

Description

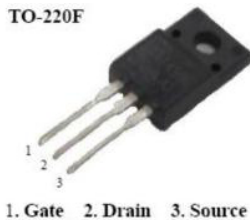
EHV650R86NT N-channel Enhancement Mode Power MOSFET

Features

- 650V,8A
- $R_{DS(ON)}=0.86 \Omega @ V_{GS}=10V$
- Advanced Trench Technology
- Provide Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired

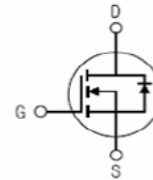
Application

Power switch circuit of adaptor and charger



TO-220F

Inner Equivalent Principium Chart



Schematic Diagram

Package Marking and Ordering Information

Device Marking	Device	OUTLINE	Device Package	TUBE (PCS)	Inner BOX (PCS)	Per Carton (PCS)
EHV650R86NT	EHV650R86NT	TAPING	TO-220F	13inch	2500	25000

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

Symbol	Parameter	Max.	Units
V_{DSS}	Drain-Source Voltage	650	V
V_{GSS}	Gate-Source Voltage	± 30	V
I_D	Continuous Drain Current	$T_C = 25^\circ\text{C}$	8
		$T_C = 100^\circ\text{C}$	5
I_{DM}	Pulsed Drain Current ^{note1}	32	A
E_{AS}	Single Pulsed Avalanche Energy ^{note2}	500	mJ
P_D	Power Dissipation	$T_C = 25^\circ\text{C}$	38
$R_{\theta JC}$	Thermal Resistance, Junction to Case	3.29	$^\circ\text{C/W}$
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	650	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =650V, V _{GS} =0V	-	-	1.0	μA
I _{GSS}	Gate to Body Leakage Current	V _{DS} =0V, V _{GS} =±30V	-	-	±100	nA
On Characteristics						
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250μA	2	-	4	V
R _{DS(on)}	Static Drain-Source on-Resistance <small>note3</small>	V _{GS} =10V, I _D =4A	-	0.86	1.0	Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	1540	-	pF
C _{oss}	Output Capacitance		-	123	-	pF
C _{rss}	Reverse Transfer Capacitance		-	6.6	-	pF
Q _g	Total Gate Charge	V _{DS} =520V, I _D =8A, V _{GS} =10V	-	29	-	nC
Q _{gs}	Gate-Source Charge		-	6	-	nC
Q _{gd}	Gate-Drain("Miller") Charge		-	11.3	-	nC
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time	V _{DS} =325V, I _D =8A, R _{GEN} =10 Ω,	-	24	-	ns
t _r	Turn-on Rise Time		-	18	-	ns
t _{d(off)}	Turn-off Delay Time		-	50	-	ns
t _f	Turn-off Fall Time		-	18	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I _S	Maximum Continuous Drain to Source Diode Forward Current		-	-	8	A
I _{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	32	A
V _{SD}	Drain to Source Diode Forward Voltage	V _{GS} =0V, I _S =8A	-	-	1.5	V
t _{rr}	Body Diode Reverse Recovery Time	T _J =25°C I _S =8A, di/dt=100A/μs	-	427	-	ns
Q _{rr}	Body Diode Reverse Recovery Charge		-	2560	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. L=10mH, I_D=10A, Start T_J=25°C

