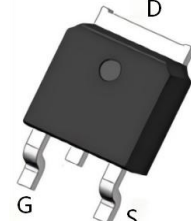
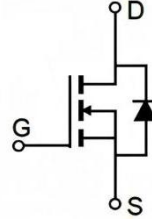


N-Channel Enhancement Mode MOSFET

Parameter	Value	Unit
V_{DS}	650	V
$R_{DS(on)}$	2.7	Ω
I_D	4.0	A



TO-252



TO-220F

Features

- Fast Switching Capability
- Avalanche Energy Specified
- Improved dv/dt Capability, High Ruggedness

Applications

- Switch Mode Power Supply(SMPS)
- Uninterruptible Power Supply(UPS)
- Power Factor Correction(PFC)

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	650	V
Gate Source Voltage		V_{GS}	± 30	V
Avalanche Current (Note ²)		I_{AR}	4.4	A
Continuous Drain Current		I_D	4.0	A
Pulsed Drain Current (Note ²)		I_{DM}	16	A
Avalanche Energy Single Pulsed (Note ³)		E_{AS}	260	mJ
Avalanche Energy Repetitive (Note ²)		E_{AR}	10.6	mJ
Power Dissipation (Note ¹)	TO-220F	P_D	35	W
	TO-252		50	W
Junction Temperature		T_J	125	$^{\circ}\text{C}$
Storage Temperature		T_{STG}	-55 to 150	$^{\circ}\text{C}$
Thermal Resistance from Junction to Ambient	TO-220F	$R_{\theta JA}$	62.5	$^{\circ}\text{C/W}$
	TO-252		110	
Thermal Resistance From Junction To Case	TO-220F	$R_{\theta JC}$	3.5	$^{\circ}\text{C/W}$
	TO-252		2.5	

Note:

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 maximum junction temperature.
3. $L=30\text{mH}$, $I_{AS}=4\text{A}$, $V_{DD}=50\text{V}$, $R_G=25\Omega$, Starting $T_J=25^{\circ}\text{C}$
4. $I_{SD}\leq 4.4\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD}\leq BVDSS$, Starting $T_J=25^{\circ}\text{C}$

