

**Features**

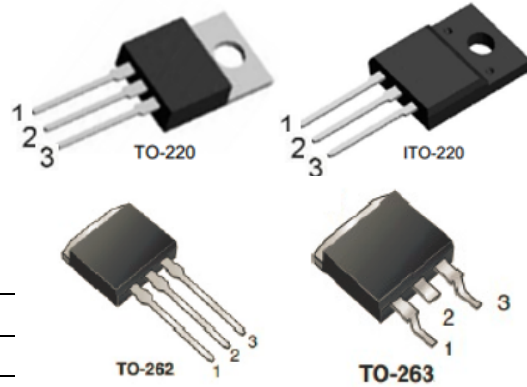
- $R_{DS(ON)} < 0.49\Omega @ V_{GS}=10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

**PRODUCT SUMMARY**

$V_{DS}$ (V)	$R_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
650	0.49@ $V_{GS}=10V$	16

Pin Definition:

1. Gate
2. Drain
3. Source



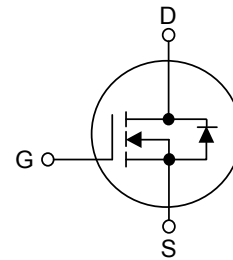
**Mechanical Data**

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

**Ordering Information**

Part No.	Package	Packing
DMT16N65-TU	TO-220	50pcs / Tube
DMF16N65-TU	ITO-220	50pcs / Tube
DMK16N65-TU	TO-262	50pcs / Tube
DMG16N65-TU	TO-263	50pcs / Tube
DMG16N65-TR	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	$V_{GSS}$	$\pm 30$	V	
Continuous Drain Current	$I_D$	16	A	
Pulsed Drain Current (Note 2)	$I_{DM}$	64	A	
Avalanche Energy	Single Pulsed (Note 3)	$E_{AS}$	790	mJ
Power Dissipation	TO-220/TO-262/TO-263	$P_D$	180	W
	ITO-220		70	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.  $L = 30mH, I_{AS} = 7.1A, V_{DD} = 50V, R_G = 25 \Omega$ , Starting  $T_J = 25^\circ C$

### THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ITO-220 TO-262/TO-263	$\theta_{JA}$	62.5	°C/W
Junction to Case	TO-220	$\theta_{JC}$	0.69	°C/W
	ITO-220		1.79	