3. I_{SD} =8A, di/dt ≤100A/us, V_{DD}≤BV_{DS}, Start T_J=25°C

Typical Performance Characteristics

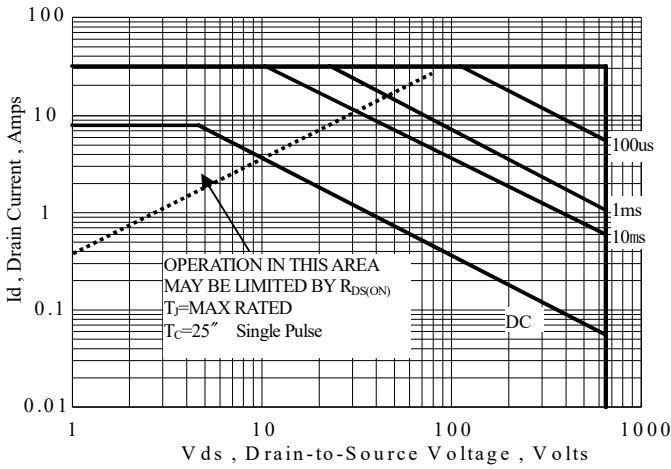


Figure 1 Maximum Forward Bias Safe Operating Area

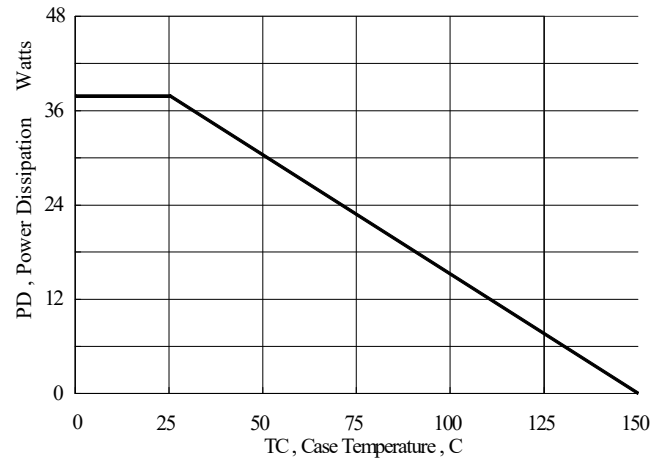


Figure 2 Maximum Power Dissipation vs Case Temperature

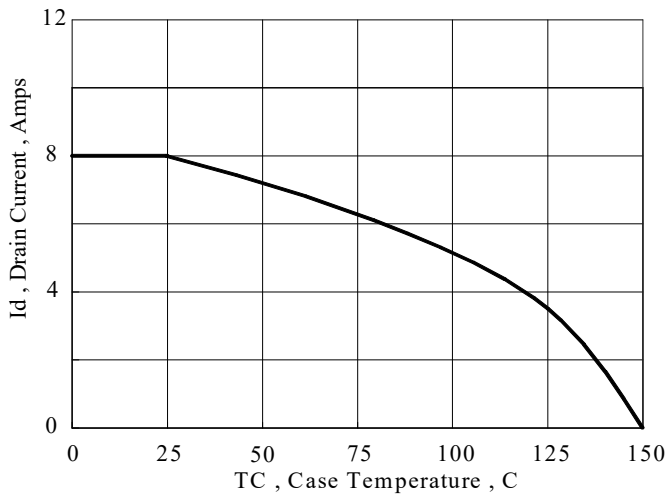


Figure 3 Maximum Continuous Drain Current vs Case Temperature

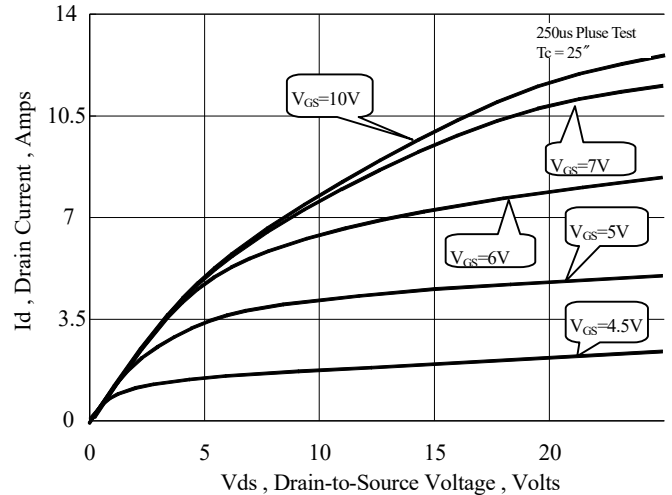


Figure 4 Typical Output Characteristics

