



TN50H13NTF

N-Channel Enhancement Mode Power MOSFET

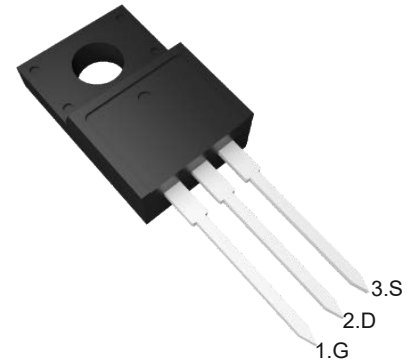
Features

- Fast Switching
- Low Reverse transfer capacitances
- Low gate charge and low $R_{DS(on)}$
- $V_{DS} = 500V, I_D = 13A$
 $R_{DS(on)} < 0.45\Omega @ V_{GS} = 10V$

Applications

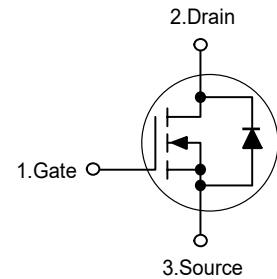
- Power switch circuit of adaptor and charger

TO-220F



1.Gate 2.Drain 3.Source

Schematic diagram



Absolute Maximum Ratings

Ratings at 25°C ambient temperature unless otherwise specified.

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	500	V
Gate-Source Voltage	V_{GS}	± 30	V
Drain Current-Continuous	I_D	13	A
Drain Current-Pulsed ^{Note1}	I_{DM}	52	A
Single pulse avalanche energy ^{Note4}	E_{AS}	900	mJ
Maximum Power Dissipation	P_D	48	W
Junction Temperature	T_J	150	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

Thermal Characteristics

Thermal Resistance, Junction-to-Ambient ^{Note2}	$R_{\theta JA}$	100	°C/W
Maximum Junction-to-Case ^{Note2}	$R_{\theta JC}$	2.6	°C/W



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Electrical Characteristics

(Ta=25°C unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	500	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=500V, V_{GS}=0V$	--	--	1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 30V, V_{DS}=0V$	--	--	± 100	nA
Gate Threshold Voltage ^{Note3}	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu A$	2	--	4	V
Drain-Source On-Resistance ^{Note3}	$R_{DS(on)}$	$V_{GS}=10V, I_D=6.5A$	--	0.34	0.45	Ω
Forward Transconductance ^{Note3}	g_{FS}	$V_{DS}=30V, I_D=13A$	--	15	--	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS}=25V, V_{GS}=0V, f=1MHz$	--	2150	--	pF
Output Capacitance	C_{oss}		--	210	--	pF
Reverse Transfer Capacitance	C_{rss}		--	23	--	pF
Switching Characteristics						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=200V, I_D=10A$ $V_{GS}=13V, R_G=6.1\Omega$	--	15	--	nS
Turn-on Rise Time	t_r		--	25	--	nS
Turn-off Delay Time	$t_{d(off)}$		--	45	--	nS
Turn-off Fall Time	t_f		--	35	--	nS
Total Gate Charge	Q_g	$V_{DD}=250V, I_D=13A, V_{GS}=10V$	--	45	--	nC
Gate-Source Charge	Q_{gs}		--	10	--	nC
Gate-Drain Charge	Q_{gd}		--	18	--	nC
Source-Drain Diode Characteristics						
Diode Forward Voltage ^{Note3}	V_{SD}	$V_{GS}=0V, I_S=13A$	--	--	1.5	V
Diode Forward Current ^{Note2}	I_S		--	--	13	A

Note: 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

2.Surface Mounted on FR4 Board, $t \leq 10$ sec.

3.Pulse Test: Pulse width $\leq 380\mu s$, duty cycle $\leq 2\%$.

