



650, 4A, 2.3Ω N-Channel MOSFETs

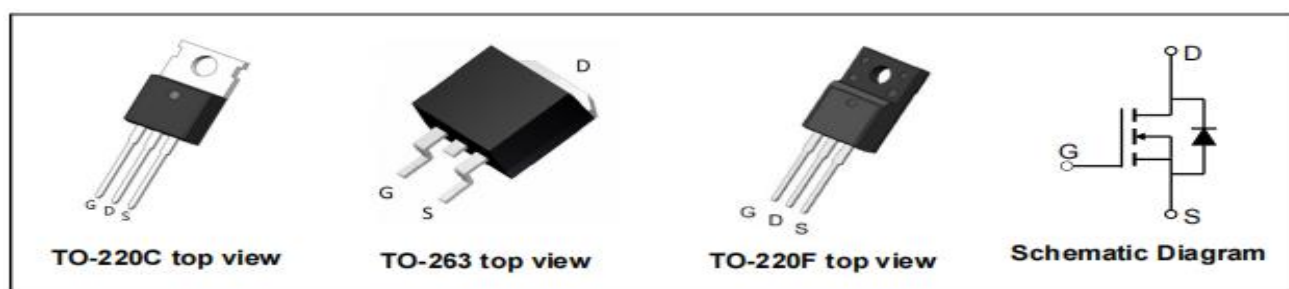
Features

- Low Gate Charge
- Excellent $R_{DS(ON)}$
- Great current Capability
- Green product RoHS compliant

Product Summary

RoHS

V_{DS}	650	V
$V_{GS(th_Typ)}$	3.4	V
$R_{DS(ON_Typ)} (@ V_{GS} = 10V)$	2.3	Ω
I_D (at $V_{GS} = 10V$) ⁽¹⁾	4	A



Type	Package	Marking	Outline	Media	Quantity(pcs)
4N65	TO-220C	-	-	Tube	50
4N65	TO-263	-	Tape	13"Reel	800
4N65	TO-220F	-	-	Tube	50

Absolute Maximum Ratings ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	SDM4N65AC/ Y	SDM4N65AF	Unit
Drain-Source Voltage	V_{DS}	650		V
Gate-Source Voltage	V_{GS}	± 30		V
Continuous Drain Current ⁽¹⁾	$T_C = 25^\circ\text{C}$	4	4*	A
	$T_C = 100^\circ\text{C}$	2.6	2.6*	A
Pulsed Drain Current ⁽²⁾	I_{DM}	16		A
Avalanche Energy ⁽³⁾	E_{AS}	84		mJ
Power Dissipation ⁽⁴⁾	$T_C = 25^\circ\text{C}$	114	30	W
	$T_C = 100^\circ\text{C}$	45	12	
Body-Diode Continuous Current	I_S	4		A
Avalanche Current ⁽³⁾	I_{AS}	4.6		A
Junction and Storage Temperature Range	T_{STG}, T_J	-55 to 150		$^\circ\text{C}$
Thermal Resistance Junction-Ambient	$R_{\theta JA}$	62	63	$^\circ\text{C/W}$
Thermal Resistance Junction-Case	$R_{\theta JC}$	1.1	4.2	$^\circ\text{C/W}$



Electrical Characteristics(T_J=25℃ unless otherwise noted)

