



6N60

600V N-Channel Power MOSFET

Features

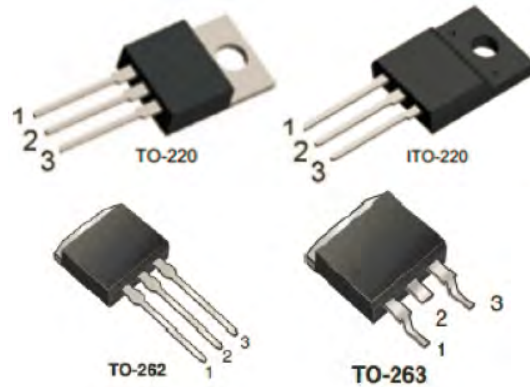
- $R_{DS(ON)} < 1.5\Omega$ @ $V_{GS} = 10V$
- Fast switching capability
- Low gate charge
- Lead free in compliance with EU RoHS directive.
- Green molding compound

Mechanical Data

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

PRODUCT SUMMARY

V_{DS} (V)	Current(A)	$R_{DS(on)}$ (Ω)
600	6	1.5 @ $V_{GS} = 10V$



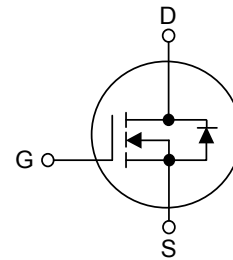
Pin Definition:

1. Gate
2. Drain
3. Source

Ordering Information

Part No.	Package	Packing
DMT6N60-TU	TO-220	50pcs / Tube
DMF6N60-TU	ITO-220	50pcs / Tube
DMK6N60-TU	TO-262	50pcs / Tube
DMG6N60-TU	TO-263	50pcs / Tube
DMG6N60-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
Avalanche Current (Note 2)		I_{AR}	6	A
Continuous Drain Current		I_D	6	A
Pulsed Drain Current (Note 2)		I_{DM}	24.8	A
Avalanche Energy	Single Pulsed (Note 3)	E_{AS}	440	mJ
Peak Diode Recovery dv/dt (Note 4)		dv/dt	4.5	ns
Power Dissipation	TO-220/TO-262/TO-263	P_D	125	W
	ITO-220		42	W
	TO-251/TO-252		55	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. $L = 25mH$, $I_{AS} = 6A$, $V_{DD} = 90V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$

4. $I_{SD} \leq 6.2A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ C$



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THERMAL DATA

PARAMETER		SYMBOL	RATING	UNIT
Junction to Ambient	TO-220/ITO-220 TO-262 /TO-263	θ_{JA}	62.5	°C/W
Junction to Case	TO-220 TO-262/TO-263	θ_{JC}	1.2	°C/W
	ITO-220		3.5	