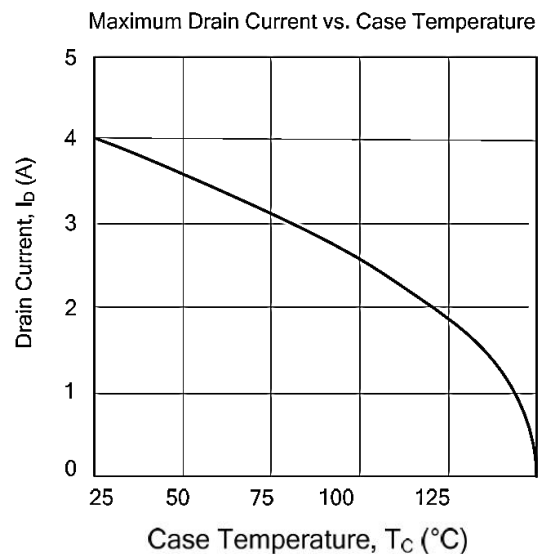
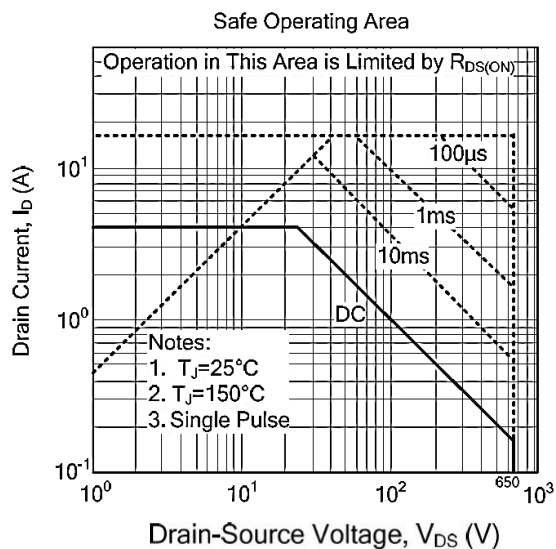
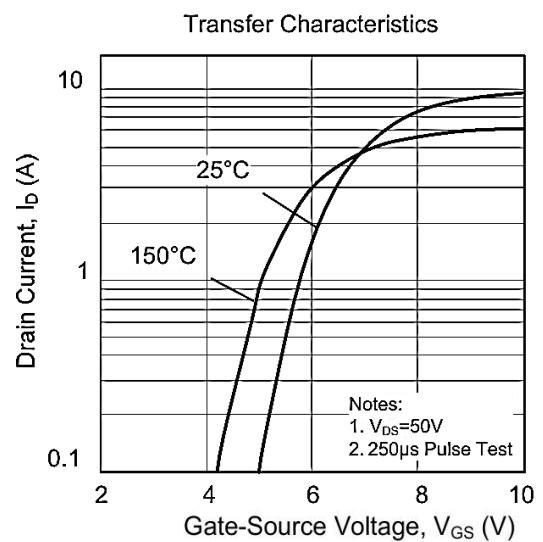
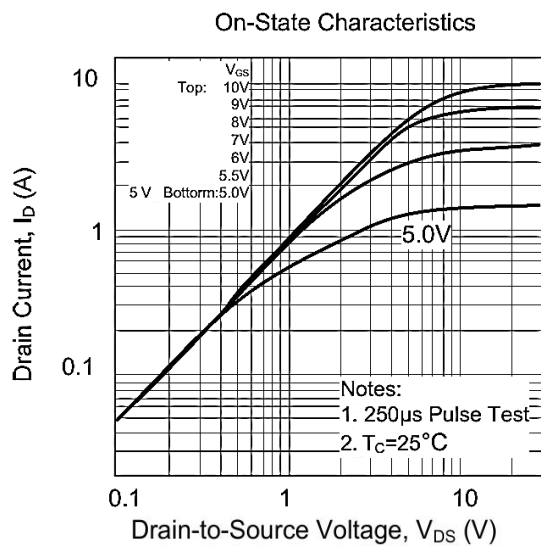
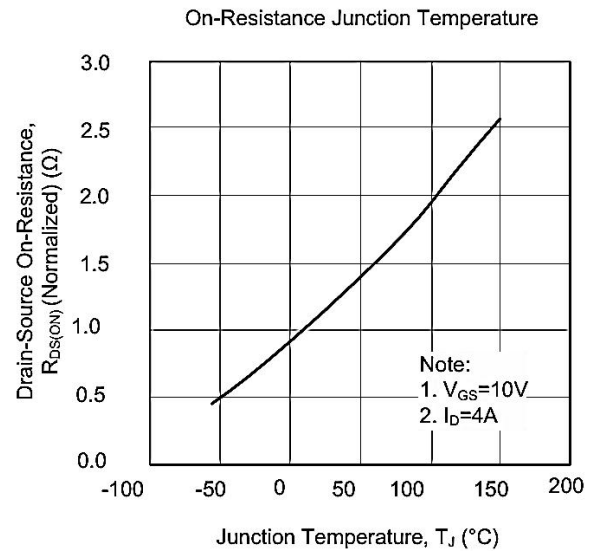
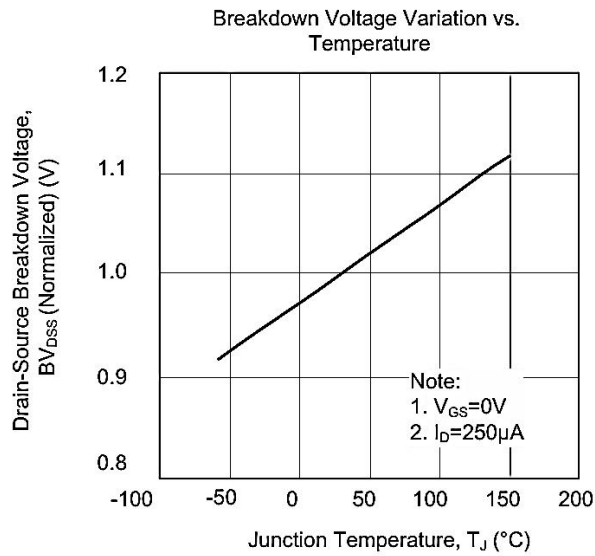
Electrical Characteristics(T_J=25°C, unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	650	--	--	V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =650V, V _{GS} =0V	--	--	10	μA
		V _{DS} =480V, T _C = 125℃	--	--	100	μA
Gate-Source Leakage Current	I _{GSS}	V _{GS} =±30V, V _{DS} =0V	--	--	±100	nA
Breakdown Voltage Temperature Coefficient	ΔB _{VDS} /ΔT _J	I _D =250μA Referenced to 25℃	--	0.6	--	V/℃
On Characteristics						
Drain-source on-state resistance	R _{DS(ON)}	V _{GS} =10V, I _D =3A	--	2.7	3	Ω
Gate Threshold Voltage	V _{GS(TH)}	V _{GS} =V _{DS} ,I _D =250μA	2.0	--	4.0	V
Dynamic Parameters						