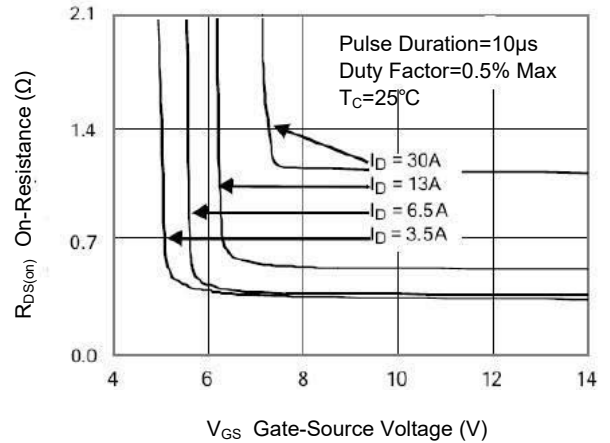
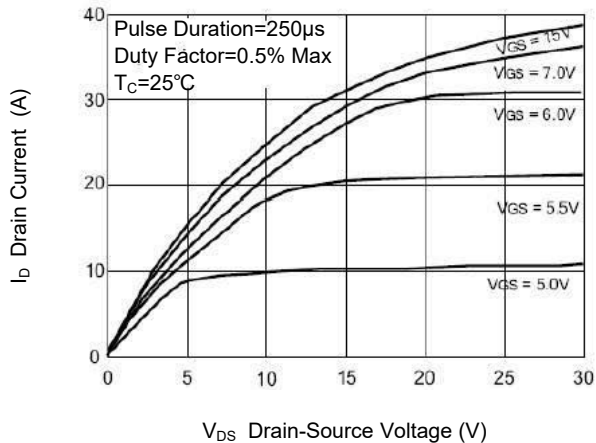
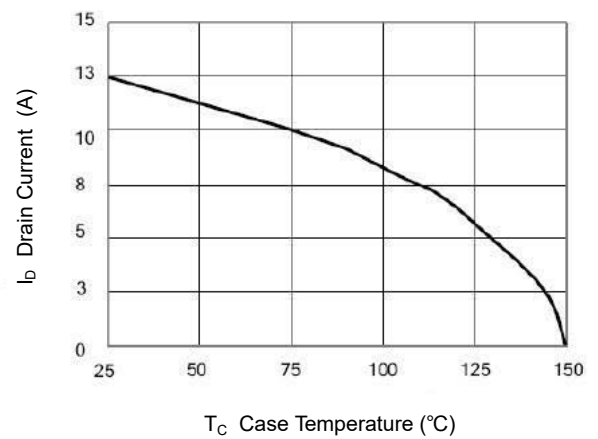