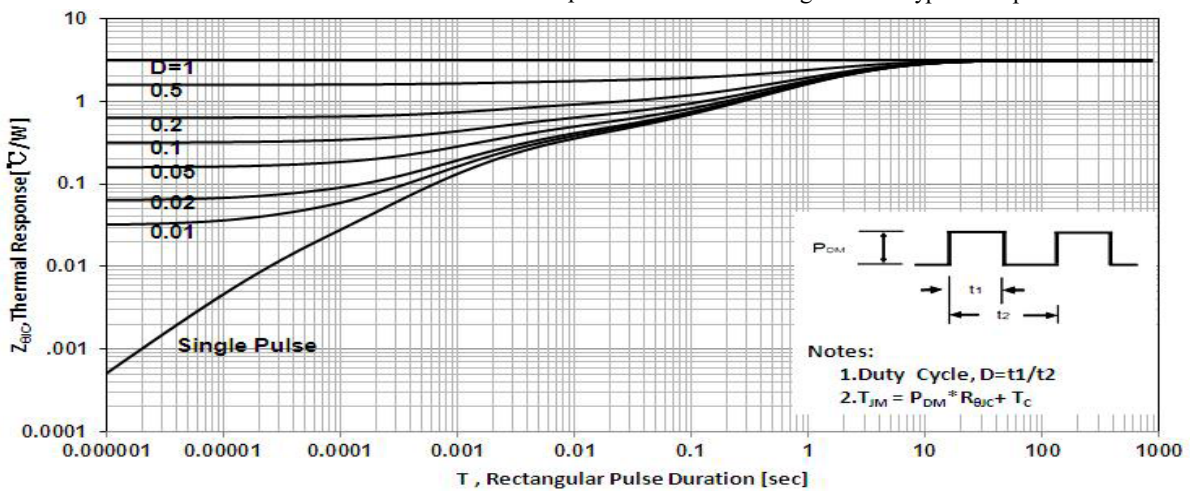


Figure 5 Maximum Effective Thermal Impedance, Junction to Case

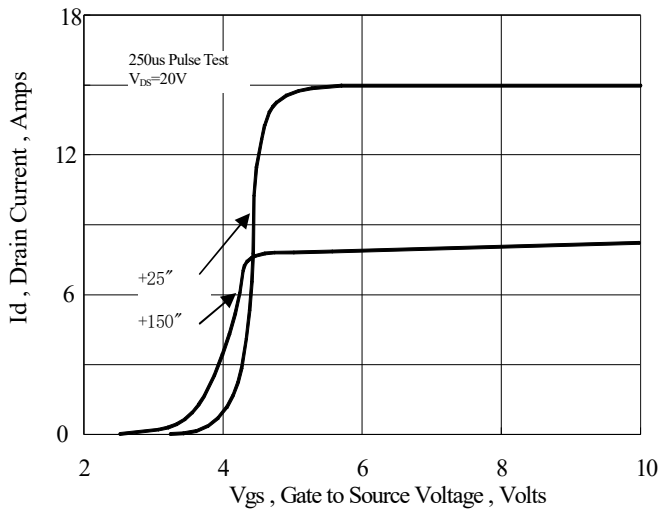


Figure 6 Typical Transfer Characteristics

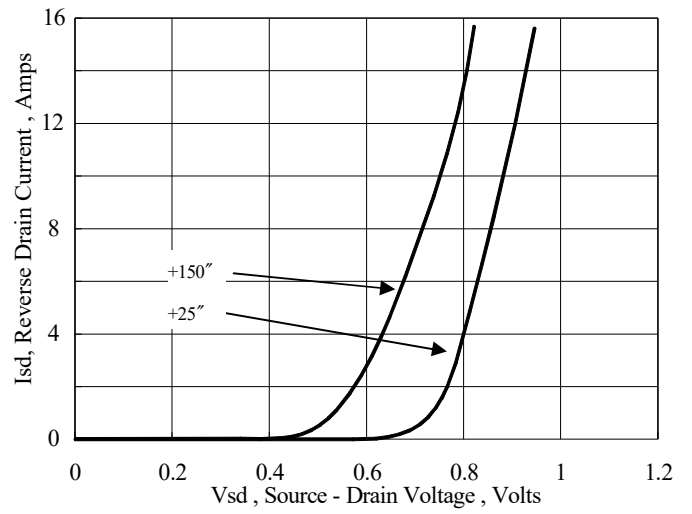


Figure 7 Typical Body Diode Transfer Characteristics

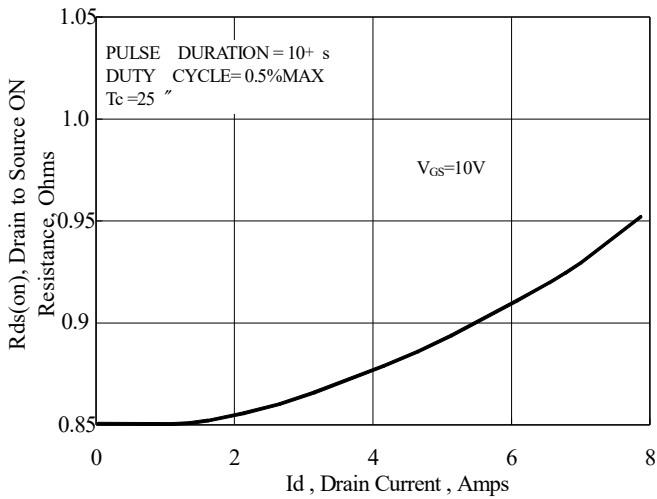


Figure 8 Typical Drain to Source ON Resistance vs Drain Current

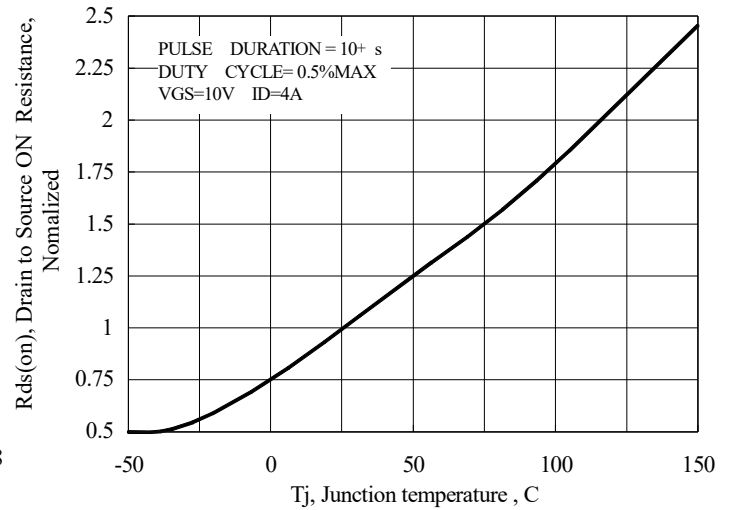


Figure 9 Typical Drain to Source on Resistance vs Junction Temperature

