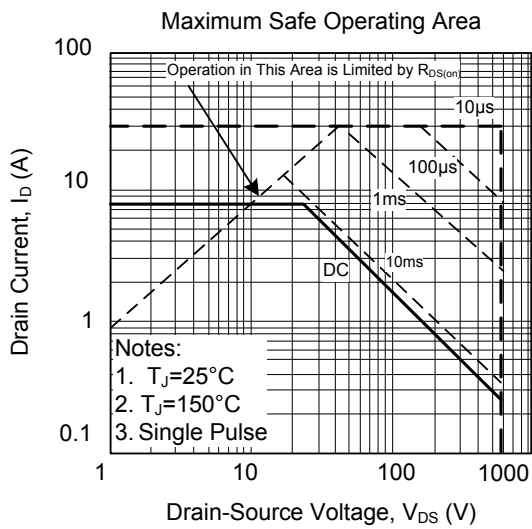
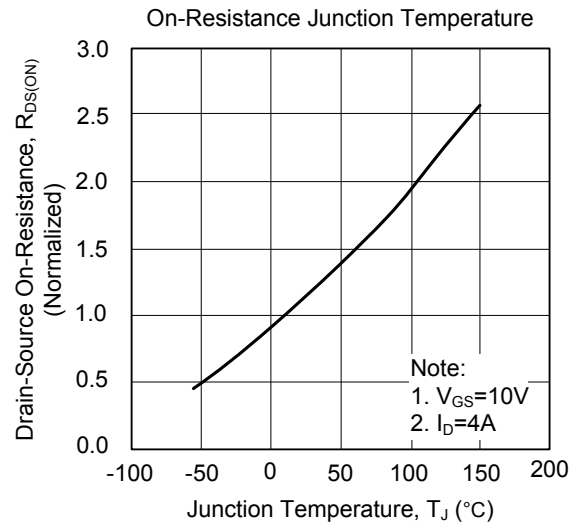
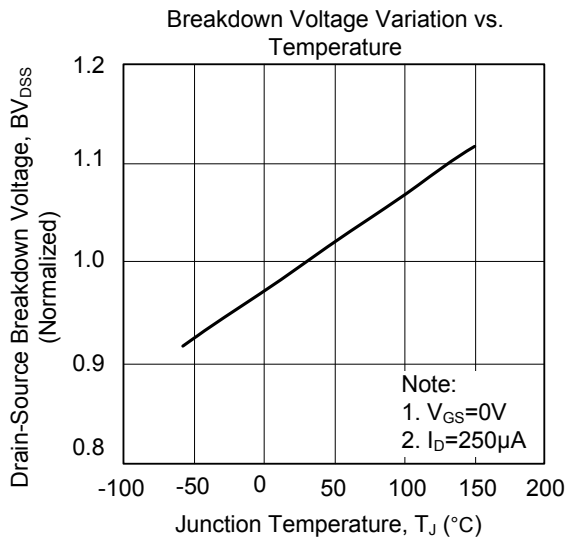