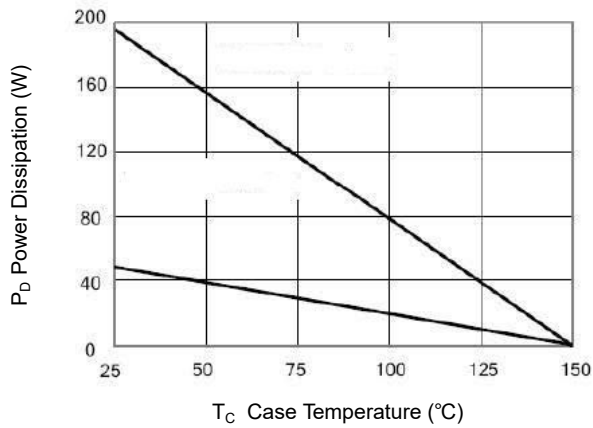
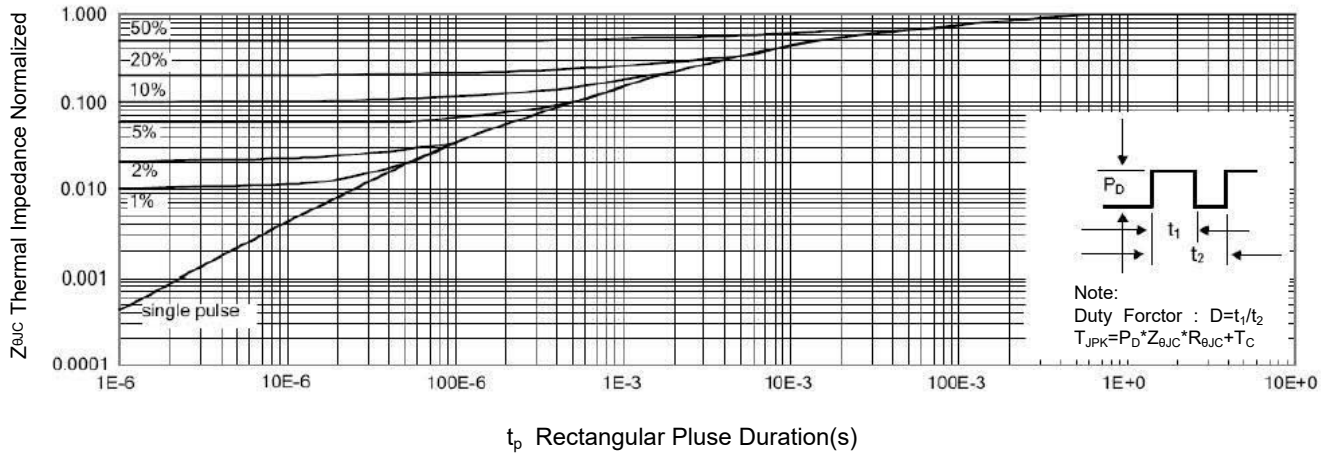
4. E_{AS} Condition: $L=10mH, I_D=13A$, start $T_J=25^\circ C$



