



10N60

600V N-Channel Power MOSFET

Features

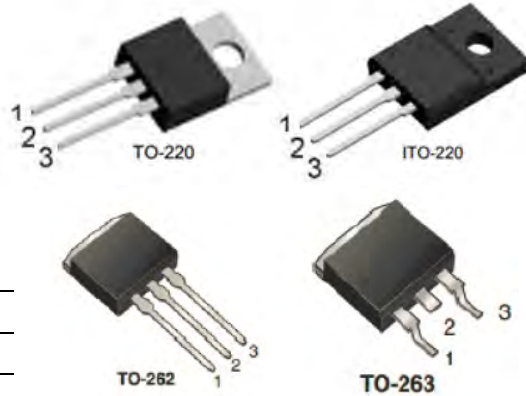
- $R_{DS(ON)} < 0.9\Omega$ @ $V_{GS} = 10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
600	0.9 @ $V_{GS} = 10V$	10

Pin Definition:

1. Gate
2. Drain
3. Source



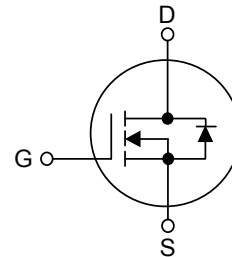
Mechanical Data

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

Ordering Information

Part No.	Package	Packing
DMT10N60-TU	TO-220	50pcs / Tube
DMF10N60-TU	ITO-220	50pcs / Tube
DMK10N60-TU	TO-262	50pcs / Tube
DMG10N60-TU	TO-263	50pcs / Tube
DMG10N60-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}	600	V	
Gate-Source Voltage	V_{GSS}	± 30	V	
Continuous Drain Current	I_D	10	A	
Pulsed Drain Current (Note 2)	I_{DM}	38	A	
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	700	mJ
Power Dissipation	TO-220/TO-262/TO-263	P_D	156	W
	ITO-220		50	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. $L = 30mH$, $I_{AS} = 6.4A$, $V_{DD} = 50V$, $R_G = 25\Omega$, 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	$^{\circ}\text{C}/\text{W}$
Junction to Case	TO-220	θ_{JC}	0.85	$^{\circ}\text{C}/\text{W}$
	ITO-220		2.6	

