SMPCT65N430KT3H

N-Channel Enhancement Mode Field Effect Transistor

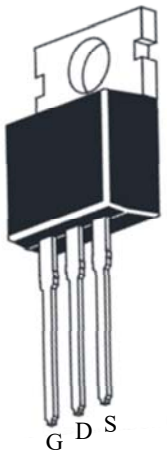
FEATURES

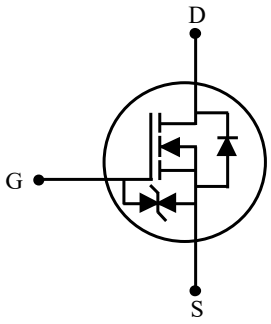
· ESD protected gate

· Suffix "H" indicates Halogen-free parts, ex.SMPCT65N430KT3H

PIN CONFIGURATION

TO-220





D	Drain
G	Gate
S	Source

Maximum Ratings(T_A =25 ℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	650	V
Gate-Source Voltage	V_{GS}	±30	
Drain Current T_C=25℃	I_D	6.7	A
Drain Current T_C=100℃		4.2	
Pulsed Drain Current (Note 1)	I_{DM}	25	A
Avalanche Current	I_{AS}	2.1	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	174	mJ
Power Dissipation T_C=25℃	P_D	44.4	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	55	℃/W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	2.8	℃/W
Operating Junction and Storage Temperature Range	T_J,T_{stg}	- 55 to + 150	℃

Note:

1. The data tested by pulsed, pulse width ≦100μs, duty cycle ≦2%, Reptitive rating, pulse width limited by junction temperature $T_{J(MAX)}$=150℃

2. Limited by $T_{J(MAX)}$, starting T_J=25℃, L=79mH, R_g=25Ω, I_{AS}=2.1A, V_{GS}=10V.

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Electrical Characteristics(T_A=25 ℃ unless otherwise specified)

Parameter	Conditions	Symbol	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	I_D=250μA	$V_{(BR)DSS}$	650	-	-	V
Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	$V_{GS(th)}$	2.0	-	4.0	V
Zero Gate Voltage Drain Current	V_{DS}=520V	I_{DSS}	-	-	1	μA
Gate Leakage Current	V_{GS}=±24V	I_{GSS}	-	-	±1	μA
Drain-Source On-Resistance	V_{GS}=10V, I_D=4A	$R_{DS(on)}$	-	340	430	mΩ
Forward Transconductance	V_{DS}=5V, I_D=4A	g_{FS}	-	8.6	-	S
Dynamic						
Gate Resistance	V_{DS}=0V, V_{GS}=0V, f=1MHz	R_g	-	12.3	-	Ω
Total Gate Charge	V_{DS}=325V, V_{GS}=10V, I_D=4A	Q_g	-	18.4	-	nC
Gate-Source Charge		Q_{gs}	-	4.0	-	
Gate-Drain Charge		Q_{gd}	-	6.5	-	
Input Capacitance	V_{DS}=325V, V_{GS}=0V, f=1MHz	C_{iss}	-	722	-	pF
Output Capacitance		C_{oss}	-	24	-	
Reverse Transfer Capacitance		C_{rss}	-	5.9	-	
Turn on Delay Time	V_{DS}=325V, I_D=4A, V_{GS}=10V, R_g=24Ω	$t_{d(on)}$	-	43	-	ns
Turn on Rise Time		t_r	-	13	-	
Turn off Delay Time		$t_{d(off)}$	-	43	-	
Turn off Fall Time		t_f	-	50	-	
Drain-Source Body Diode						
Diode Forward Voltage	V_{GS}=0V, I_S=1A	V_{SD}	-	-	1.4	V
Diode Continuous Forward Current	-	I_S	-	-	6.7	A
Diode Pulse Current		I_{SM}	-	-	25	A
Reverse Recovery Time	I_S=4A, di/dt=100A/μs	t_{rr}	-	184	-	ns
Reverse Recovery Charge		Q_{rr}	-	1.6	-	μC