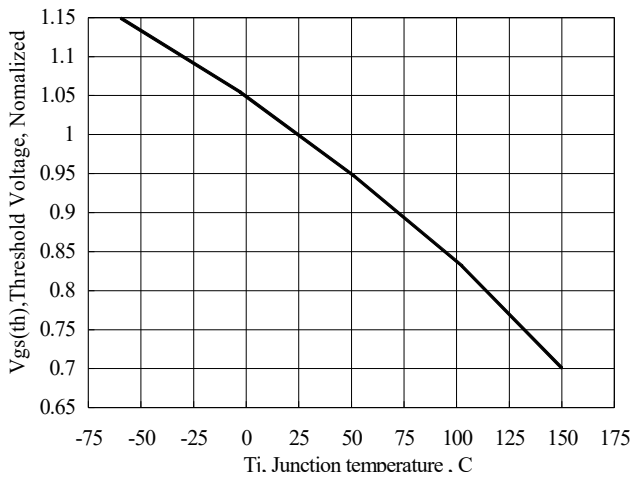


Figure 10 Typical Theshold Voltage vs Junction Temperature

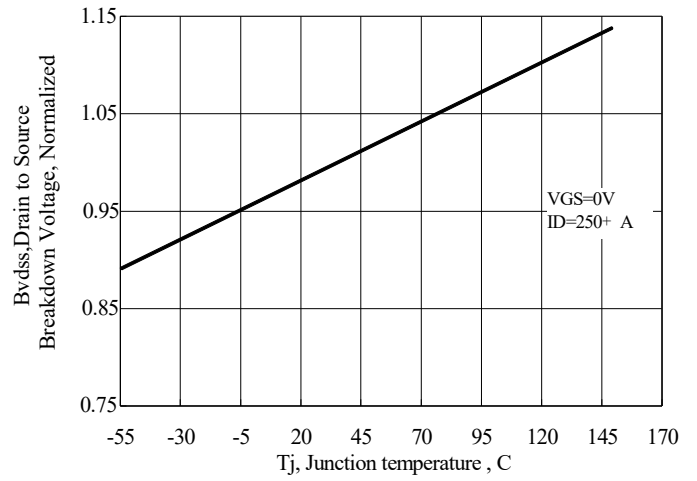


Figure 11 Typical Breakdown Voltage vs Junction Temperature

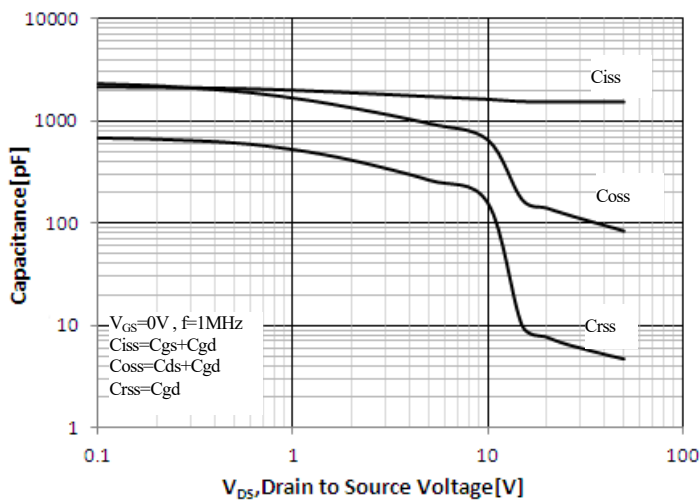


Figure 12 Typical Capacitance vs Drain to Source Voltage

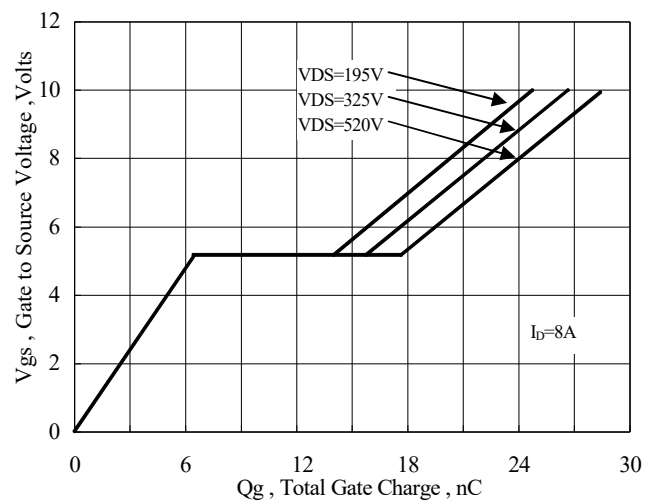


Figure 13 Typical Gate Charge vs Gate to Source Voltage

Test Circuit

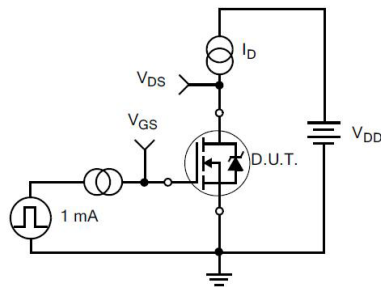