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

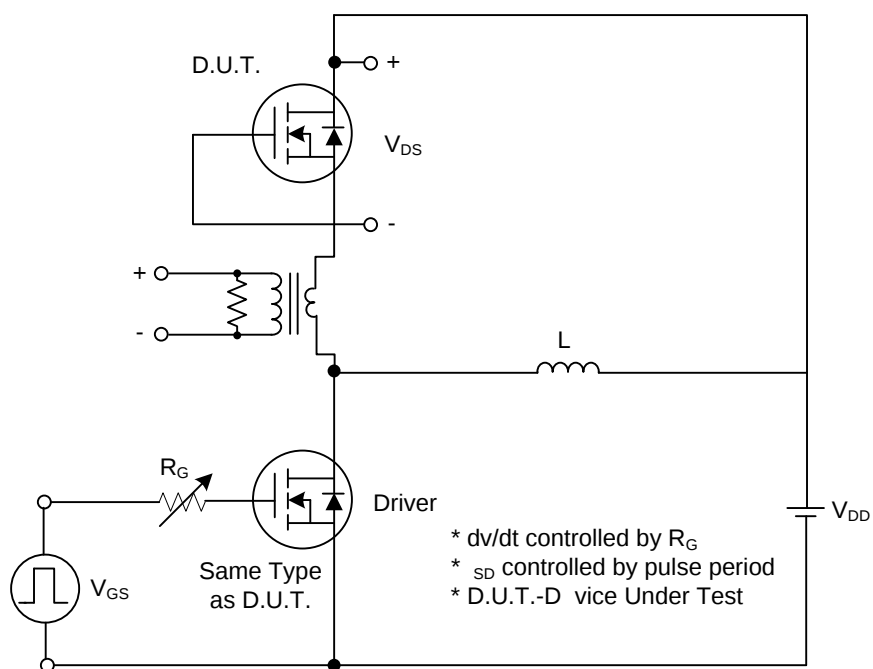
PARAMETER		SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS							
Drain-Source Breakdown Voltage		BV _{DSS}	V _{GS} =0V, I _D =250μA	600			V
Drain-Source Leakage Current		I _{DSS}	V _{DS} =600V, V _{GS} =0V			10	μA
			V _{DS} =480V, V _{GS} =0V, T _J =125°C			10	μA
Gate- Source Leakage Current	Forward	I _{GSS}	V _G =30V, V _{DS} =0V			100	nA
	Reverse		V _{GS} =-30V, V _{DS} =0V			-100	nA
Breakdown Voltage Temperature Coefficient		ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25°C		0.53		V/°C
ON CHARACTERISTICS							
Gate Threshold Voltage		V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	2.0		4.0	V
Static Drain-Source On-State Resistance		R _{DS(ON)}	V _{GS} =10V, I _D =3.1A		1.0	1.5	Ω
DYNAMIC CHARACTERISTICS							
Input Capacitance		C _{ISS}	V _{DS} =25V, V _{GS} =0V, f=1.0 MHz		770	1000	pF
Output Capacitance		C _{OSS}			95	120	pF
Reverse Transfer Capacitance		C _{RSS}			10	13	pF
SWITCHING CHARACTERISTICS							
Turn-On Delay Time		t _{D(ON)}	V _{DD} =300V, I _D =6.2A, R _G =25Ω (Note 1, 2)		40	50	ns
Turn-On Rise Time		t _R			70	150	ns
Turn-Off Delay Time		t _{D(OFF)}			40	90	ns
Turn-Off Fall Time		t _F			80	100	ns
Total Gate Charge		Q _G	V _{DS} =480V, I _D =6.2A, V _{GS} =10V (Note 1, 2)		20	25	nC
Gate-Source Charge		Q _{GS}			4.9		nC
Gate-Drain Charge		Q _{GD}			9.4		nC
DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS							
Drain-Source Diode Forward Voltage		V _{SD}	V _{GS} =0V, I _S =6.2 A			1.4	V
Maximum Continuous Drain-Source Diode Forward Current		I _S				6.2	A
Maximum Pulsed Drain-Source Diode Forward Current		I _{SM}				24.8	A
Reverse Recovery Time		t _{rr}	V _{GS} =0V, I _S =6.2A,		290		ns
Reverse Recovery Charge		Q _{RR}	dI _F /dt =100 A/μs (Note 1)		2.35		μC

Notes: 1. Pulse Test: Pulse width $\leq 300\mu s$, Duty cycle $\leq 2\%$.