Unclamped Inductive Switching Waveforms

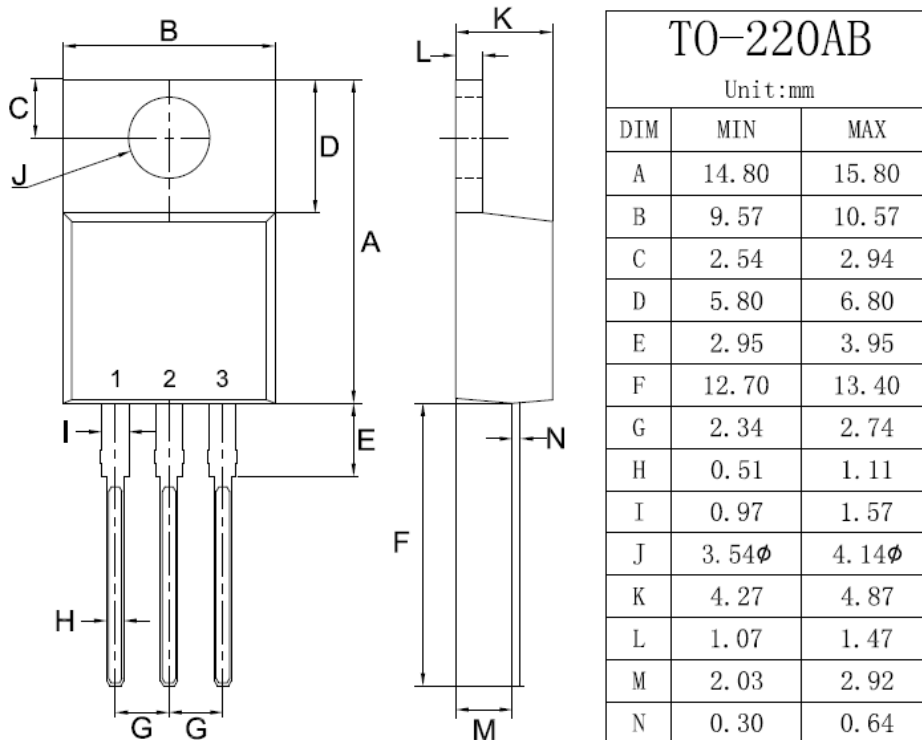
TYPICAL CHARACTERISTICS



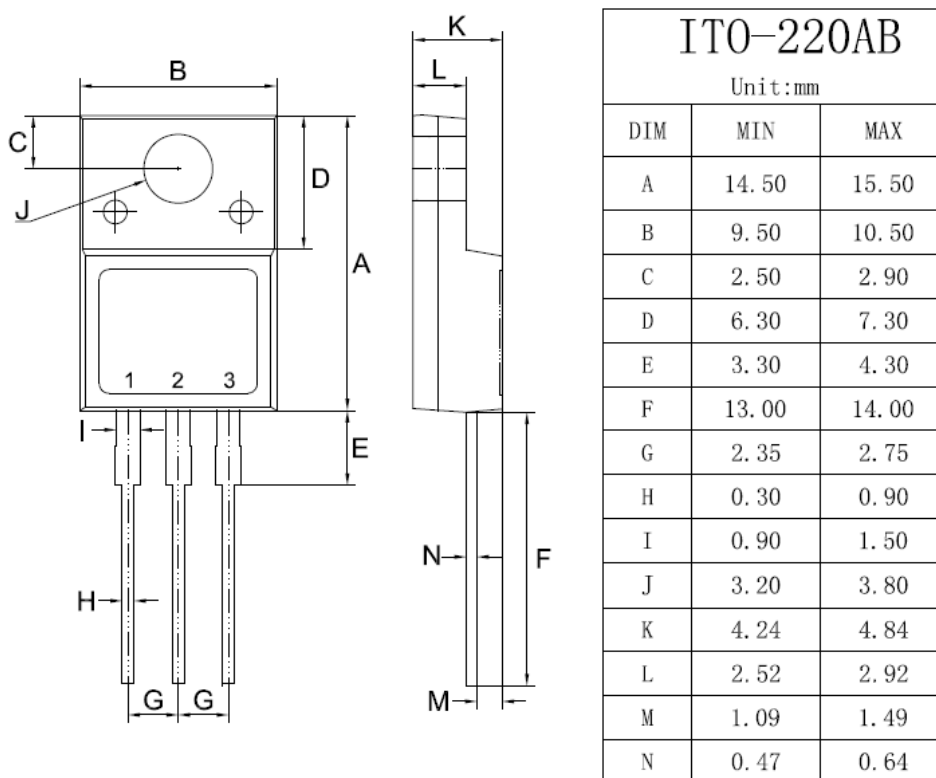
TYPICAL CHARACTERISTICS



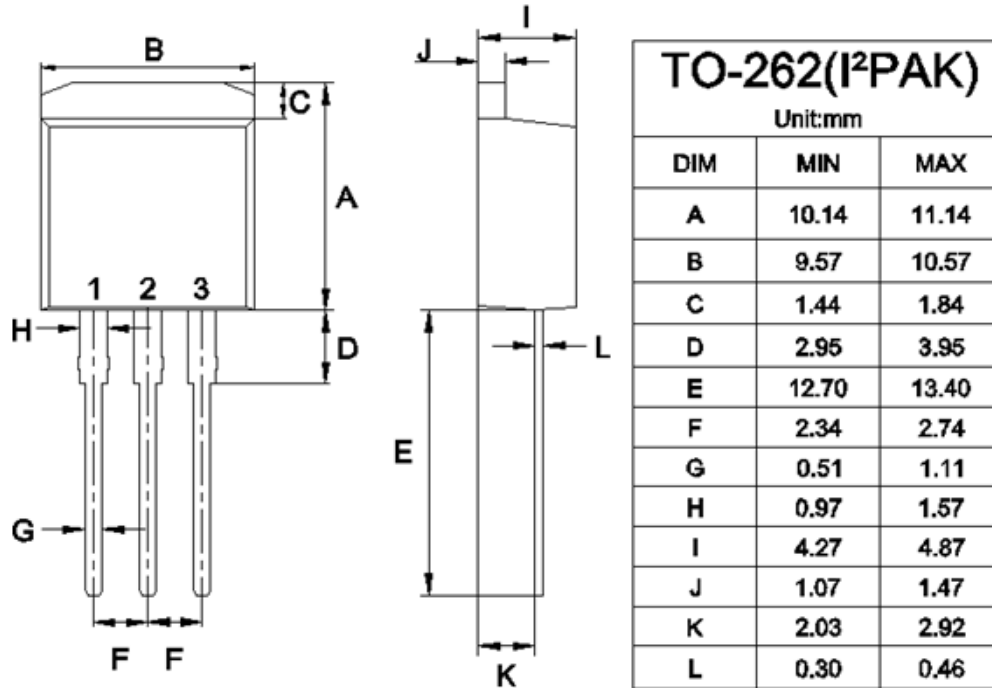