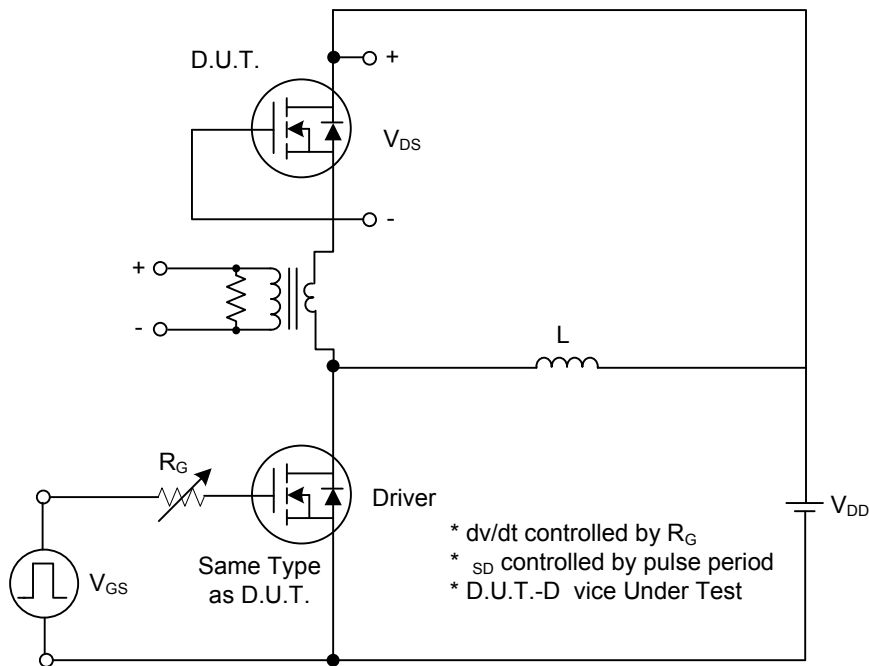
ELECTRICAL CHARACTERISTICS ($T_C=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
OFF CHARACTERISTICS								
Drain-Source Breakdown Voltage		BV_{DSS}	$V_{GS}=0\text{V}, I_D=250\mu\text{A}$	600			V	
Drain-Source Leakage Current		I_{DSS}	$V_{DS}=600\text{V}, V_{GS}=0\text{V}$			1	μA	
Gate- Source Leakage Current	Forward	I_{GSS}	$V_{GS}=30\text{V}, V_{DS}=0\text{V}$			100	nA	
	Reverse		$V_{GS}=-30\text{V}, V_{DS}=0\text{V}$			-100	nA	
ON CHARACTERISTICS								
Gate Threshold Voltage		$V_{GS(TH)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2.0		4.0	V	
Static Drain-Source On-State Resistance		$R_{DS(ON)}$	$X_{\theta S}=10\text{V}, I_D=5\text{A}$		0.76	0.9	Ω	
DYNAMIC CHARACTERISTICS								
Input Capacitance		C_{ISS}	$V_{DS}=25\text{V}, V_{GS}=0\text{V}, f=1.0\text{ MHz}$		1570		pF	
Output Capacitance		C_{OSS}				166		pF
Reverse Transfer Capacitance		C_{RSS}				18		pF
SWITCHING CHARACTERISTICS								
Turn-On Delay Time		$t_{D(ON)}$	$V_{DD}=300\text{V}, I_D=10\text{A}, R_G=25\Omega$ (Note 1, 2)		23		ns	
Turn-On Rise Time		t_R				69		ns
Turn-Off Delay Time		$t_{D(OFF)}$				144		ns
Turn-Off Fall Time		t_F				77		ns
Total Gate Charge		Q_G	$V_{DS}=480\text{V}, I_D=10\text{A}, V_{GS}=10\text{V}$ (Note 1, 2)		44		nC	
Gate-Source Charge		Q_{GS}				6.7		nC
Gate-Drain Charge		Q_{GD}				18.5		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS								
Drain-Source Diode Forward Voltage		V_{SD}	$V_{GS}=0\text{V}, I_S=10\text{A}$			1.4	V	
Maximum Continuous Drain-Source Diode Forward Current		I_S				10	A	
Maximum Pulsed Drain-Source Diode Forward Current		I_{SM}				40	A	
Reverse Recovery Time		t_{rr}	$V_{GS}=0\text{V}, I_S=10\text{A}, dI_F/dt=100\text{ A}/\mu\text{s}$ (Note 1)		450		ns	
Reverse Recovery Charge		Q_{RR}			4.2		μC	