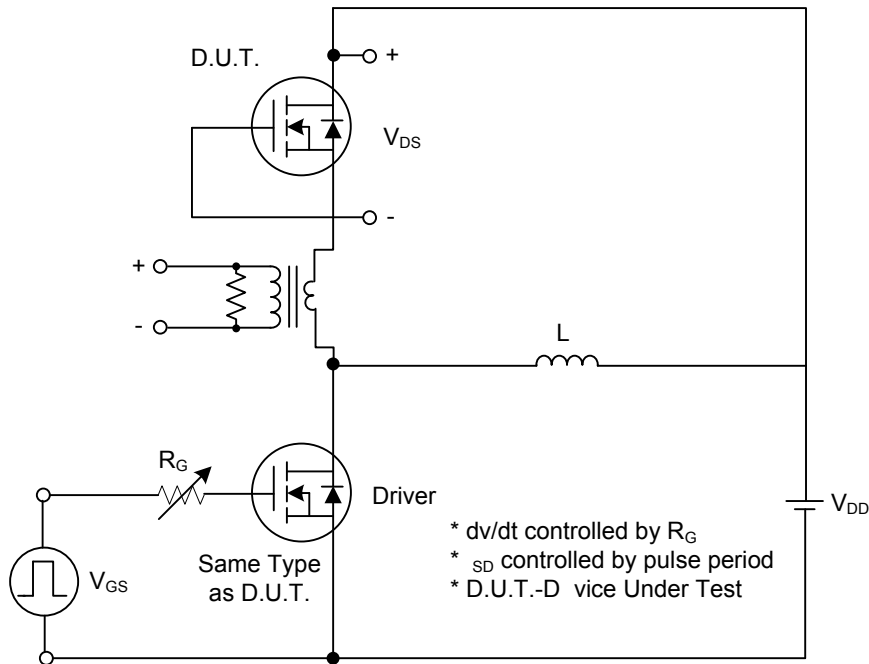
### ELECTRICAL CHARACTERISTICS (T<sub>C</sub>=25°C, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
<b>OFF CHARACTERISTICS</b>								
Drain-Source Breakdown Voltage		BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>D</sub> =250μA	650			V	
Drain-Source Leakage Current		I <sub>DSS</sub>	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V			1	μA	
Gate- Source Leakage Current	Forward	I <sub>GSS</sub>	V <sub>GS</sub> =30V, V <sub>DS</sub> =0V			100	nA	
	Reverse		V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V			-100	nA	
<b>ON CHARACTERISTICS</b>								
Gate Threshold Voltage		V <sub>GS(TH)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =250μA	2.0		4.0	V	
Static Drain-Source On-State Resistance		R <sub>DS(ON)</sub>	V <sub>GS</sub> =10V, I <sub>D</sub> =8A		0.49	0.55	Ω	
<b>DYNAMIC CHARACTERISTICS</b>								
Input Capacitance		C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, f=1.0 MHz		2450		pF	
Output Capacitance		C <sub>OSS</sub>				218		pF
Reverse Transfer Capacitance		C <sub>RSS</sub>				18		pF
<b>SWITCHING CHARACTERISTICS</b>								
Turn-On Delay Time		t <sub>D(ON)</sub>	V <sub>DD</sub> =300V, I <sub>D</sub> =16A, R <sub>G</sub> =25Ω (Note 1, 2)		30		ns	
Turn-On Rise Time		t <sub>R</sub>				70		ns
Turn-Off Delay Time		t <sub>D(OFF)</sub>				145		ns
Turn-Off Fall Time		t <sub>F</sub>				75		ns
Total Gate Charge		Q <sub>G</sub>	V <sub>DS</sub> =480V, I <sub>D</sub> =16A, V <sub>GS</sub> =10V (Note 1, 2)		64		nC	
Gate-Source Charge		Q <sub>GS</sub>				10		nC
Gate-Drain Charge		Q <sub>GD</sub>				29		nC
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>								
Drain-Source Diode Forward Voltage		V <sub>SD</sub>	V <sub>GS</sub> = 0 V, I <sub>S</sub> = 16A			1.5	V	
Maximum Continuous Drain-Source Diode Forward Current		I <sub>S</sub>				16	A	
Maximum Pulsed Drain-Source Diode Forward Current		I <sub>SM</sub>				64	A	
Reverse Recovery Time		t <sub>rr</sub>	V <sub>GS</sub> =0V, I <sub>S</sub> =16A, dI <sub>F</sub> /dt =100 A/μs (Note 1)		483		ns	
Reverse Recovery Charge		Q <sub>RR</sub>				8.9		μC