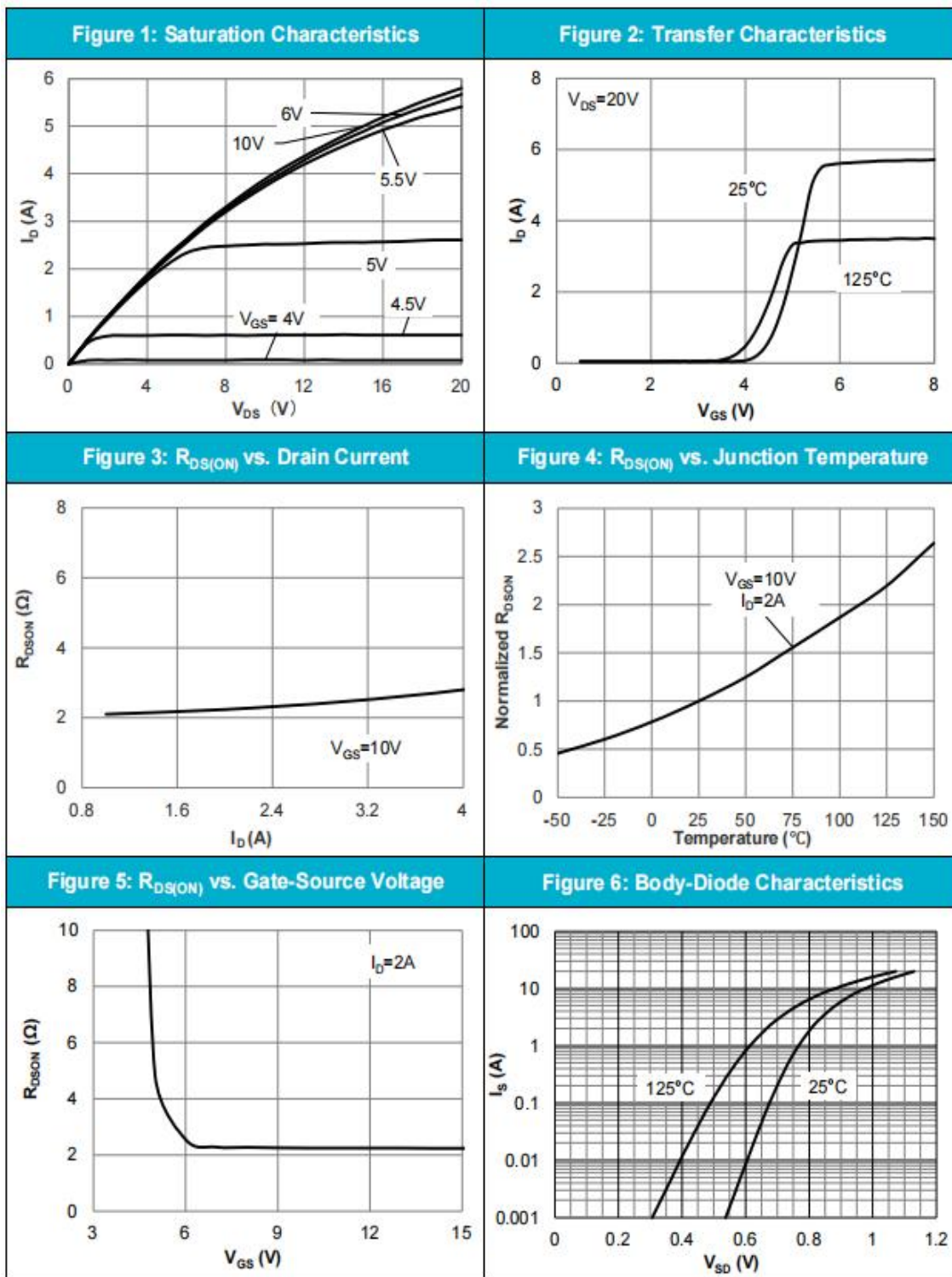
Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	650	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V, T _J =25℃	-	-	1	μA
		V _{DS} =650V, V _{GS} =0V, T _J =55℃	-	-	5	
Gate Body Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	-	-	±100	nA
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2.5	3.5	4.5	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =2A	-	2.2	2.6	Ω
Forward Trans conductance ⁴	g _{fs}	V _{DS} =5V, I _D =2A	-	3	-	S
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =25V, f=1.0MHz	-	525	-	pF
Output Capacitance	C _{oss}		-	53	-	
Reverse Transfer Capacitance	C _{rss}		-	5.7	-	
Gate Resistance	R _g	V _{GS} =0V, V _{DS} =0V, f=1.0MHz	-	1.1	-	Ω
Total Gate Charge	Q _g	V _{DS} =520V, I _D =4A, V _{GS} =10V	-	17.9	-	nC
Gate-Source Charge	Q _{gs}		-	7.5	-	
Gate-Drain Charge	Q _{gd}		-	4.3	-	
Turn-on Delay Time	T _{d(on)}	R _G =25Ω, V _{DS} =325V, I _D =4A	-	17	-	nS
Turn-on Rise Time	t _r		-	27	-	
Turn-Off Delay Time	T _{d(off)}		-	31	-	
Turn-Off Fall Time	T _f		-	21	-	
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =2A	-	0.8	1.2	V
Body Diode Reverse Recovery Time	T _{rr}	V _R =400V, I _F =4A, di/dt=100A/μs	-	213	-	Ns
Body Diode Reverse Recovery Charge	Q _{rr}		-	1.5	-	μC

Note :

1. Computed continuous current assumes the condition of T_{J_Max} while the actual continuous depends on the thermal & electro mechanical application board design.
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature.
3. This single-pulse measurement was taken under the following condition [L=10mH, V_{GS}=10V, V_{DS}=50V] while its value is limited by T_{J_Max}=150℃.
4. The power dissipation P_D is based on T_{J_Max}=150℃.
5. This value is guaranteed by design hence it is not included in the production test.