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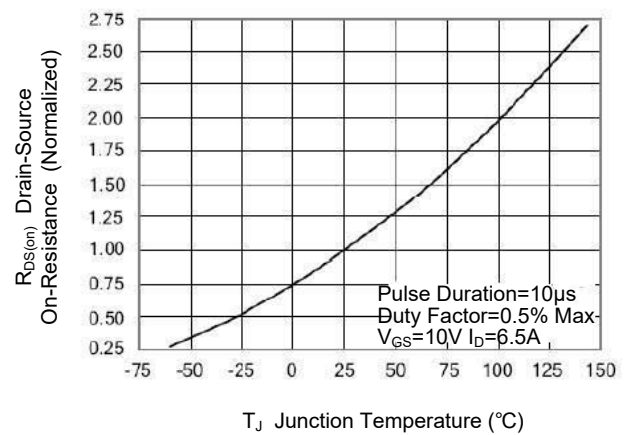
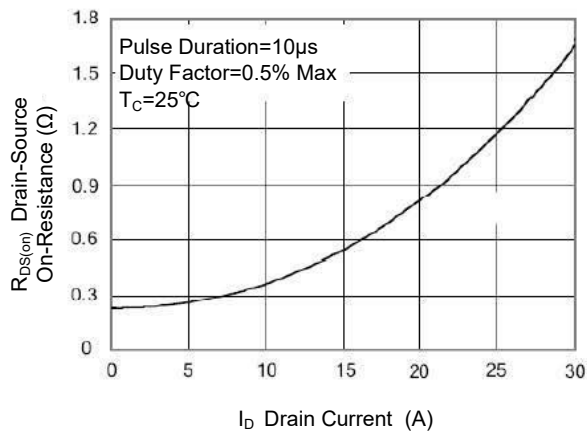
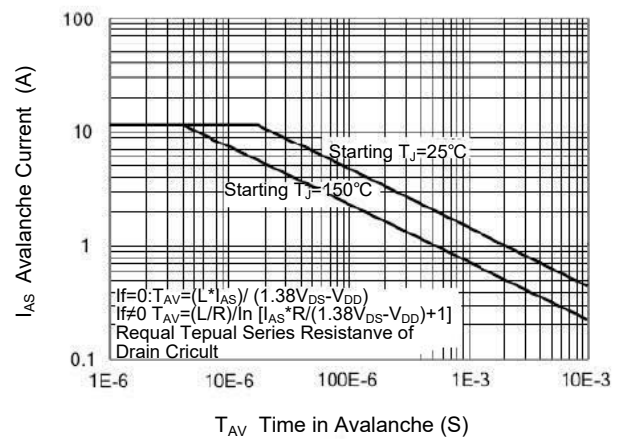
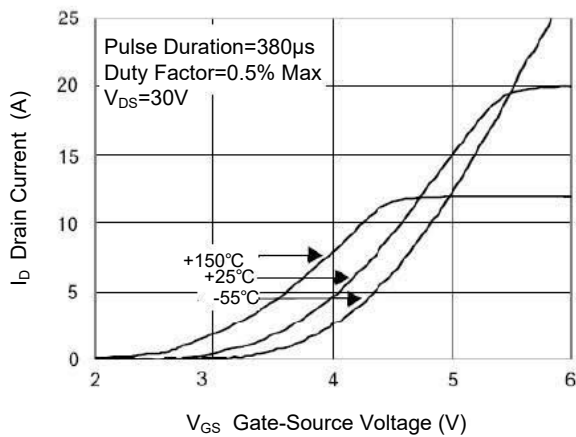
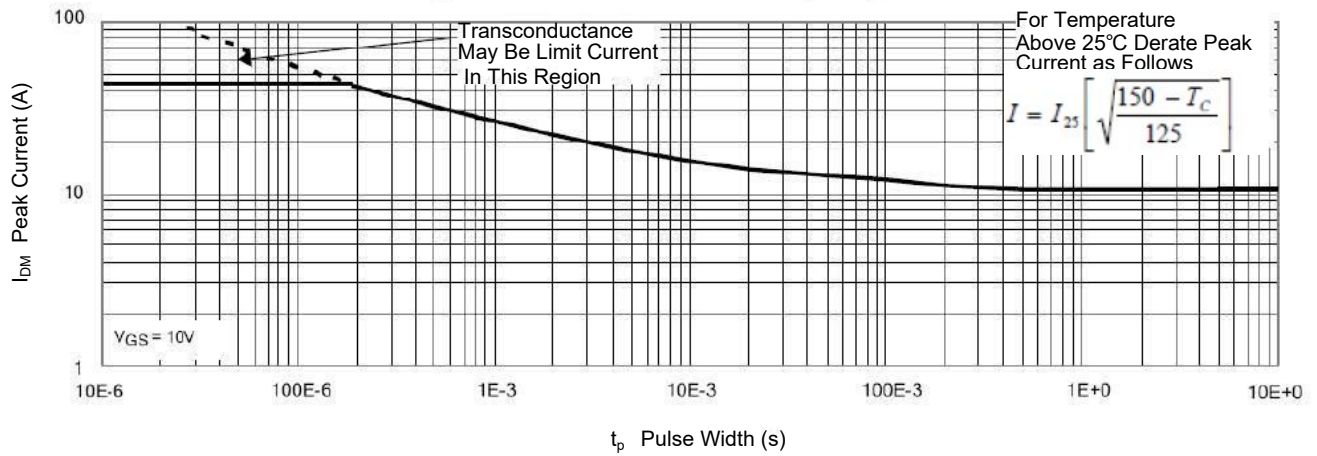
Typical Characteristic Curves