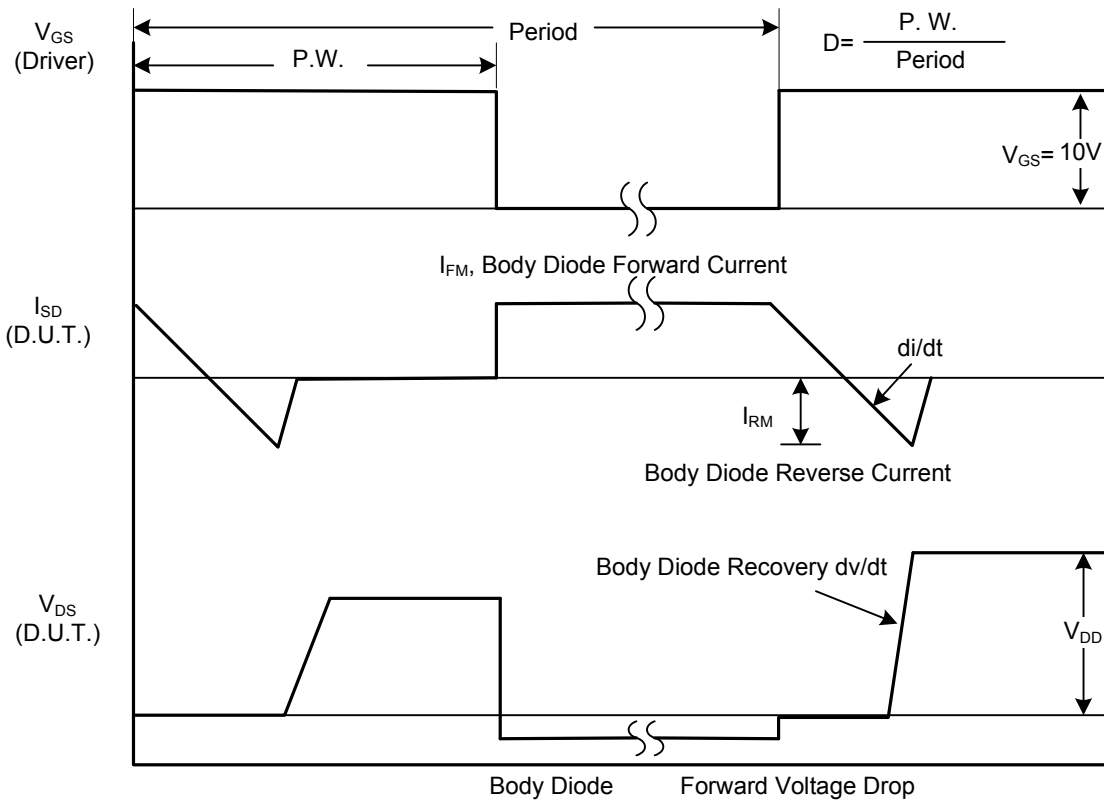
Notes: 1. Pulse Test: Pulse width ≤ 300μs, Duty cycle ≤ 2%.