RATINGS AND CHARACTERISTIC CURVES

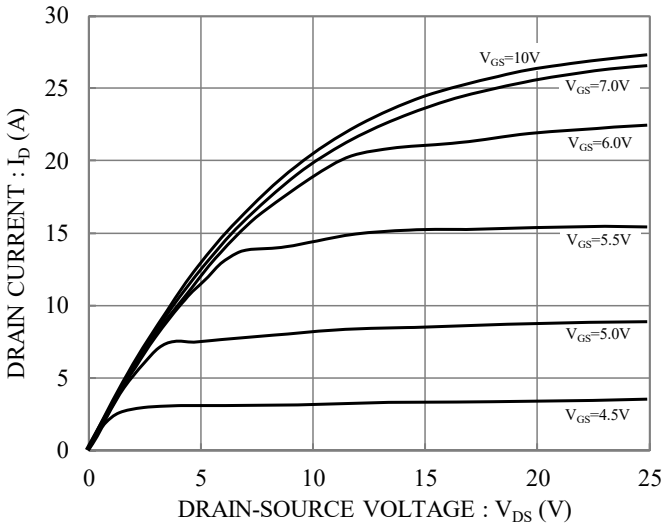

Fig.1 Typical Output Characteristics

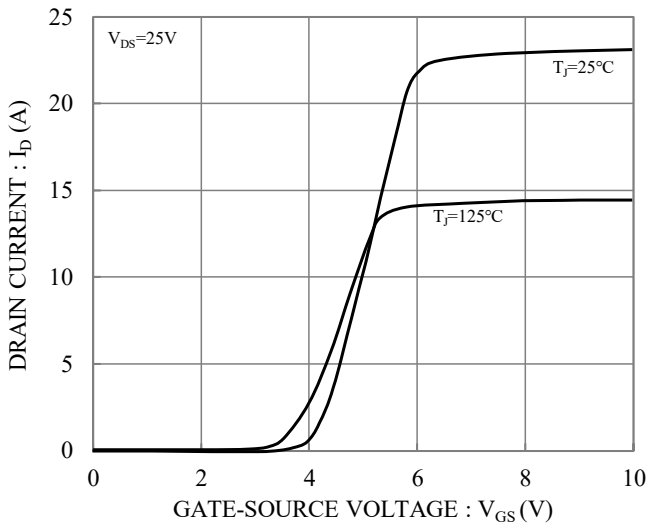

Fig.2 Typical Transfer Characteristics

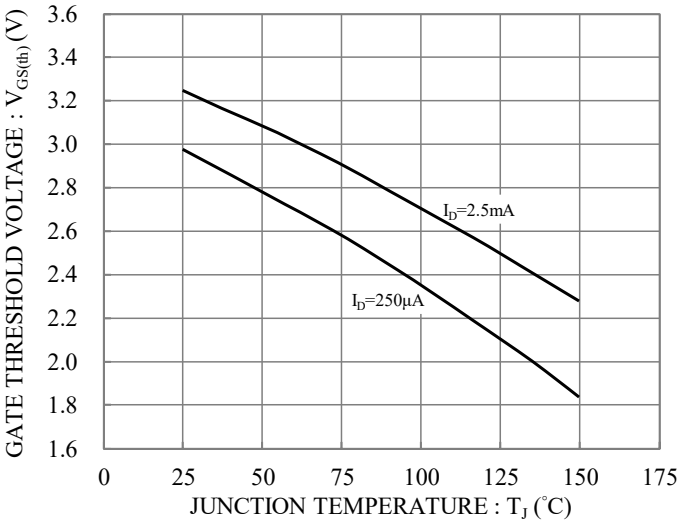

Fig.3 Gate Threshold Voltage vs. Junction Temperature

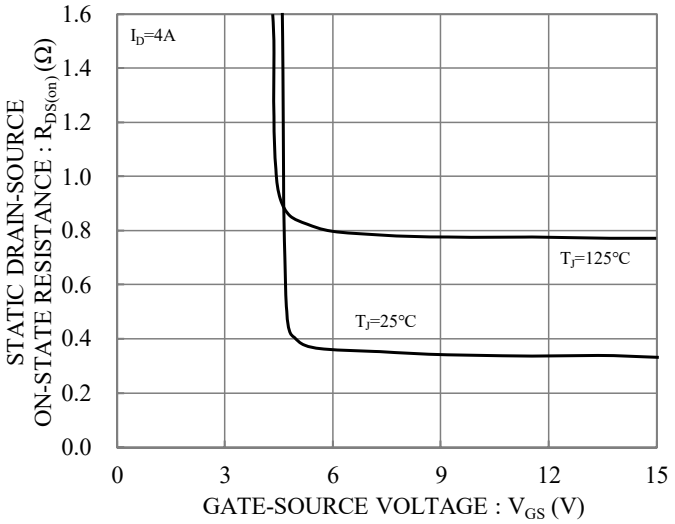