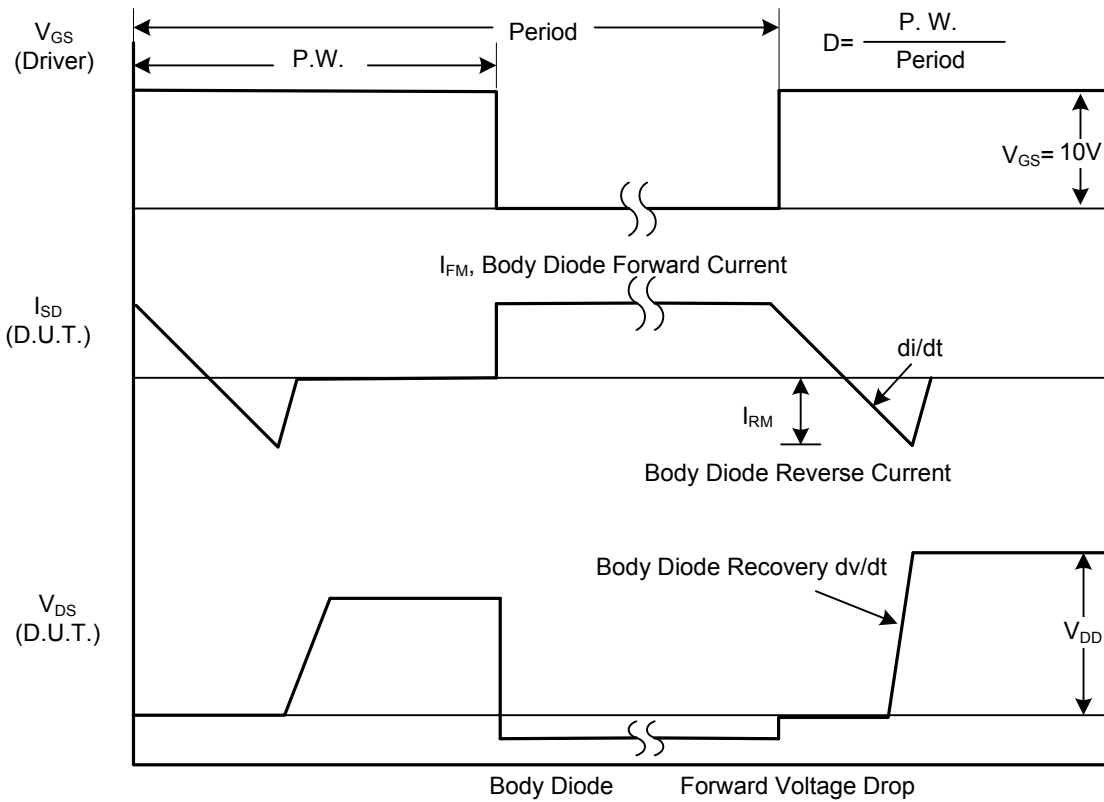
Notes: 1. Pulse Test: Pulse width $\leq 300\mu\text{s}$, Duty cycle $\leq 2\%$.
 2. Essentially independent of operating temperature.



TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



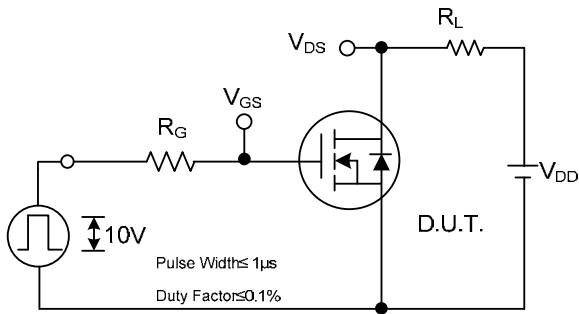
Peak Diode Recovery dv/dt Waveforms



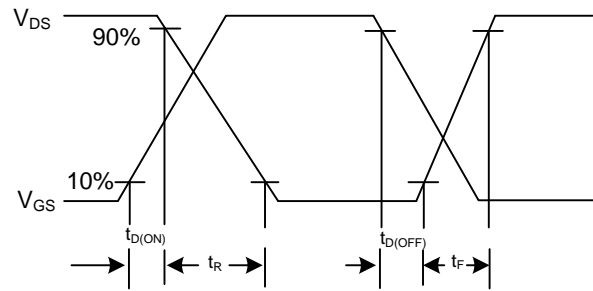
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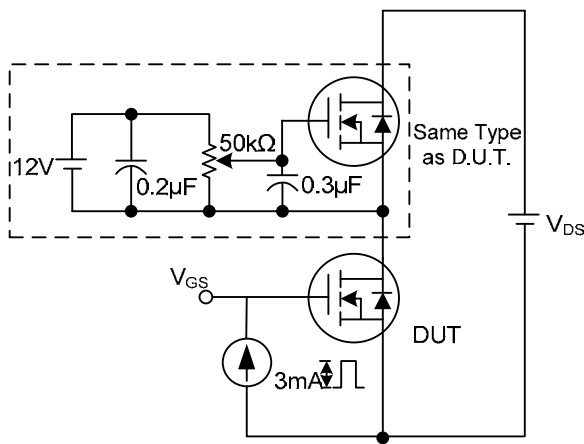
TEST CIRCUITS AND WAVEFORMS(Cont.)