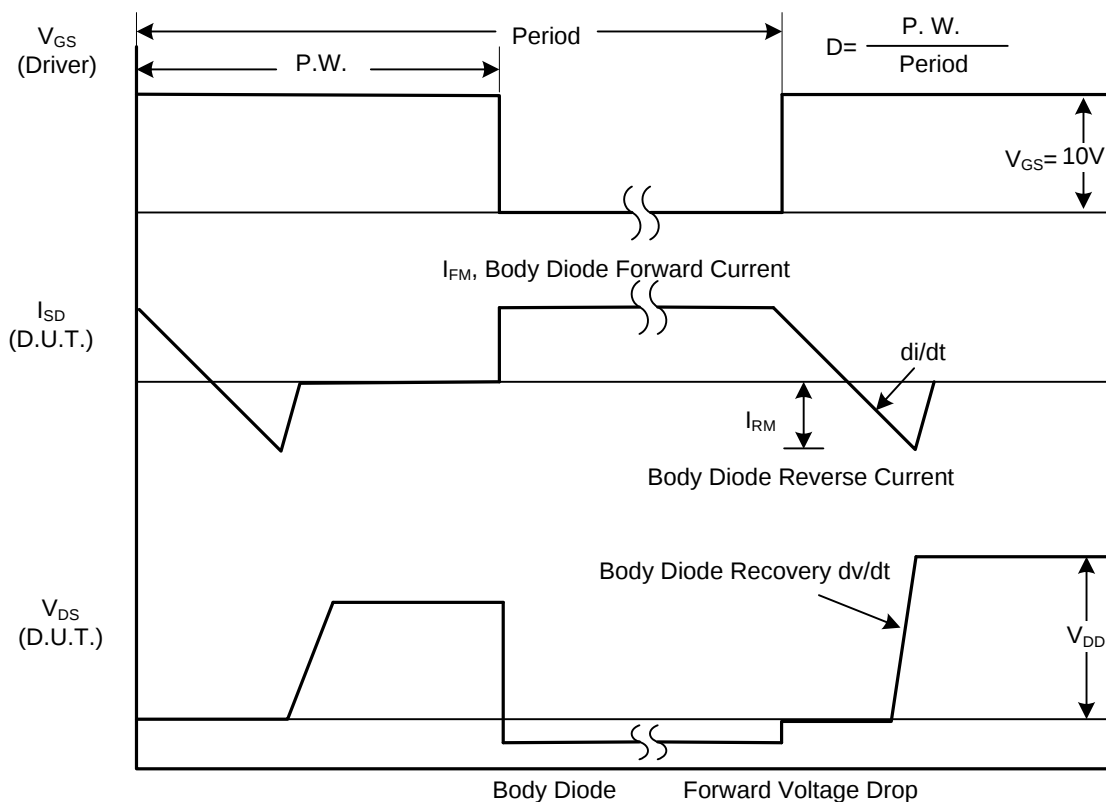
2. Essentially independent of operating temperature.



TEST CIRCUITS AND WAVEFORMS



Peak Diode Recovery dv/dt Test Circuit



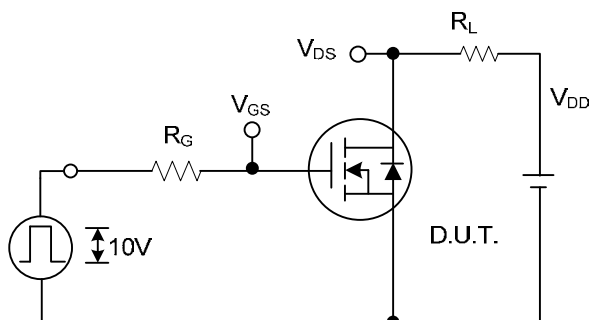
Peak Diode Recovery dv/dt Waveforms



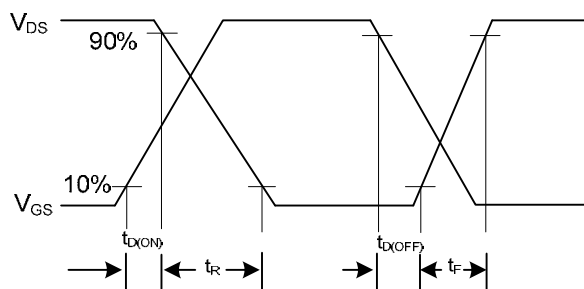
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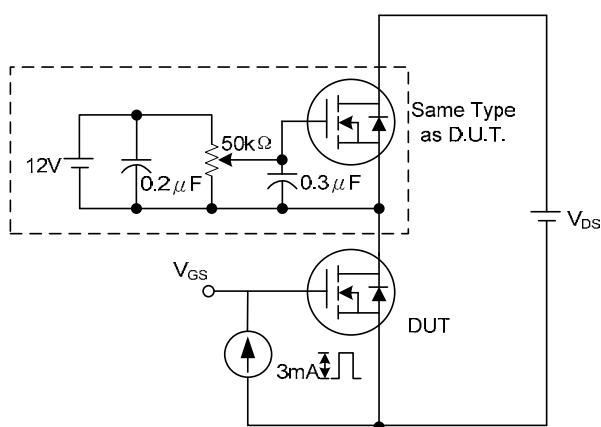
TEST CIRCUITS AND WAVEFORMS(Cont.)