Fig.4 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

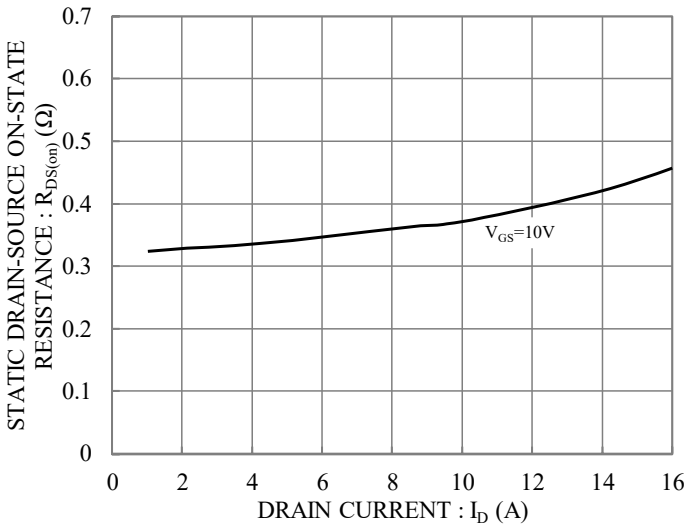

Fig.5 Static Drain-Source On-State Resistance vs. Drain Current

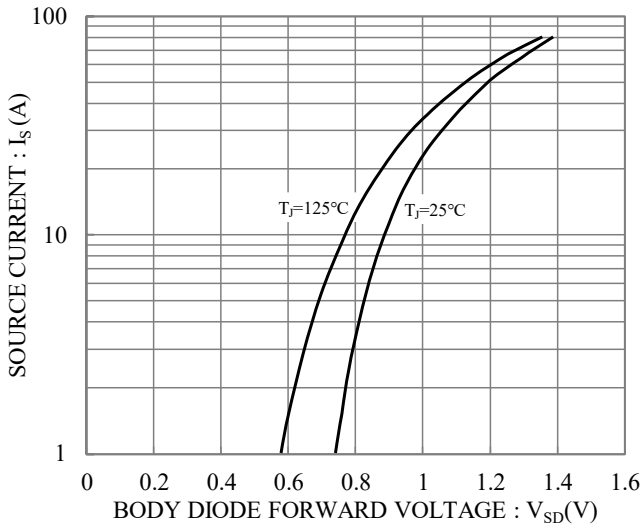

Fig.6 Body Diode Forward Voltage vs. Source Current

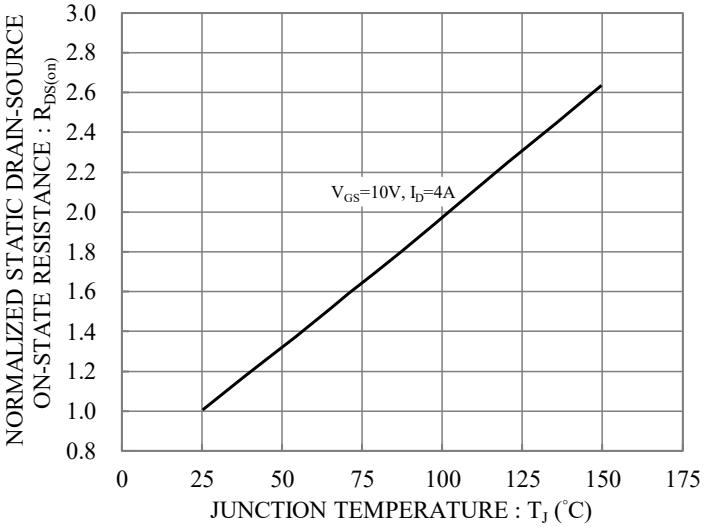