Input Capacitance	C _{iss}	V _{GS} =0V,V _{DS} =25V, f=1.0MHz	--	670	750	pF
Output Capacitance	C _{oss}		--	70	90	
Reverse Transfer Capacitance	C _{rss}		--	23	26	
Switching Parameters						
Total gate charge	Q _g	V _{DS} =520V,V _{GS} =10V, I _D =4.0A (Note 1, 2)	--	100	120	nC
Gate-source charge	Q _{gs}		--	17	19	
Gate-drain charge	Q _{gd}		--	20	26	
Turn-On Delay Time	t _{d(on)}	V _{DD} =325V,R _G =25Ω , I _D =4.0A (Note 1, 2)	--	45	85	nS
Rise time	t _r		--	100	140	
Turn-Off Delay Time	t _{d(off)}		--	200	240	
Fall time	t _f		--	130	150	
Source- Drain Diode Ratings And Characteristics						
Continuous Drain-Source Current	I _S		--	--	4	A
Pulsed drain-source current	I _{SM}		--	--	17.6	A
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =4.4A	--	--	1.4	V
Reverse Recovery Time	t _{rr}	dIF/dt=100A/μs, I _S =4.4A	--	250	--	ns
Reverse Recovery Charge	Q _{rr}	V _{GS} =0V (Note 1)	--	1.5	--	μC