Figure 17. Gate Charge Test Circuit

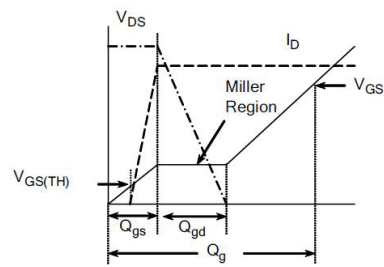


Figure 18. Gate Charge Waveform

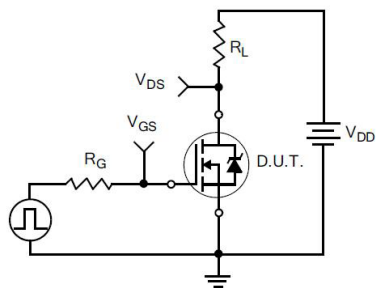


Figure 19. Resistive Switching Test Circuit

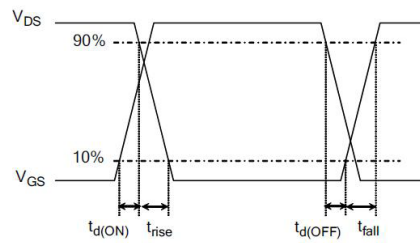


Figure 20. Resistive Switching Waveforms

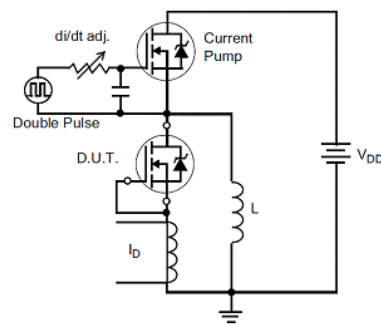


Figure 21. Diode Reverse Recovery Test Circuit

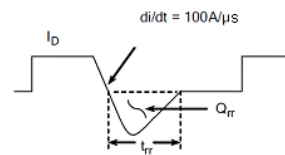


Figure 22. Diode Reverse Recovery Waveform

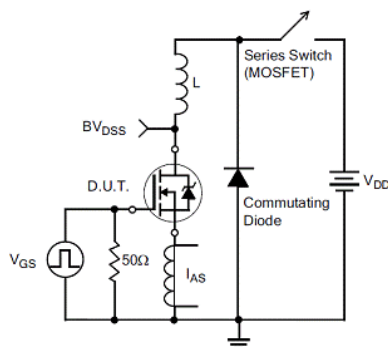