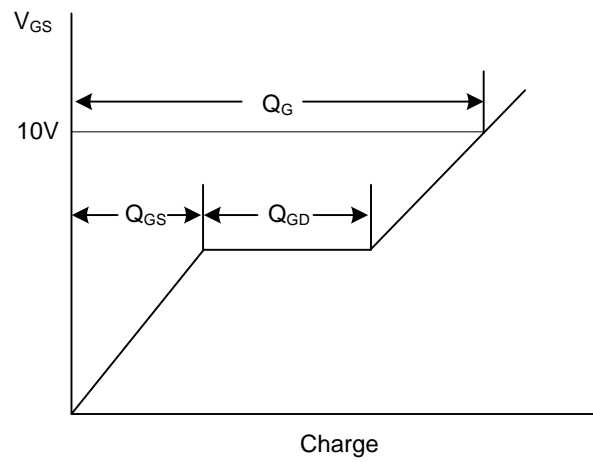
Switching Test Circuit



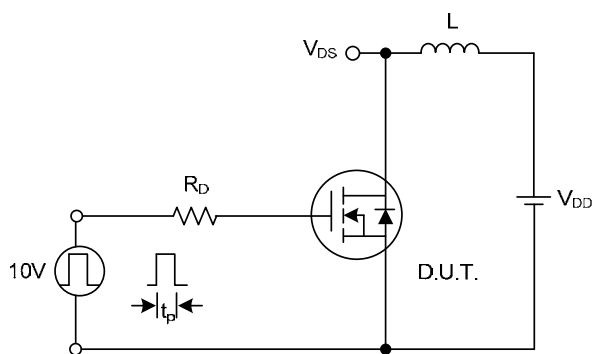
Switching Waveforms



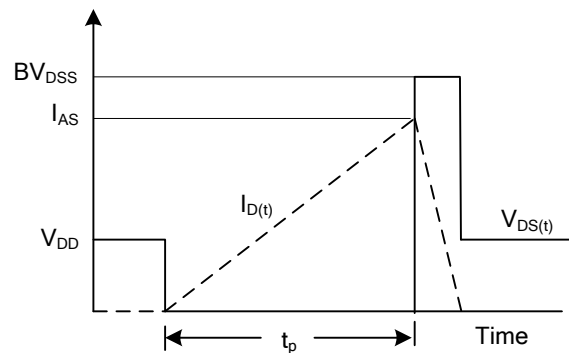
Gate Charge Test Circuit



Gate Charge Waveform



Unclamped Inductive Switching Test Circuit

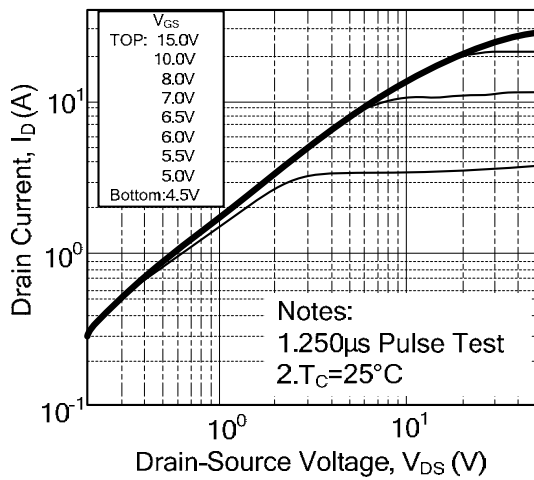


Unclamped Inductive Switching Waveforms

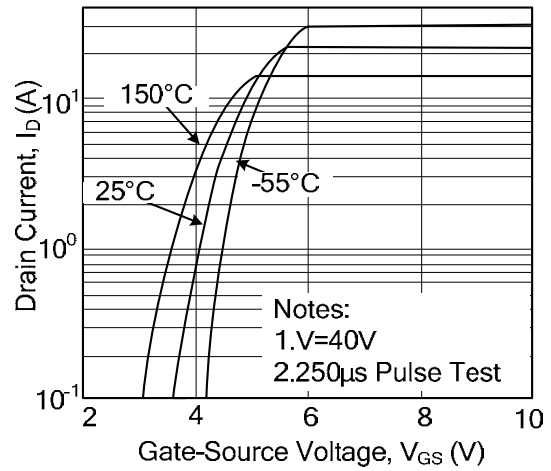