Fig.7 Drain-Source On-State Resistance vs. Junction Tempearture

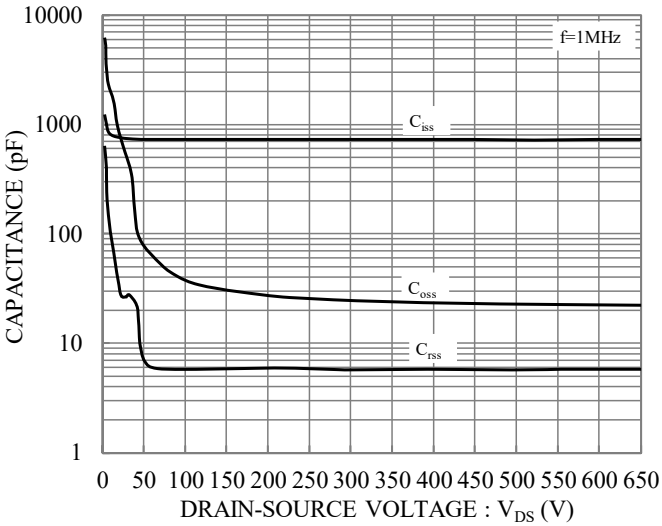

Fig.8 Capacitance vs. Drain-Source Voltage

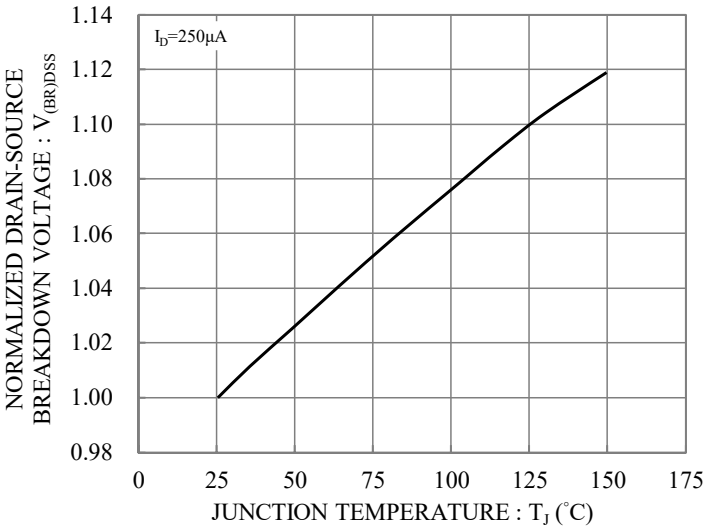

Fig.9 Breakdown Voltage vs. Junction Temperature

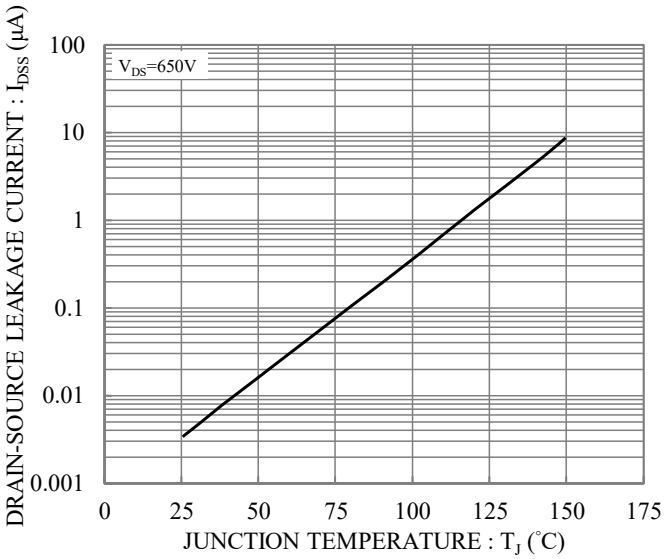