2. Essentially independent of operating temperature.

### TEST CIRCUITS AND WAVEFORMS

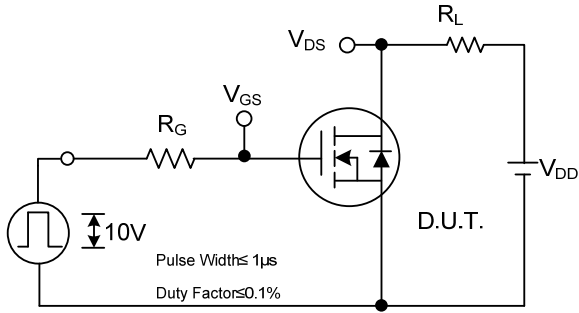


**Peak Diode Recovery  $dv/dt$  Test Circuit**

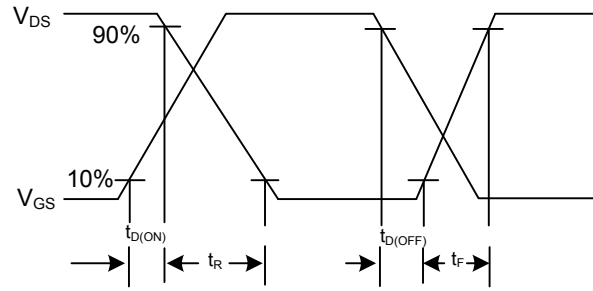


**Peak Diode Recovery  $dv/dt$  Waveforms**

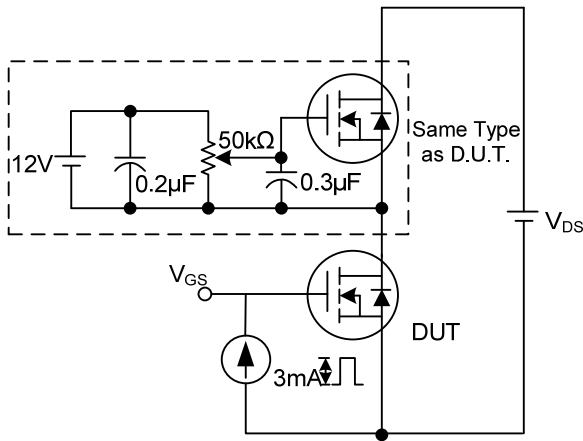
### TEST CIRCUITS AND WAVEFORMS(Cont.)