Figure 23. Unclamped Inductive Switching Test Circuit

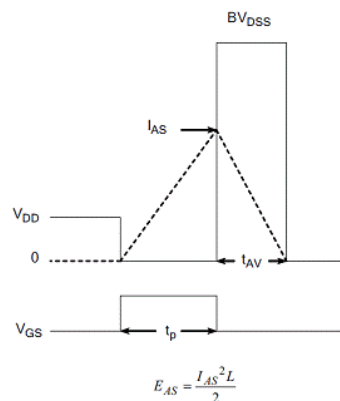
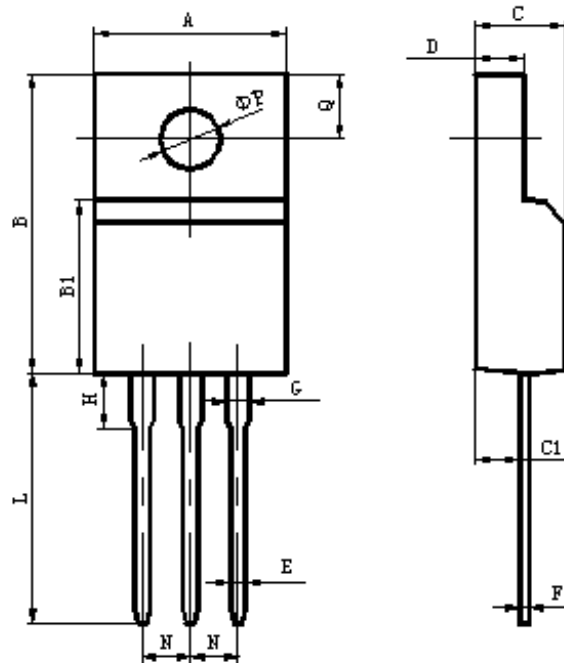


Figure 24. Unclamped Inductive Switching Waveforms

Package Mechanical Data-TO-220F



Items	Values(mm)	
	MIN	MAX
A	9.60	10.4
B	15.4	16.2
B1	8.90	9.50
C	4.30	4.90
C1	2.10	3.00
D	2.40	3.00
E	0.60	1.00
F	0.30	0.60
G	1.12	1.42
H	3.40	3.80
	2.40	2.90
L*	12.0	14.0
N	2.34	2.74
Q	3.15	3.55
ϕP	2.90	3.30

*adjustable

TO-220F Package

Product Naming Rules