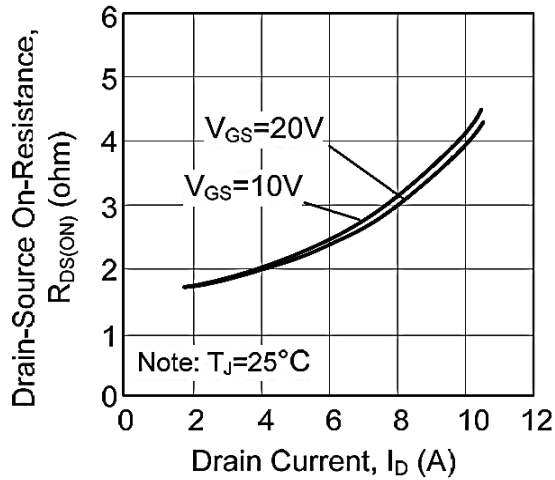
Notes:

1. Pulse Test : Pulse Width≤300μs, duty cycle≤2%.
2. Essentially independent of operating temperature.

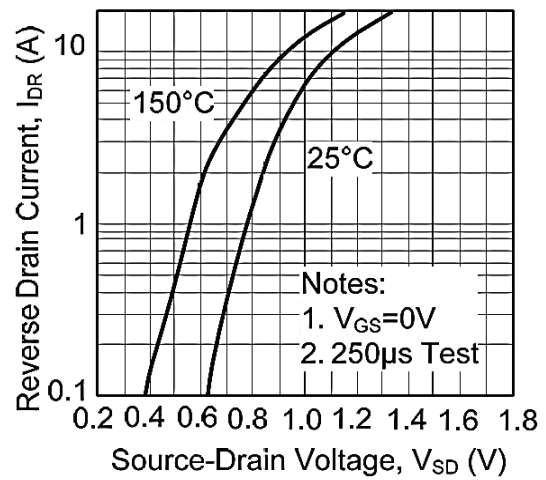
Typical Characteristics



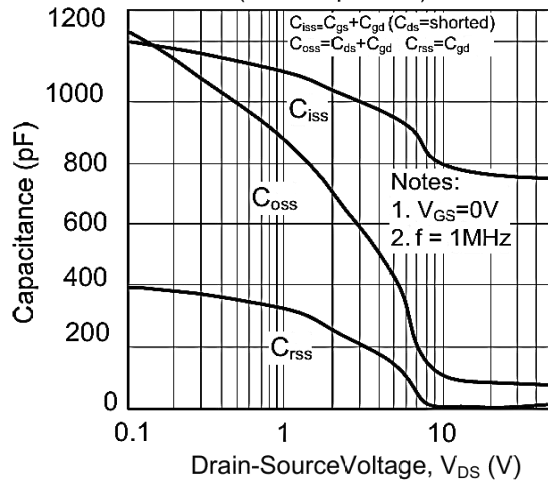
On-Resistance Variation vs. Drain Current and Gate Voltage



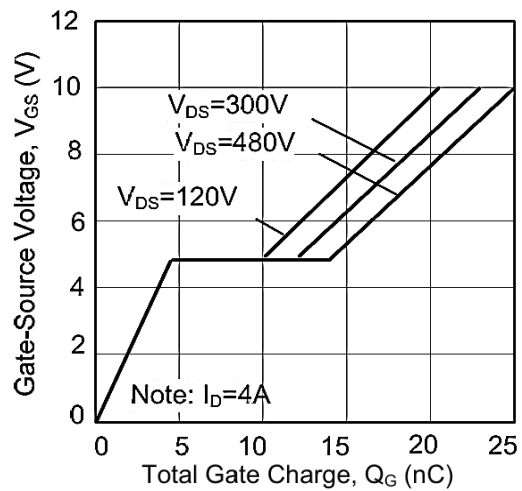
On State Current vs. Allowable Case Temperature



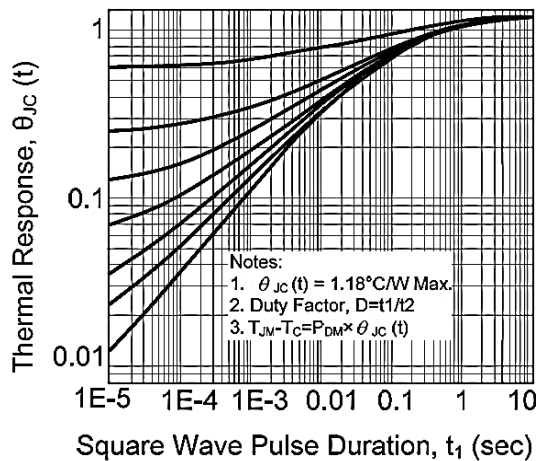
Capacitance Characteristics (Non-Repetitive)