TYPICAL CHARACTERISTICS

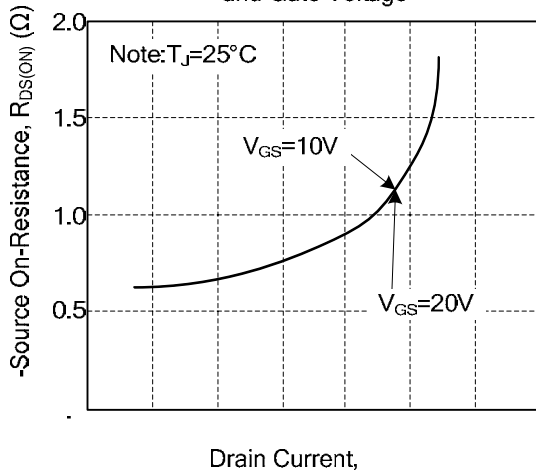
On-Region Characteristics



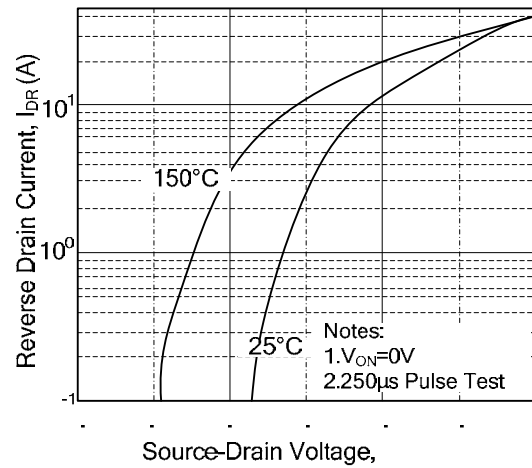
Transfer Characteristics



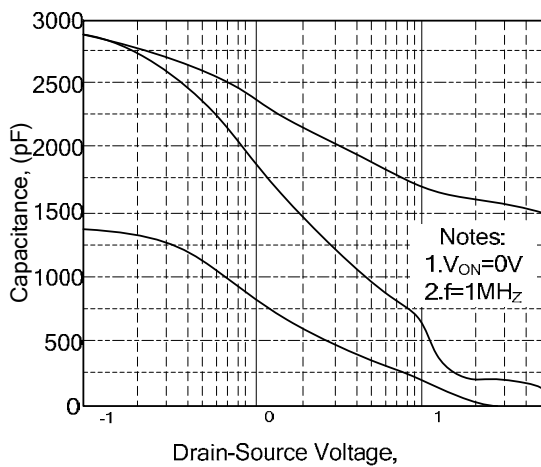
On-Resistance Variation vs. Drain Current and Gate Voltage



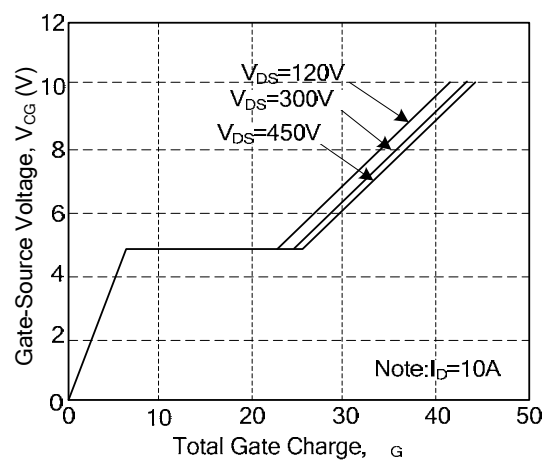
Body Diode Forward Voltage Variation with Source Current and Temperature