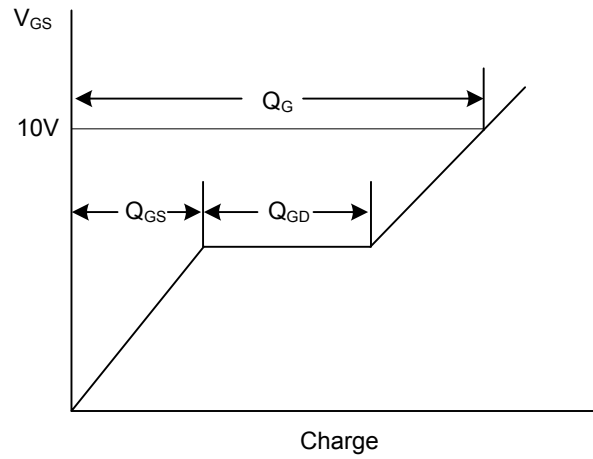
Switching Test Circuit



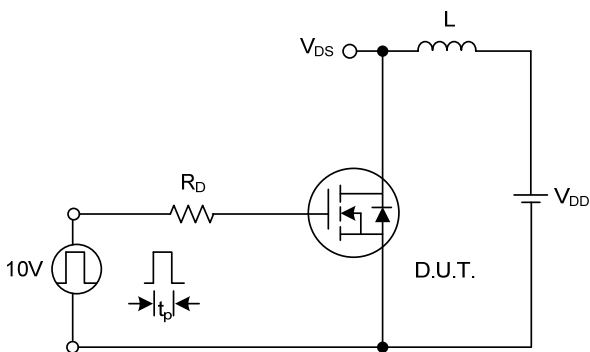
Switching Waveforms



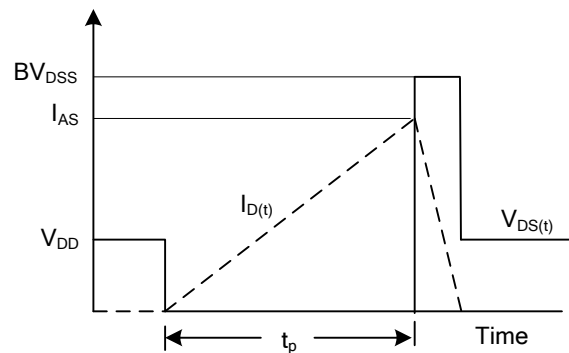
Gate Charge Test Circuit



Gate Charge Waveform