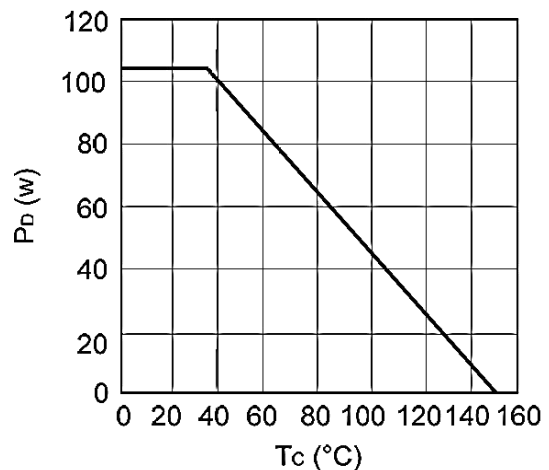
Gate Charge Characteristics



Transient Thermal Response Curve

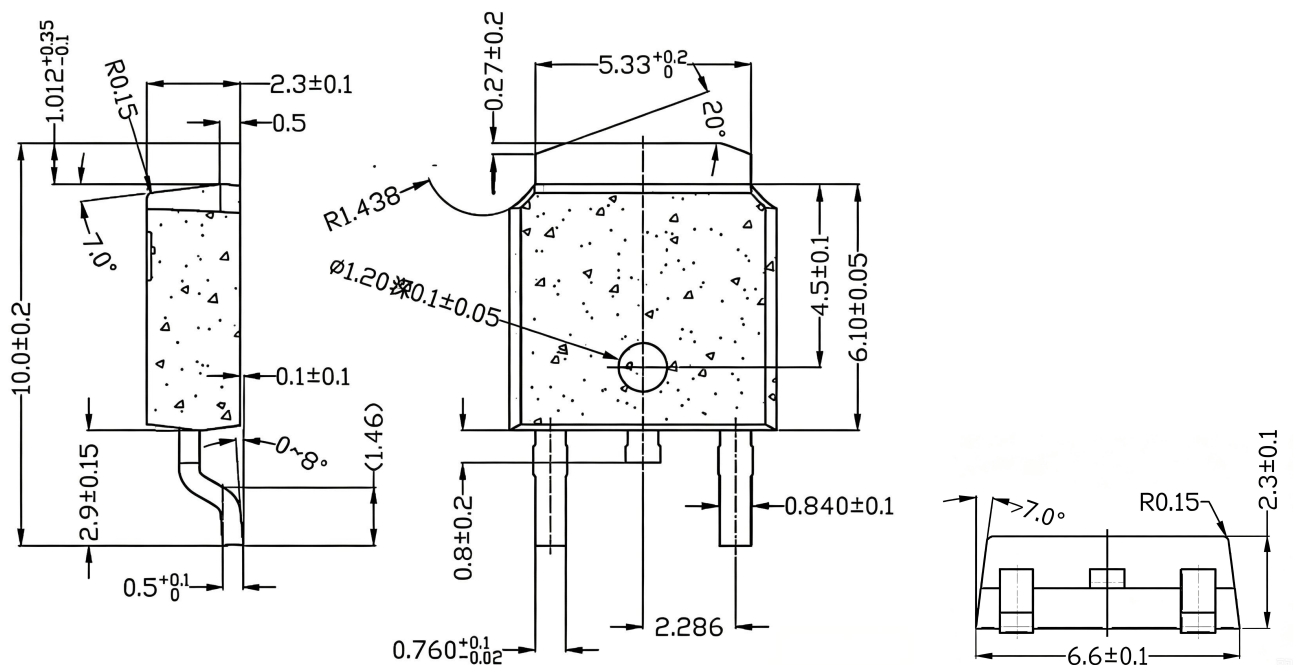


Power Dissipation

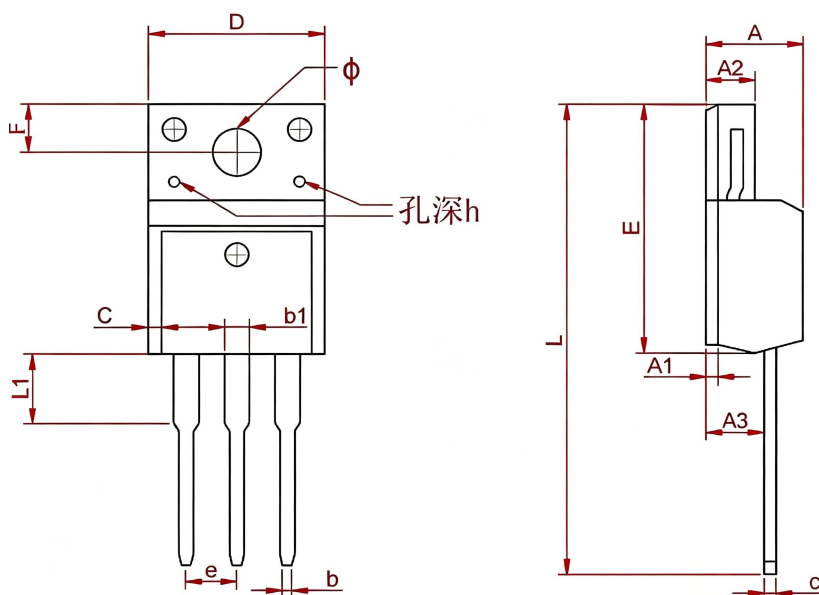


Package Outline

TO-252



TO-220F



Symbol	Dimensions In Millimeters	
	Min	Max
A	4.300	4.750
A1	0.7 REF	
A2	2.300	2.850
A3	2.500	2.900
b	0.380	0.420
b1	1.220	1.280
C	1.08	1.200
c	0.480	0.520
D	10.15	10.450
E	15.700	15.950
e	2.574 TYP	
F	3.470 REF	
y	3.200 REF	
h	0.000	0.800
L	28.780	28.900
L1	2.990	3.100

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