Capacitance Characteristics

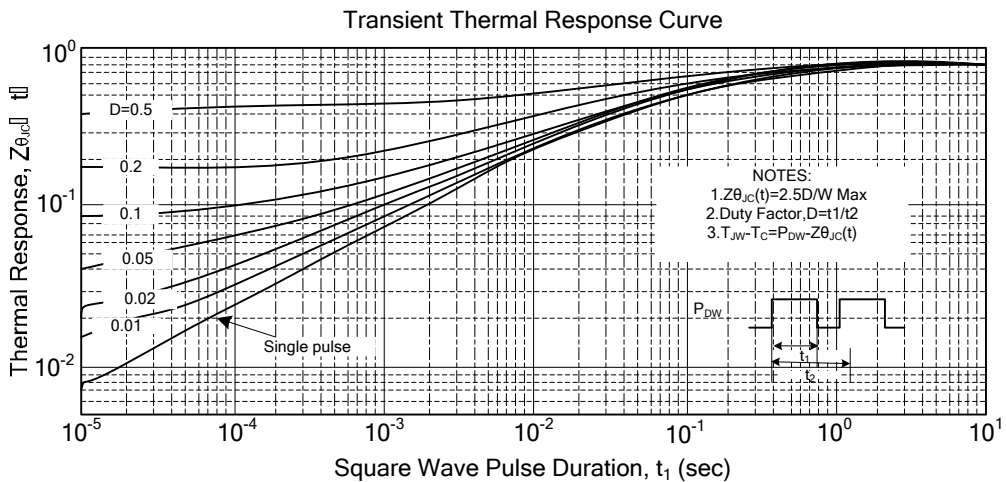
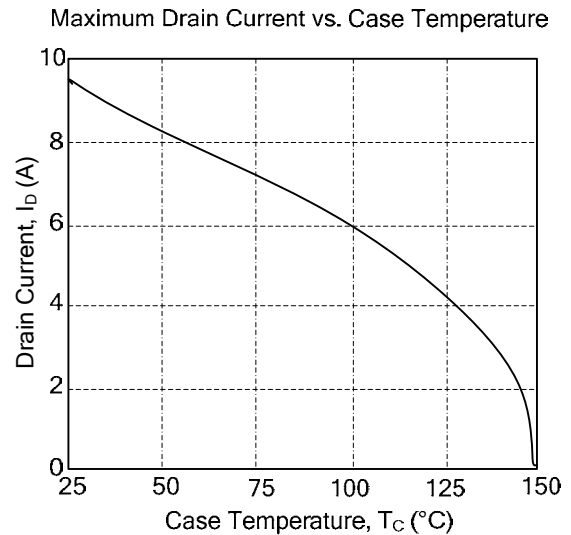
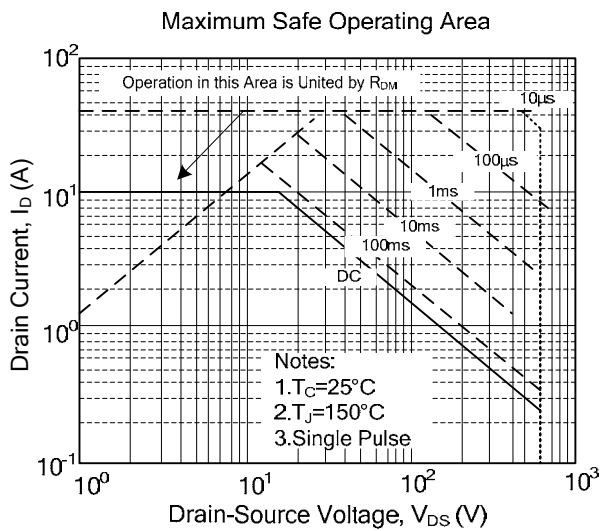
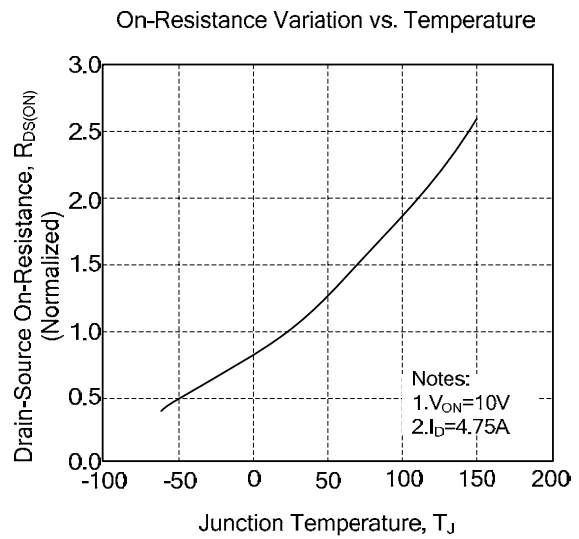
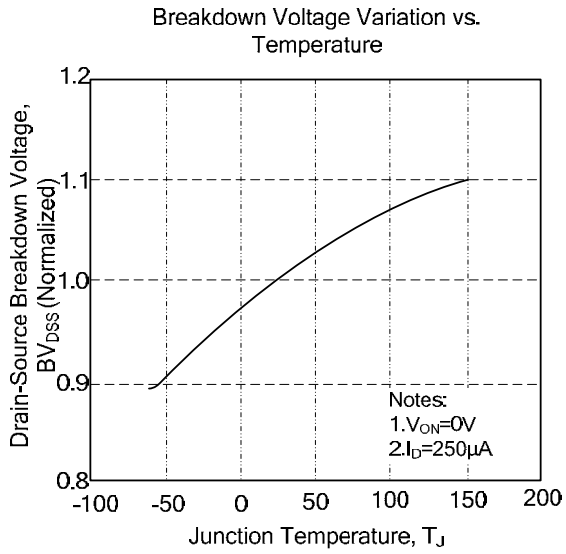