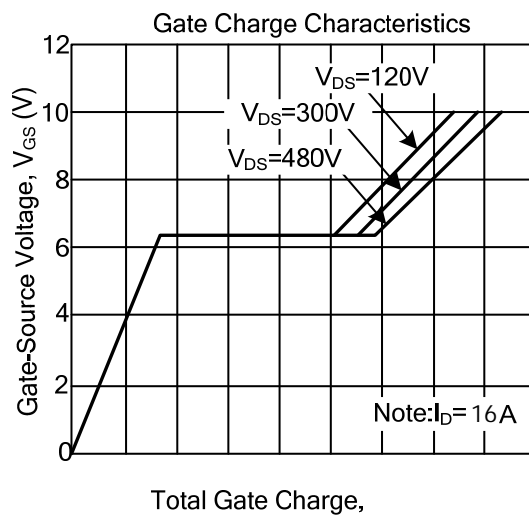
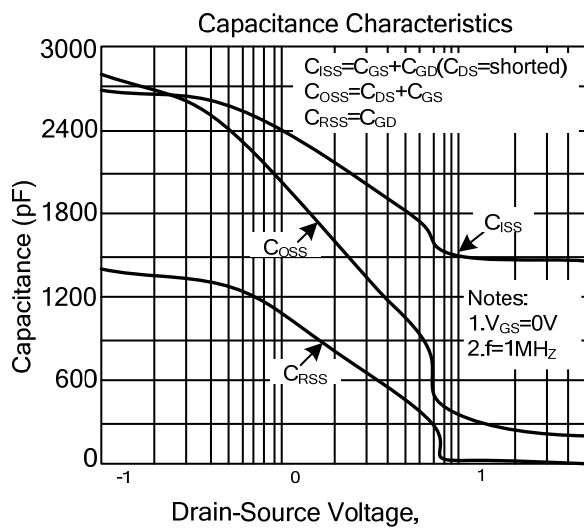
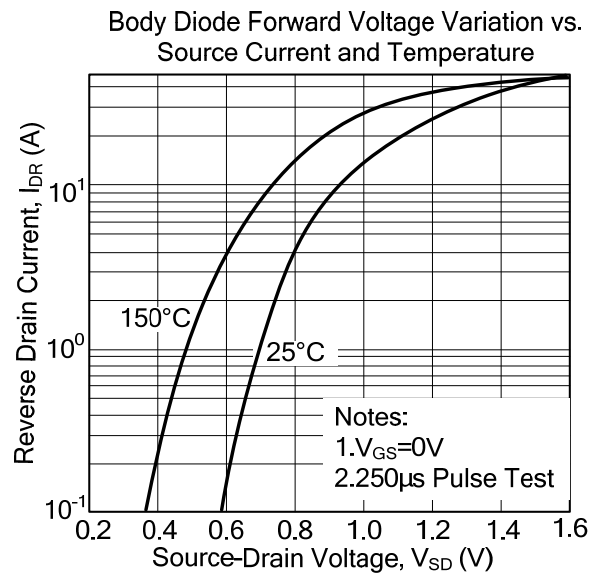
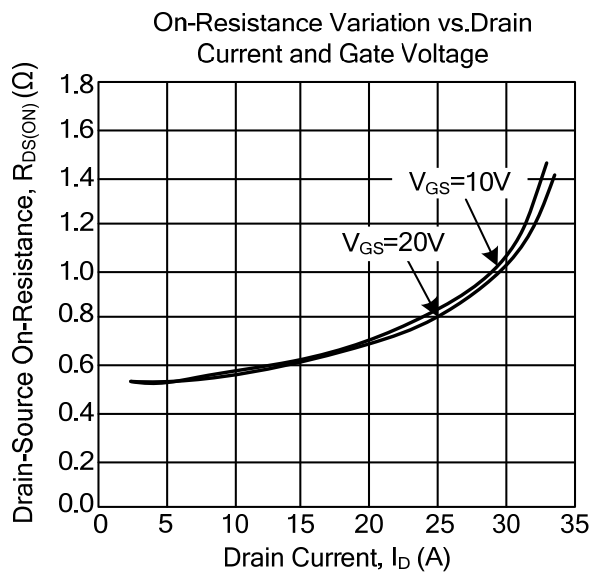
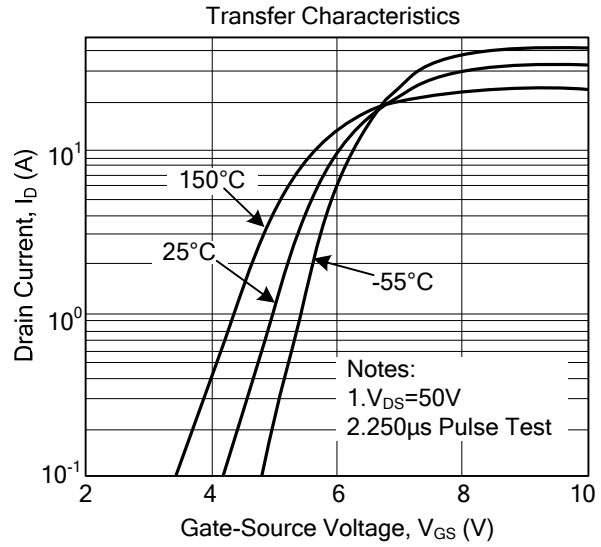
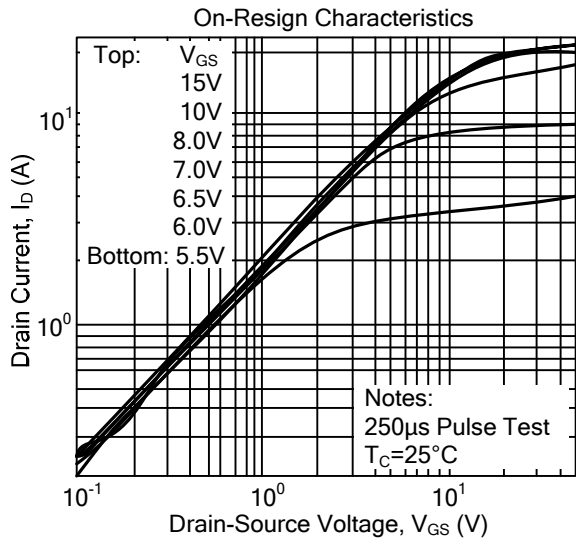