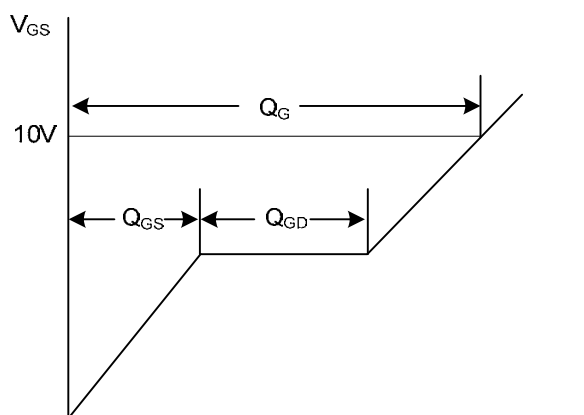
Switching Test Circuit



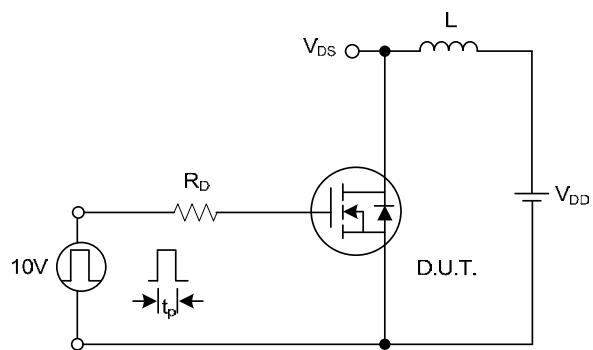
Switching Waveforms



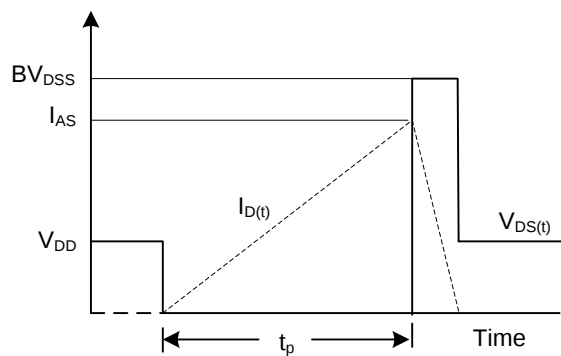
Gate Charge Test Circuit



Gate Charge Waveform



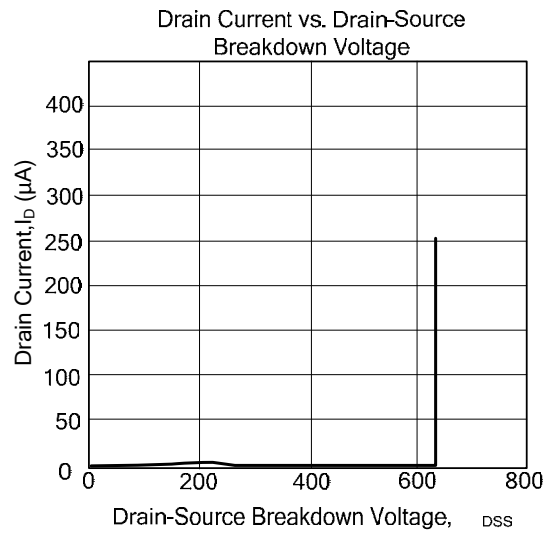
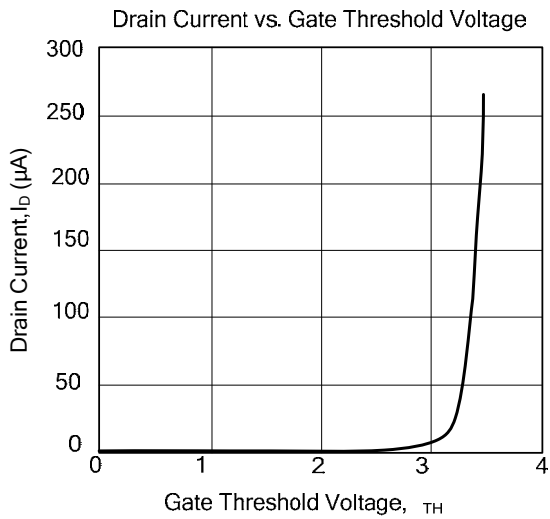
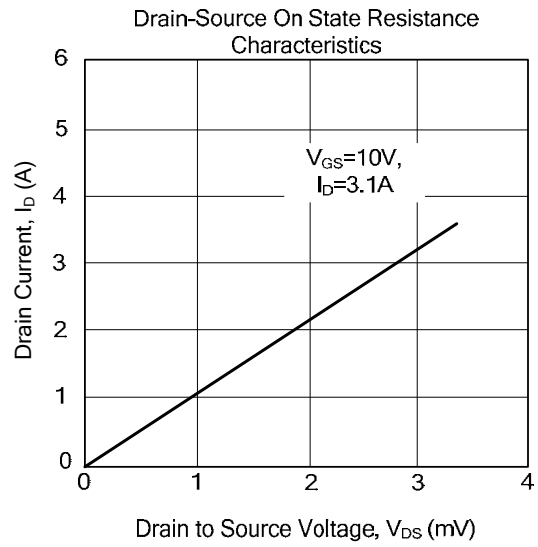
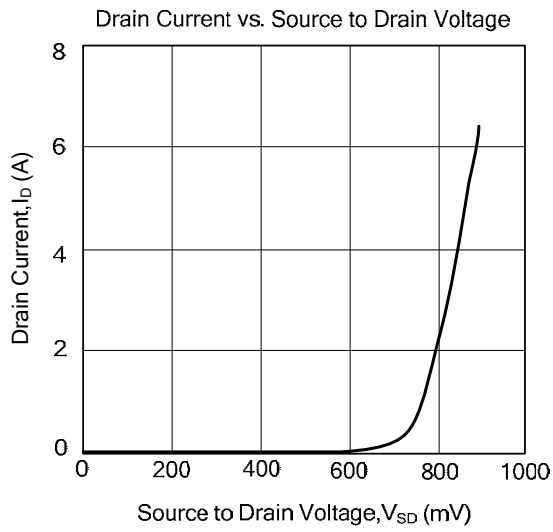
Unclamped Inductive Switching Test Circuit