Gate Charge Characteristics



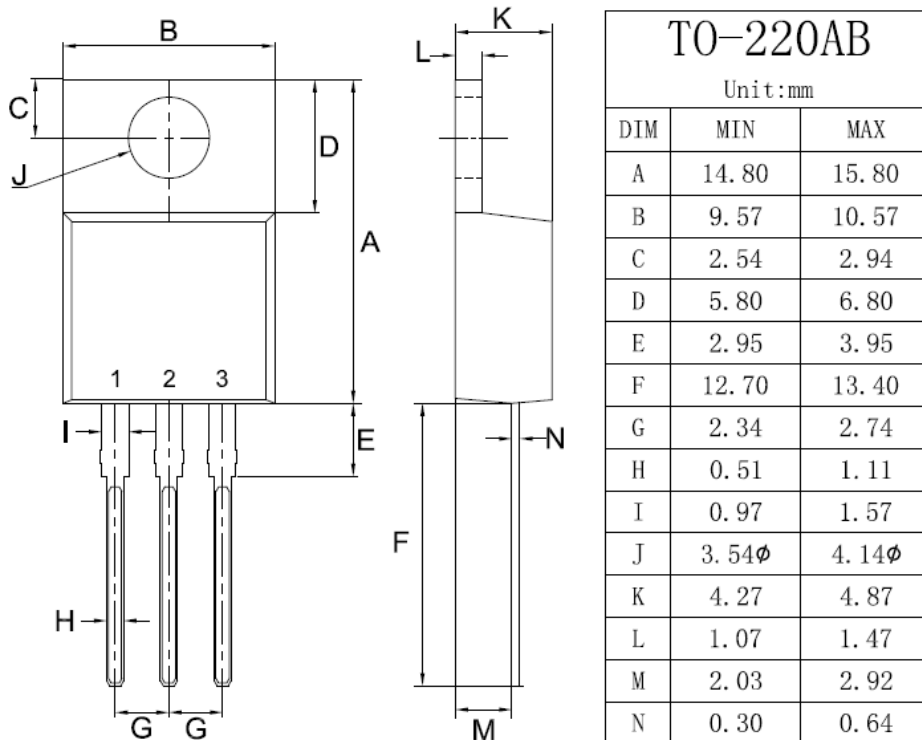


TYPICAL CHARACTERISTICS

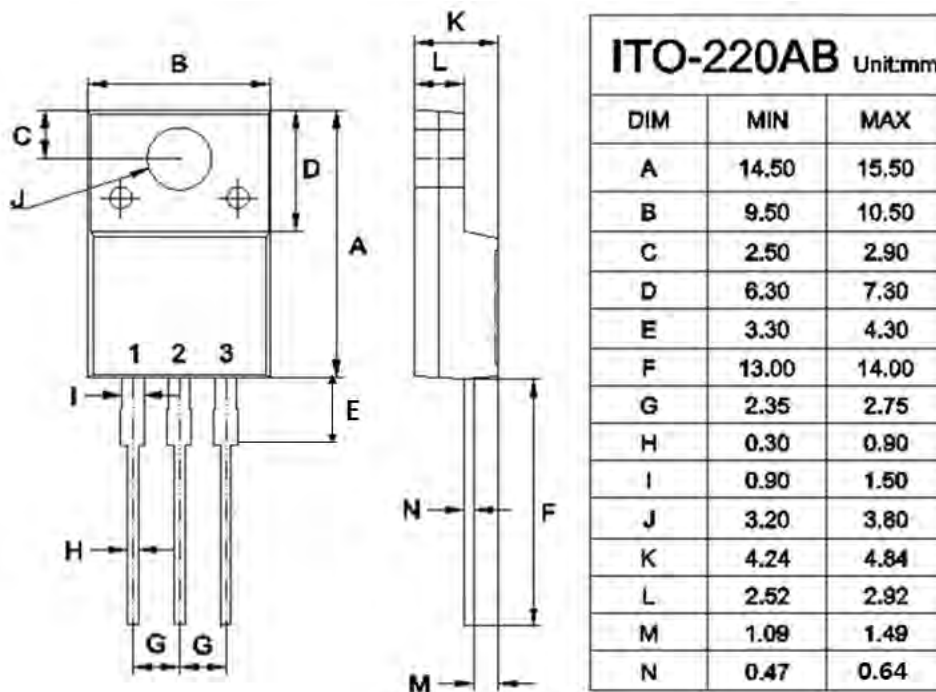