Fig.10 Drain-Source Leakge Current vs. Junction Temperature

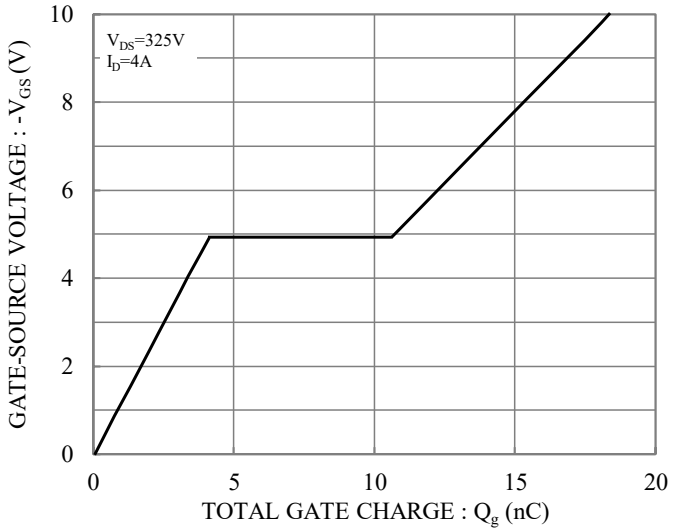

Fig.11 Gate Charge Characteristics

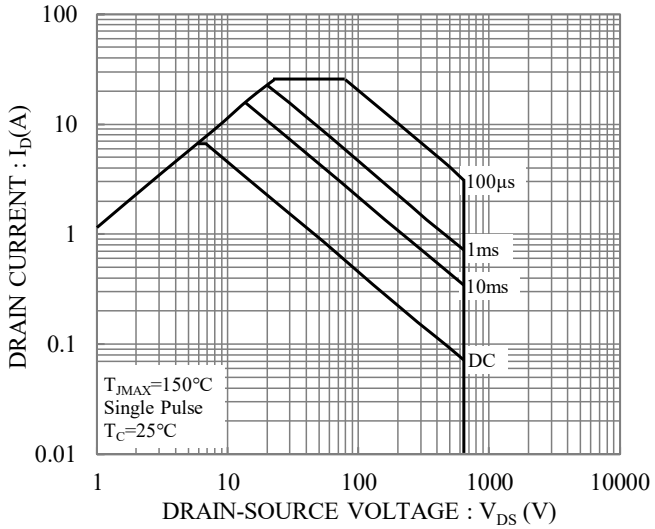

Fig.12 Safe Operation Area

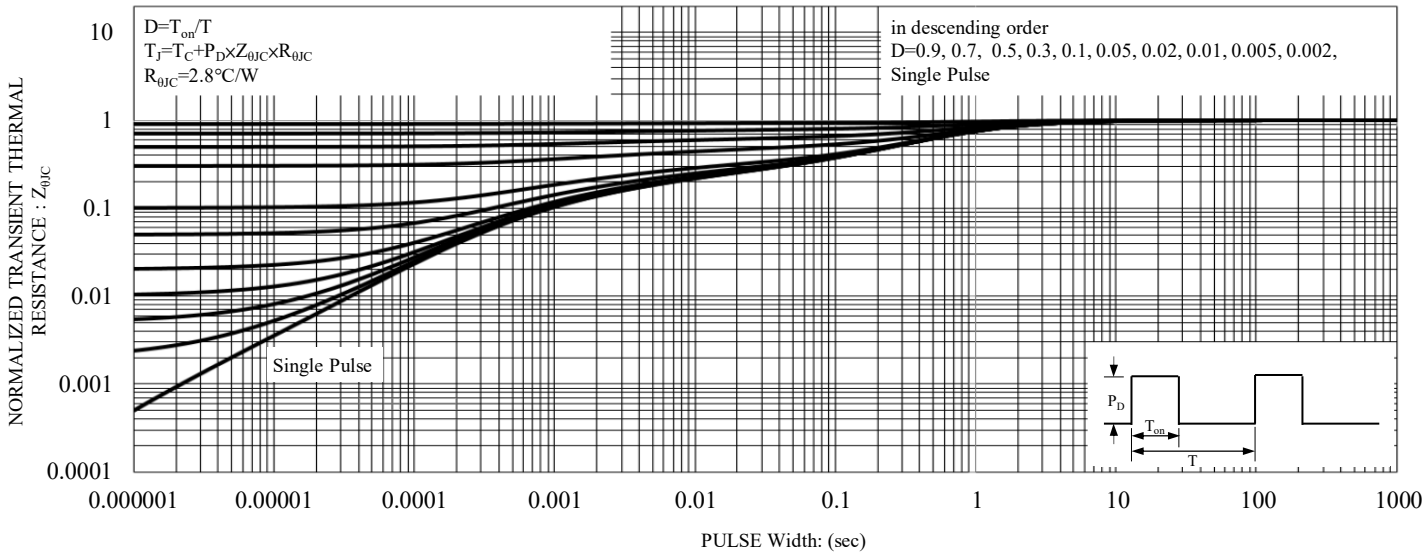

Fig.13 Maximum Transient Thermal Impedance

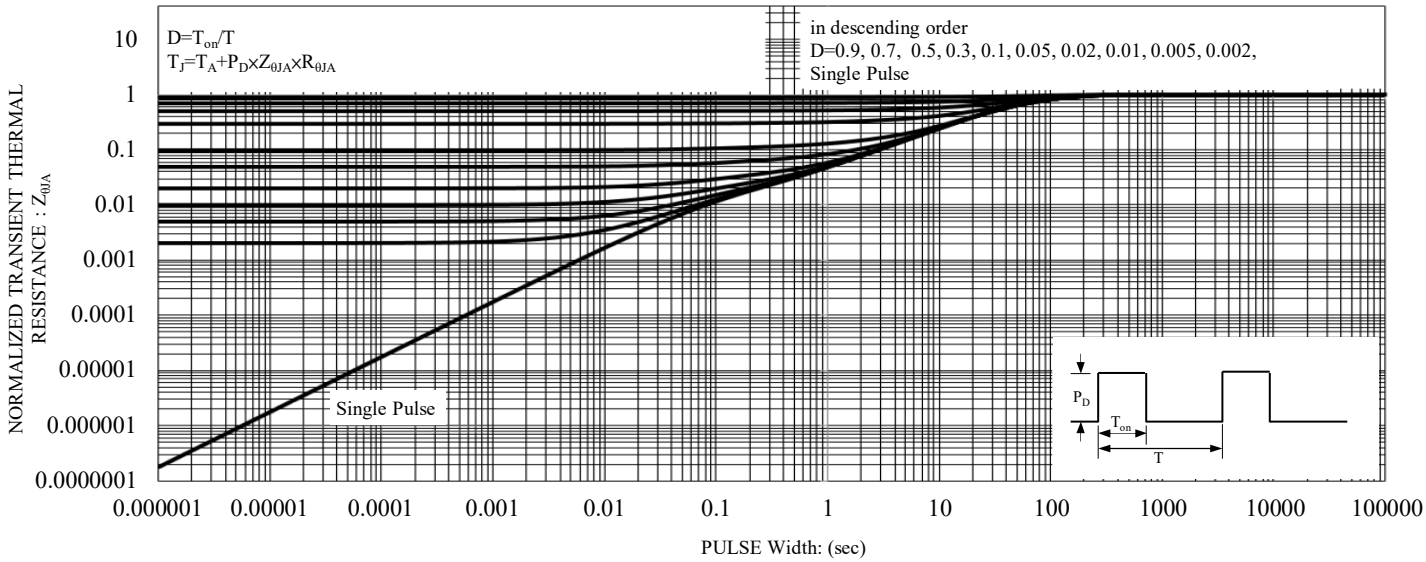