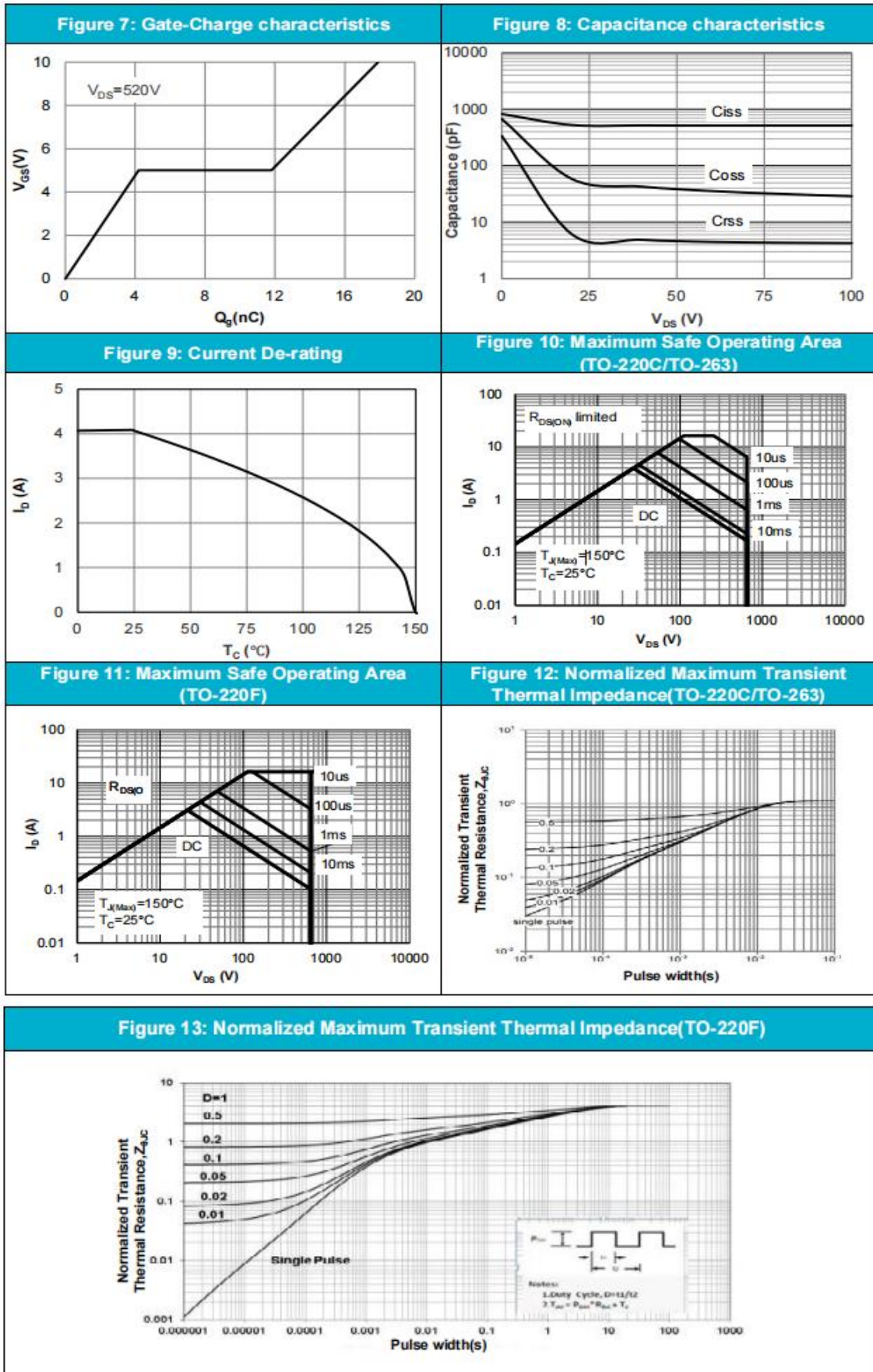


Typical Electrical and Thermal Characteristics



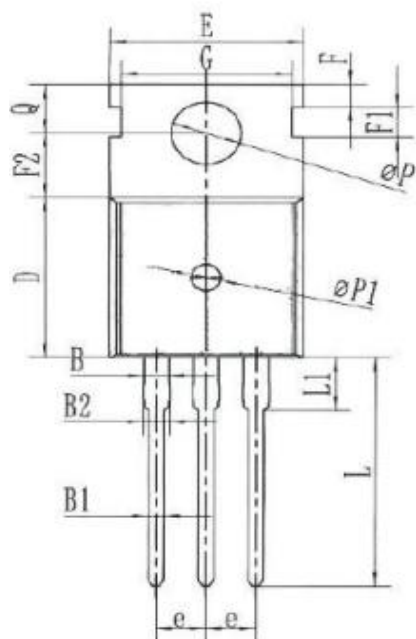


Typical Electrical and Thermal Characteristics

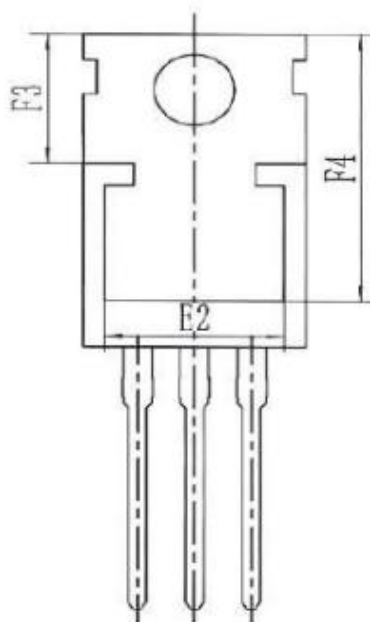




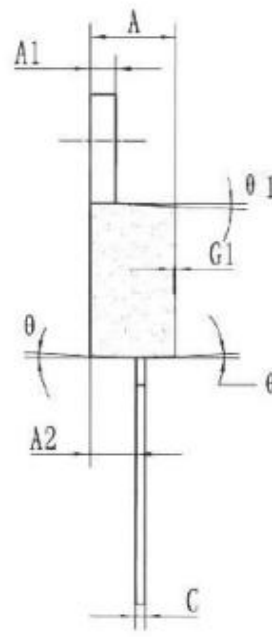
TO-220C Package Information



TOP VIEW



BOTTOM VIEW



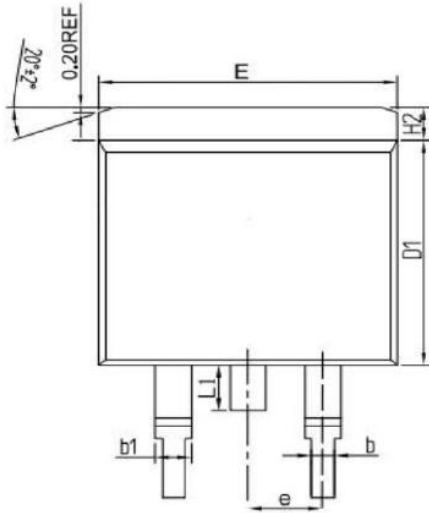
SIDE VIEW

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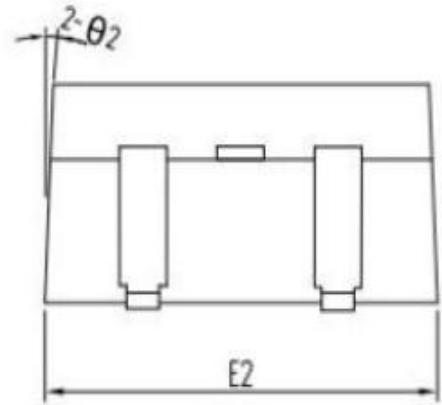
SYMBOL	MILLIMETER		
	MIN	TYP.	MAX
A	4.40	4.50	4.60
A1	1.25	1.30	1.35
A2	2.30	2.40	2.50
B	1.22	1.27	1.32
B1	0.70	0.80	0.90
B2	1.32	1.37	1.42
C	0.45	0.50	0.55
D	9.10	9.20	9.30
E	9.70	9.90	10.1
E1	9.90	10.00	10.10
E2	7.80	8.00	8.20
e	2.54 BSC		
F	1.22	1.30	1.38
F1	1.60	1.70	1.80
F2	3.60	3.70	3.80
F3	6.30	6.50	6.70
F4	13.10	13.40	13.70
G	8.60	8.70	8.80
G1	0.05	0.10	0.15
L	12.80	13.10	13.40
L1	2.80	3.00	3.20
ϕP	3.50	3.60	3.70
Q	2.70	2.80	2.90