TO-220 Mechanical Drawing

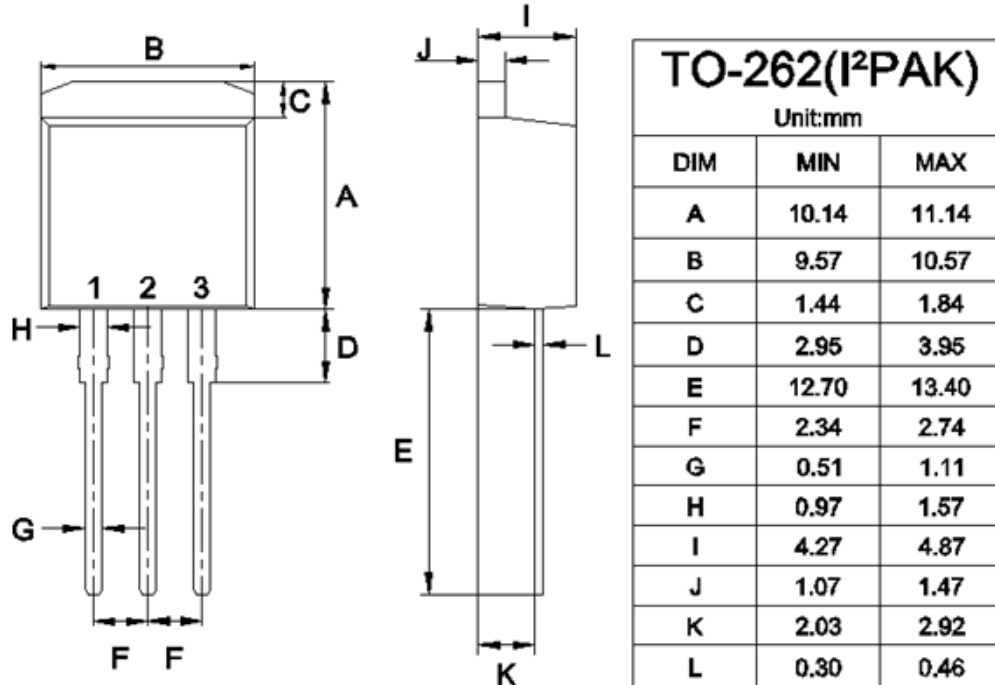


ITO-220 Mechanical Drawing





TO-262 Mechanical Drawing



TO-263 Mechanical Drawing