Fig.14 Maximum Transient Thermal Impedance

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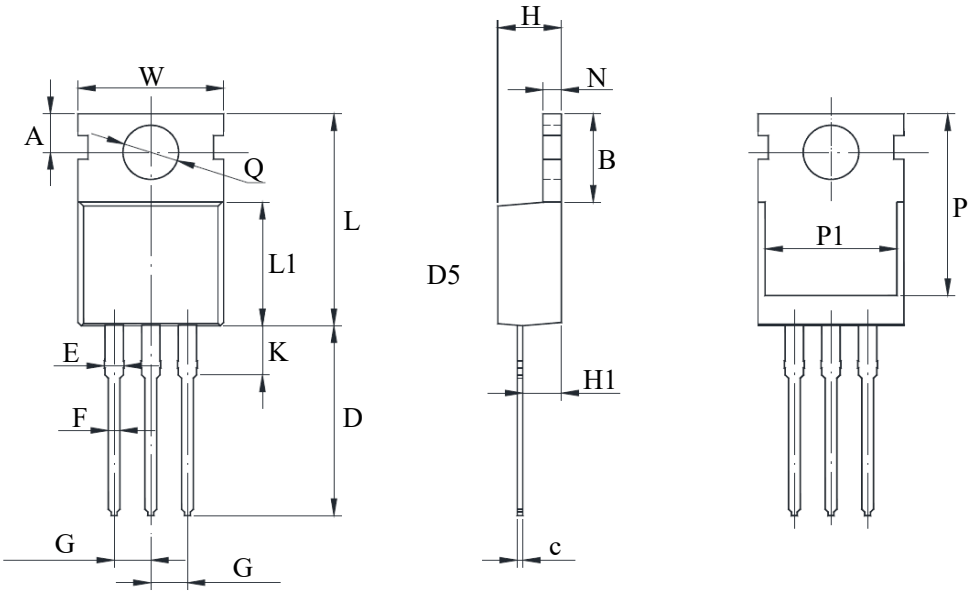
PACKAGE DIMENSION **TO-220**



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	2.70	2.90	0.106	0.114
B	6.40	6.80	0.252	0.268
C	0.30	0.70	0.012	0.028
D	11.00	15.00	0.433	0.591
E	1.10	1.50	0.043	0.059
F	0.70	0.90	0.028	0.035
G	2.54 TYP.		0.100 TYP.	
W	9.80	10.20	0.386	0.402
H	4.30	4.70	0.169	0.185
H1	2.20	2.50	0.087	0.098
K	2.70	3.10	0.106	0.122
L	14.80	16.80	0.583	0.661
L1	9.00	9.40	0.354	0.370
N	1.20	1.40	0.047	0.055
P	12.70	13.30	0.500	0.524
P1	7.60	8.20	0.299	0.323
Q	3.50	3.70	0.138	0.146