Unclamped Inductive Switching Waveforms

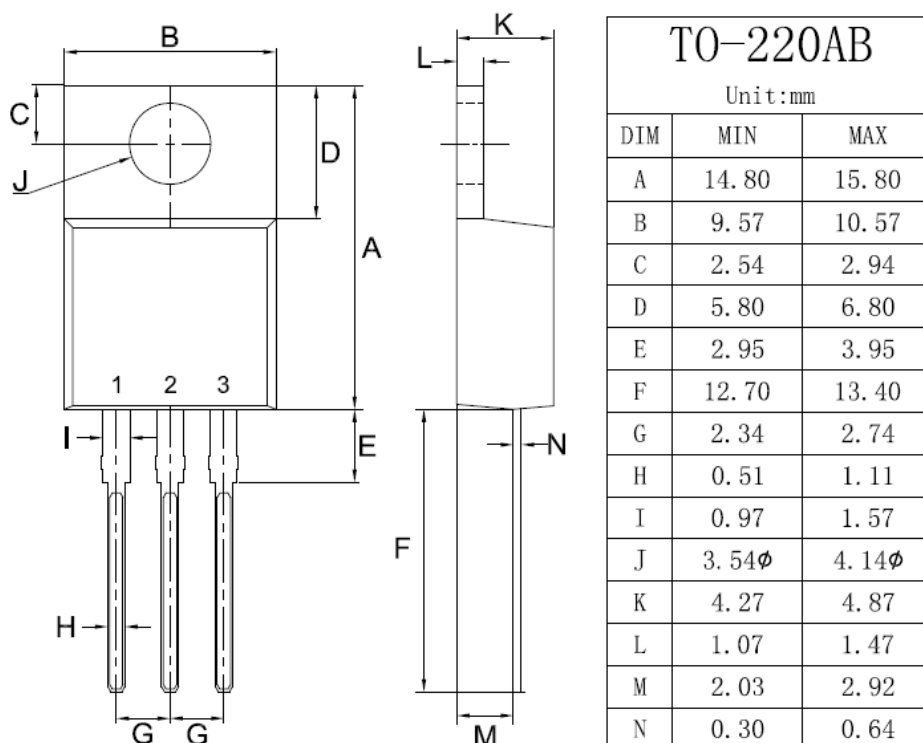


TYPICAL CHARACTERISTICS

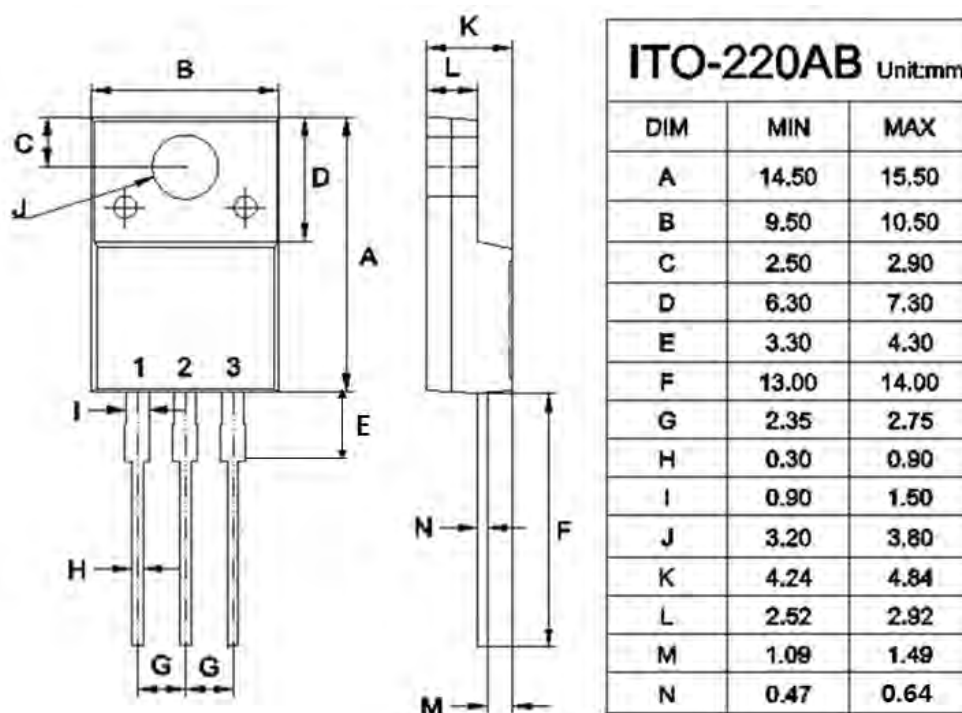