TO-220 Mechanical Drawing



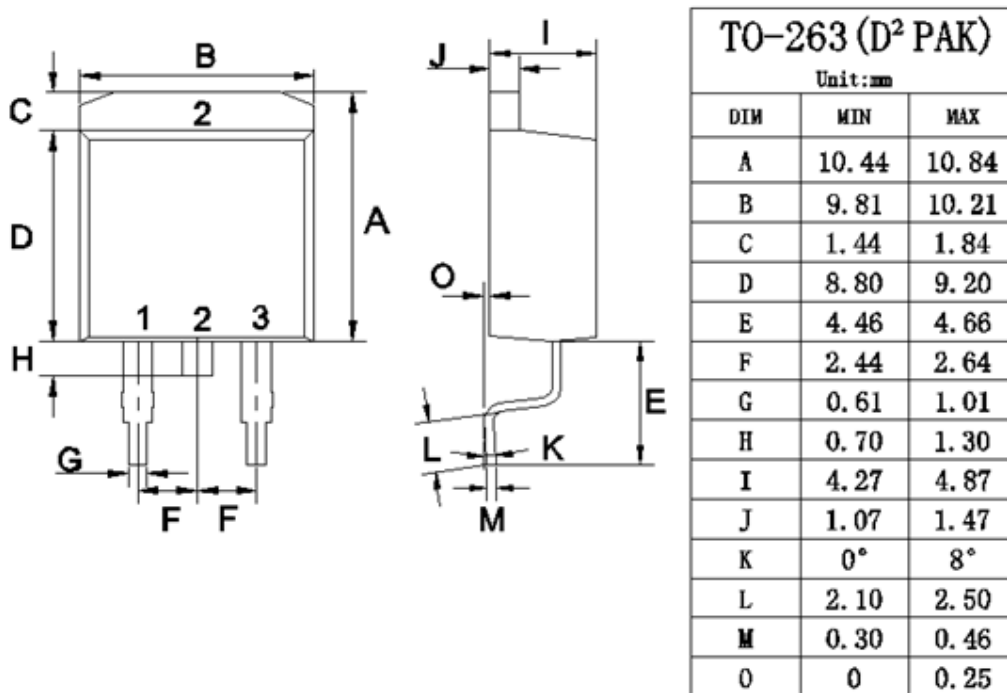
ITO-220 Mechanical Drawing



TO-262 Mechanical Drawing



TO-263 Mechanical Drawing



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