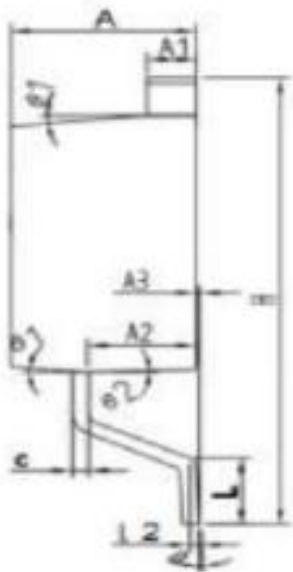
TO-263 Package Information



TOP VIEW



SIDE VIEW

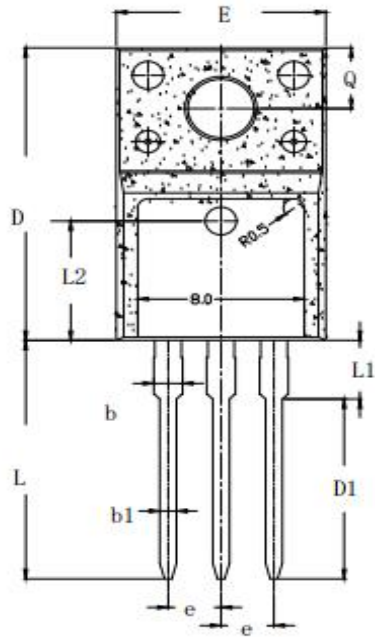


SIDE VIEW

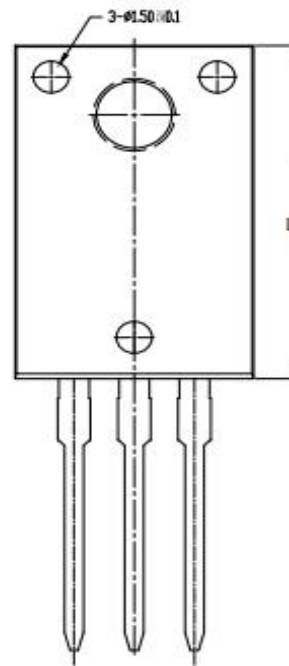
SYMBOL	MILLIMETER		
	MIN	TYP.	MAX
A	4.40	4.57	4.70
A1	1.22	1.27	1.32
A3	0.00	-	0.10
b	0.74	0.78	0.87
c	0.34	0.38	0.47
E	9.93	10.03	10.13
e	2.54BSC		
H	14.7	15.1	15.5
L	2.00	2.3	2.6



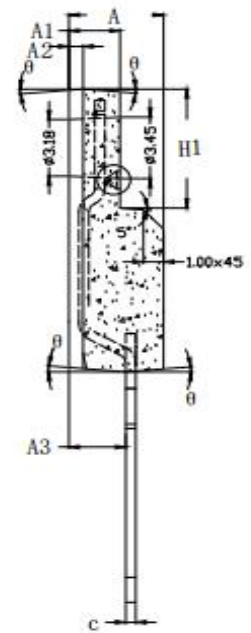
TO-220F Package Information



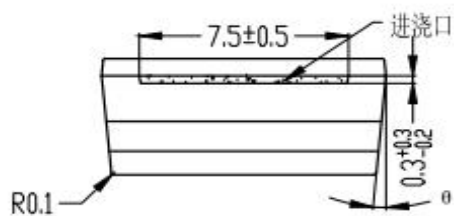
TOP VIEW



BOTTOM VIEW



SIDE VIEW



SIDE VIEW

SYMBOL	MILLIMETER		
	MIN	TYP.	MAX
A	4.60	4.70	4.80
A1	2.39	2.54	2.69
A2	0.60	0.70	0.80
A3	2.81	2.82	2.83
b	1.61	1.62	1.63
b1	-	0.80	-
c	-	0.50	-
D	15.72	15.87	16.02
D1	-	9.75	-
E	9.91	10.06	10.21
e	2.54 BSC		
H1	6.67	6.68	6.69
L	12.90	12.93	12.96
L1	-	3.18	-
L2	6.47 REF		
Q	-	3.30	-
θ1	1°	3°	5°