TO-220 Mechanical Drawing

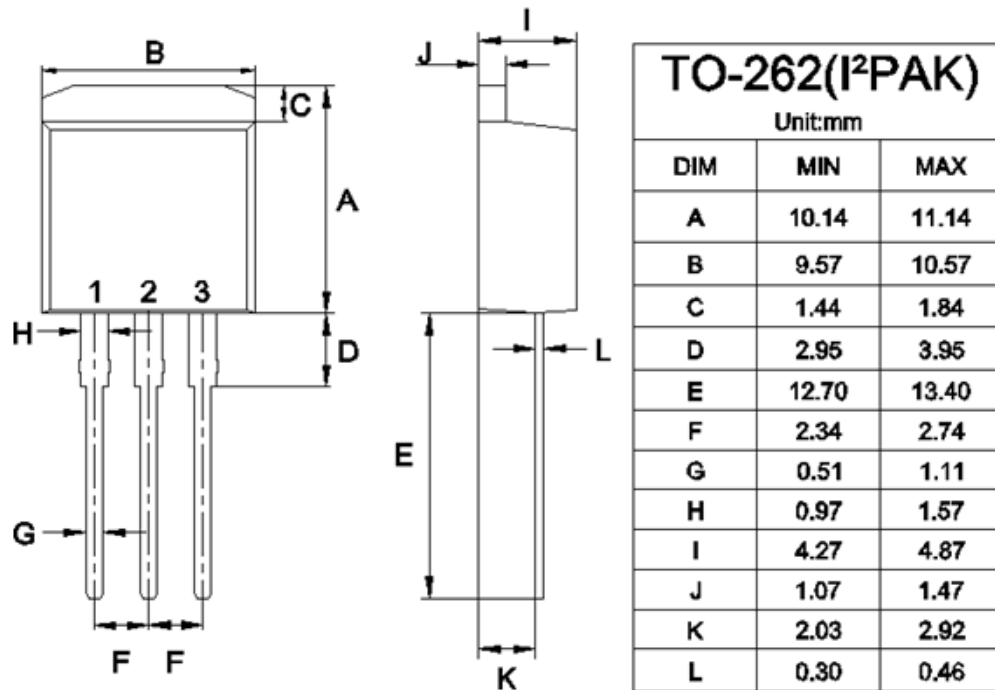


ITO-220 Mechanical Drawing





TO-262 Mechanical Drawing



TO-263 Mechanical Drawing