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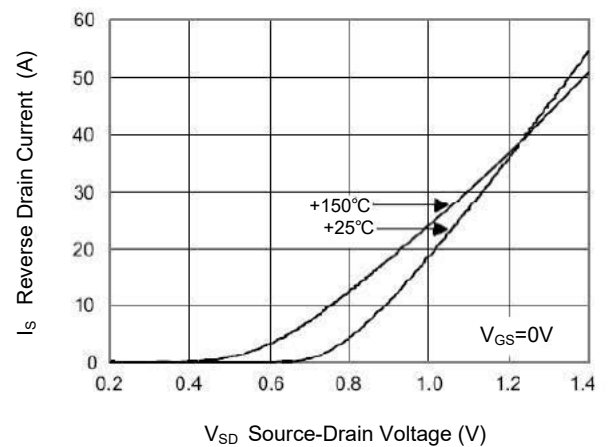
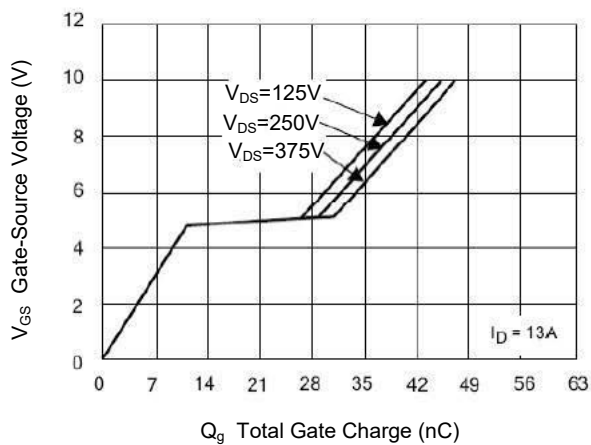
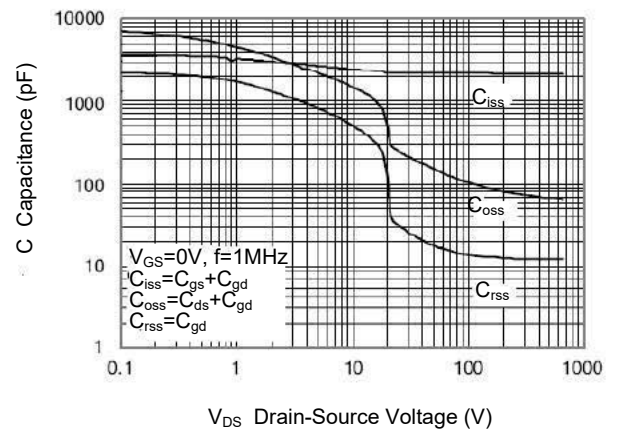
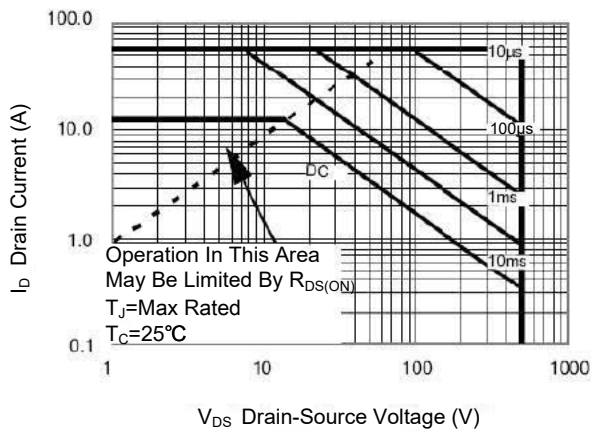
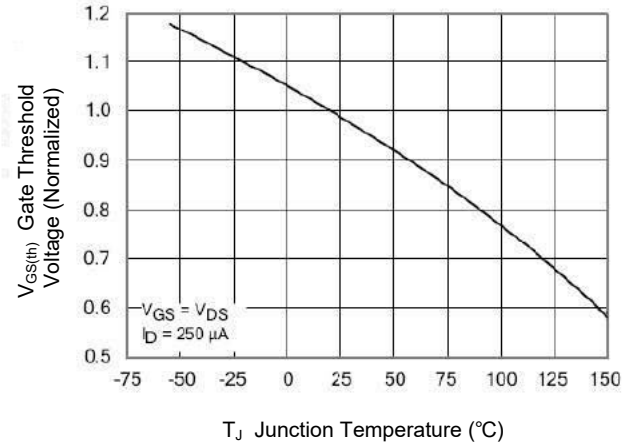
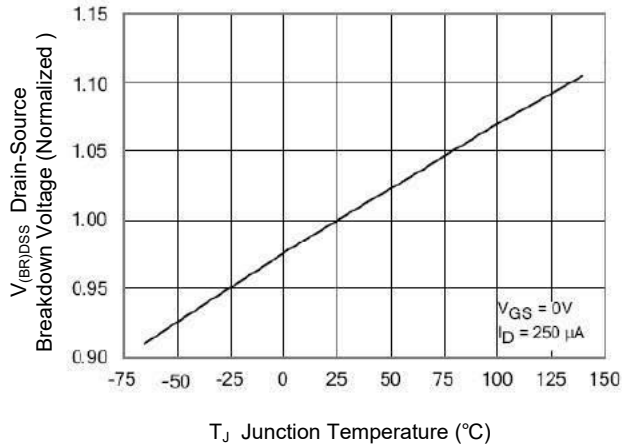
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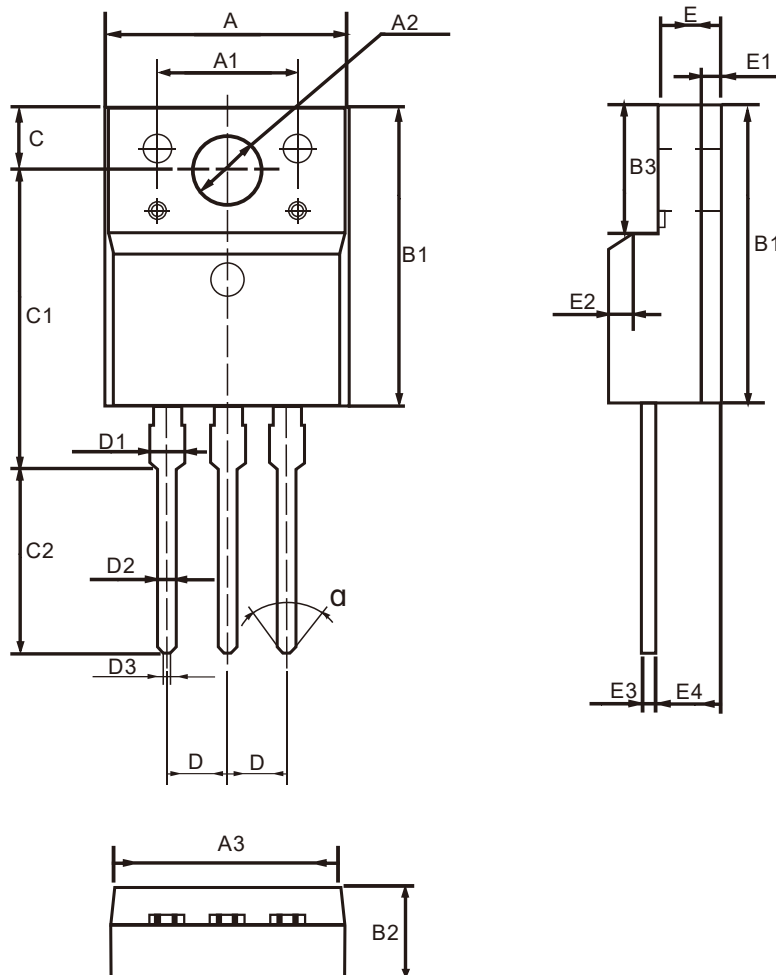
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Package Outline

TO-220F

Dimensions in mm



TO-220F Package Dimensions

UNIT : mm

SYMBOL	min	nom	max	SYMBOL	min	nom	max
A	9.80		10.60	D		2.54	
A1		7.00		D1	1.15		1.55
A2	2.90		3.40	D2	0.60		1.00
A3	9.10		9.90	D3	0.20		0.50
B1	15.40		16.40	E	2.24		2.84
B2	4.35		4.95	E1		0.70	
B3	6.00		7.40	E2		1.0 × 45°	
C	3.00		3.70	E3	0.35		0.65
C1	15.00		17.00	E4	2.30		3.30
C2	8.80		10.80	α (度)		30°	




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Contact Information

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For additional information, please contact your local Sales Representative.

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