Unclamped Inductive Switching Test Circuit

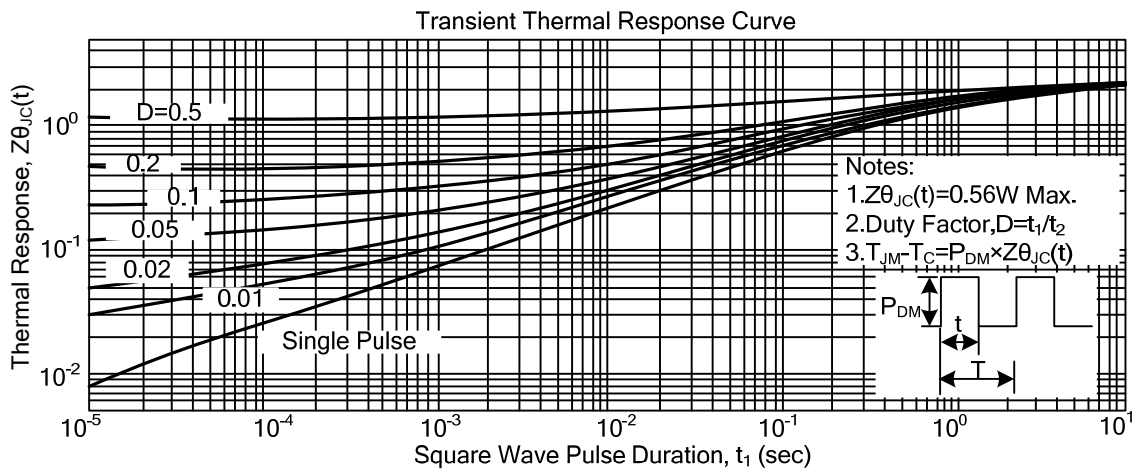
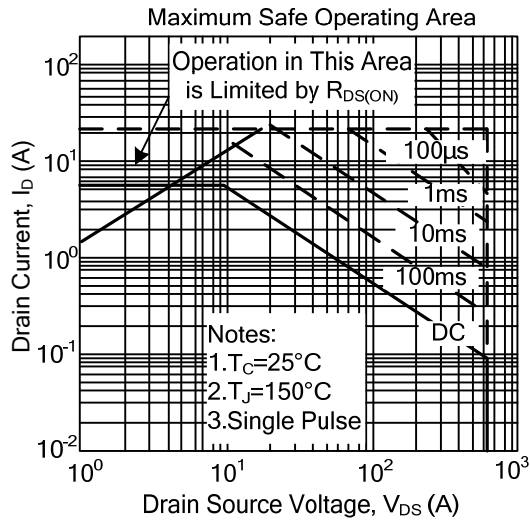


Unclamped Inductive Switching Waveforms

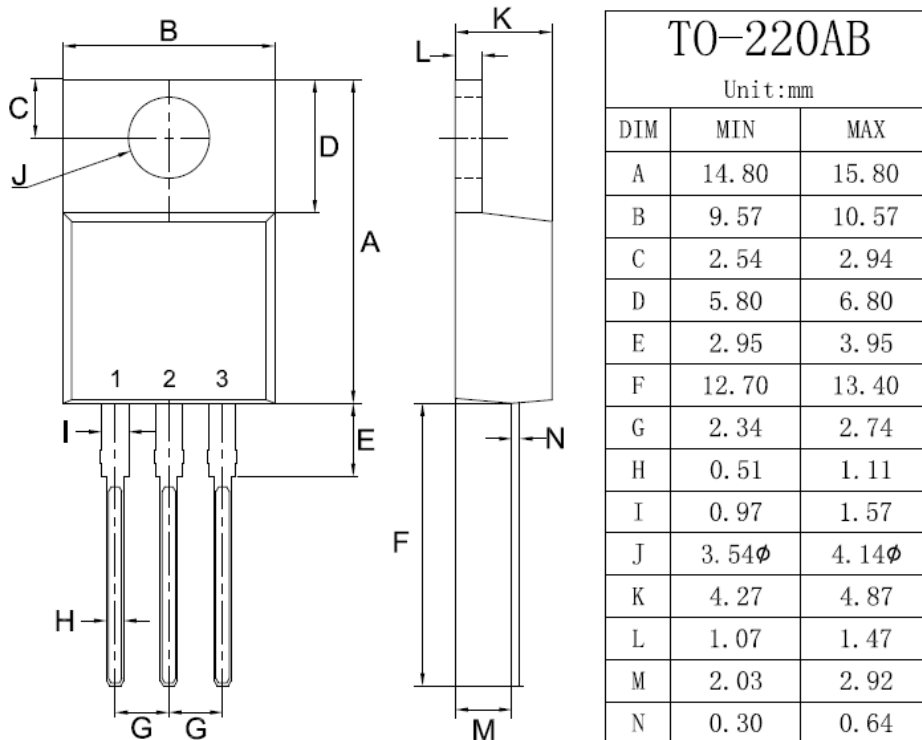
### TYPICAL CHARACTERISTICS



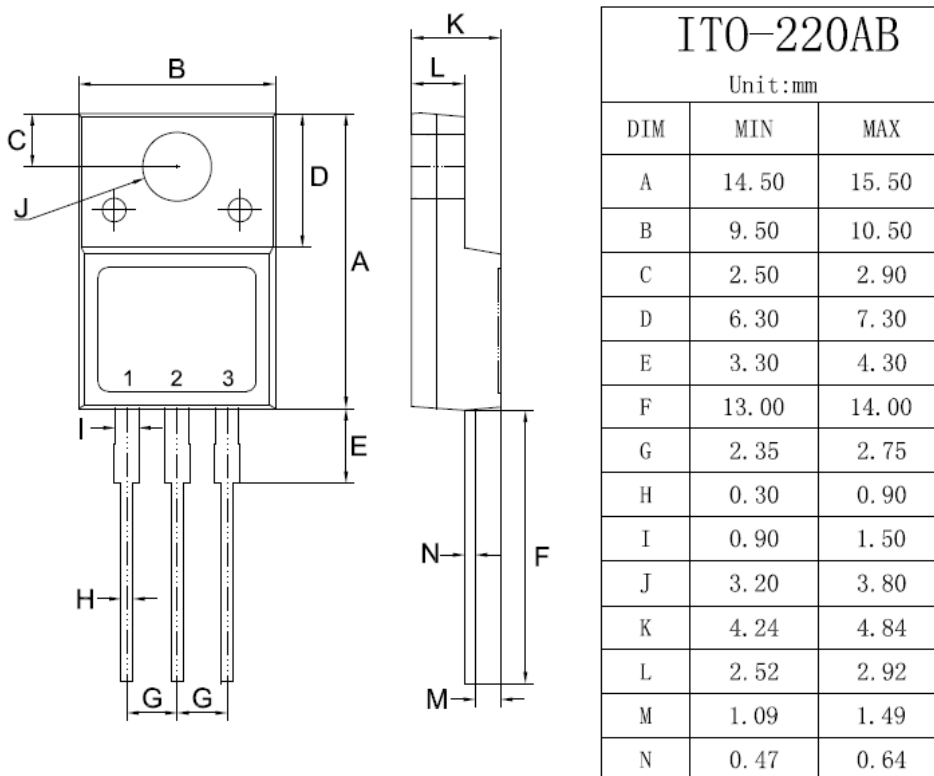
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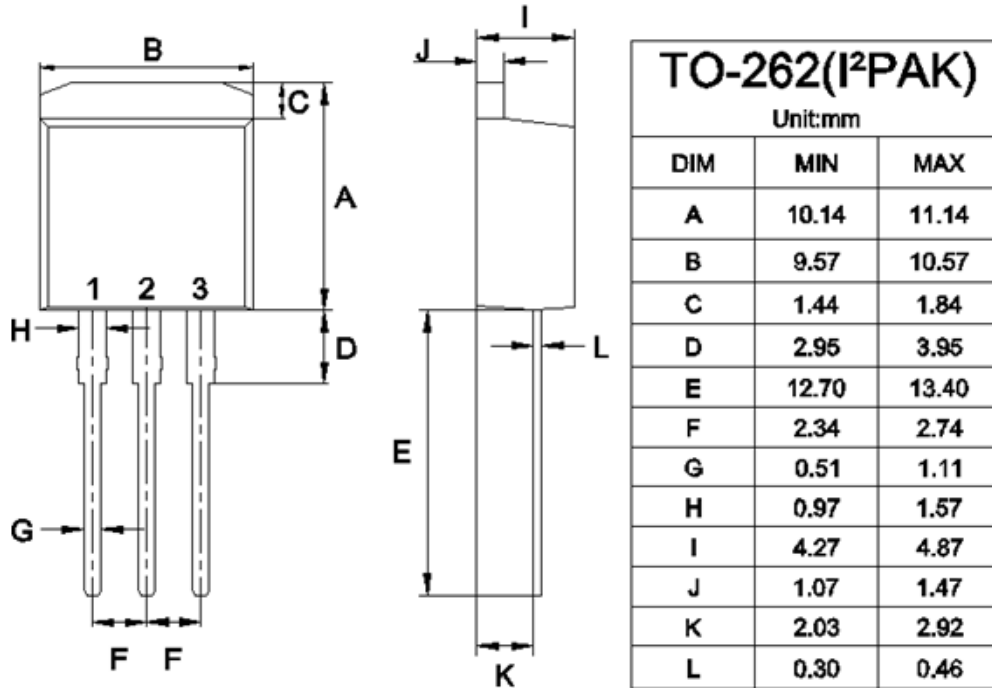
### TO-220 Mechanical Drawing



### ITO-220 Mechanical Drawing



### TO-262 Mechanical Drawing



### TO-263 Mechanical Drawing

