

**Features:**

7.0A, 650V,  $R_{DS(on)}(T) = 1.2 @ V_{GS}=10V$

Low Gate Charge

Low  $C_{oss}$

100% Avalanche T

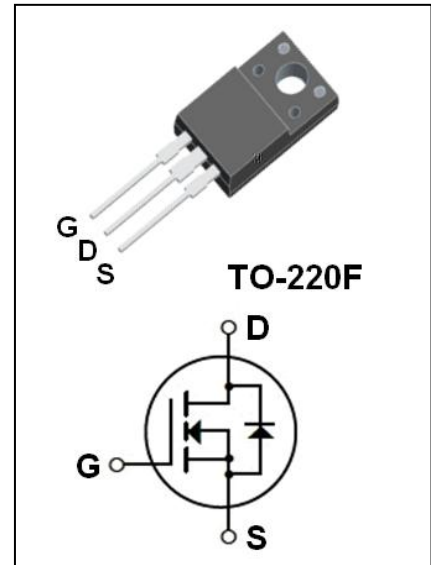
Fast

Low  $r_{DS(on)}$  /  $C_{iss}$

**Application:**

High Frequency Switching MOSFET

Automotive Power Electronics



**Absolute Maximum Ratings**( $T = 25^\circ C$ )

Symbol	Parameter	Value	Unit
$V_{DSS}$	Drain-Source Voltage	650	V
$I_D$	Drain Current (Continuous)	7.0* 4.5*	A
$I_{DM}$	Drain Current (Peak)	28*	A
$V_{GSS}$	Gate-Source Voltage	$\pm 30$	V
$E_{AS}$	Single Pulse Avalanche Energy	590	J
$I_{AR}$	Average Reverse Current	7.0	A
$E_{AR}$	Reverse Avalanche Energy	14.0	J
$r_{DS(on)}$	Drain-Source On-Resistance	4.5	$\Omega$
$P_D$	Power Dissipation	48 0.38	W W/ $^\circ C$
$T_J$	Operating Junction Temperature	150	$^\circ C$
$T_{STG}$	Storage Temperature Range	-55 ~ +150	$^\circ C$

\* Data in parentheses is limited by SOA and thermal characteristics.

**Thermal Characteristics**

Symbol	Parameter	Value	Unit
$R_{JC}$	Junction to Case Thermal Resistance	2.6	$^\circ C / W$
$R_{JA}$	Junction to Ambient Thermal Resistance	62.5	$^\circ C / W$

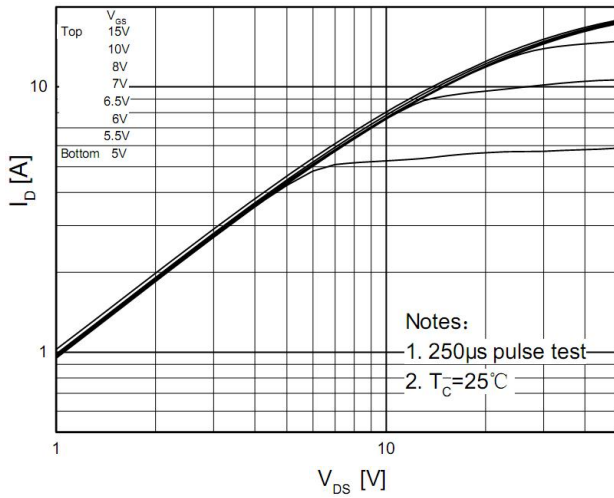
**Electrical Characteristics**(T =25°C )

S	Pa a	T C	M	T	Ma	U
<b>Off Characteristics</b>						
BV <sub>DSS</sub>	D a - B a V a	V <sub>GS</sub> =0V, I <sub>D</sub> =250 A	650	--	--	V
ΔBV <sub>DSS</sub> / ΔT <sub>J</sub>	B a V a T a	I <sub>D</sub> =250 A (R 25°C)	--	0.7	--	V/°C
I <sub>DSS</sub>	Z Ga V a D a C	V <sub>DS</sub> =650V, V <sub>GS</sub> =0V	--	--	1	A
		V <sub>DS</sub> =520V, T =125°C	--	--	10	A
I <sub>GSSF</sub>	Ga -B L a a C ,F a	V <sub>GS</sub> =+30V, V <sub>DS</sub> =0V	--	--	100	A
I <sub>GSSR</sub>	Ga -B L a a C ,R	V <sub>GS</sub> =-30V, V <sub>DS</sub> =0V	--	--	-100	A
<b>On Characteristics</b>						
V <sub>GS( )</sub>	Ga T V a	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> =250 A	2.0	--	4.0	V
R <sub>DS( )</sub>	S a D a -S O -R a	V <sub>GS</sub> =10 V, I <sub>D</sub> =3.5A	--	1.2	1.4	
f <sub>FS</sub>	F a T a a	V <sub>DS</sub> =40 V, I <sub>D</sub> =3.5A (N 4)	--	6.5	--	S
<b>Dynamic Characteristics</b>						
C	I Ca a a	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, =1.0MH	--	1380	--	F
C	O Ca a a		--	170	--	F
C	R T a Ca a a		--	15	--	F
<b>Switching Characteristics</b>						
( )	T -O D a T	V <sub>DD</sub> = 325 V, I <sub>D</sub> = 7.0 A, R <sub>G</sub> = 25 (N 4,5)	--	13	--	
	T -O R T		--	100	--	
( )	T -O D a T		--	126	--	
	T -O Fa T		--	48	--	
Q	T a Ga C a	V <sub>DS</sub> = 520 V, I <sub>D</sub> =7.0 A, V <sub>GS</sub> = 10 V (N 4,5)	--	30	--	C
Q	Ga -S C a		--	6	--	C
Q	Ga -D a C a		--	14	--	C
<b>Drain-Source Diode Characteristics and Maximum Ratings</b>						
I <sub>S</sub>	Ma C D a -S D F a C		--	--	7.0	A
I <sub>SM</sub>	Ma P D a -S D F a C		--	--	28	A
V <sub>SD</sub>	D a -S D F a V a	V <sub>GS</sub> =0V, I <sub>S</sub> =7.0A	--	--	1.4	V
	R R T	V <sub>GS</sub> =0V, I <sub>S</sub> =7.0A, I <sub>F</sub> / =100A/ (N 4)	--	315	--	
Q	R R C a		--	2.6	--	C

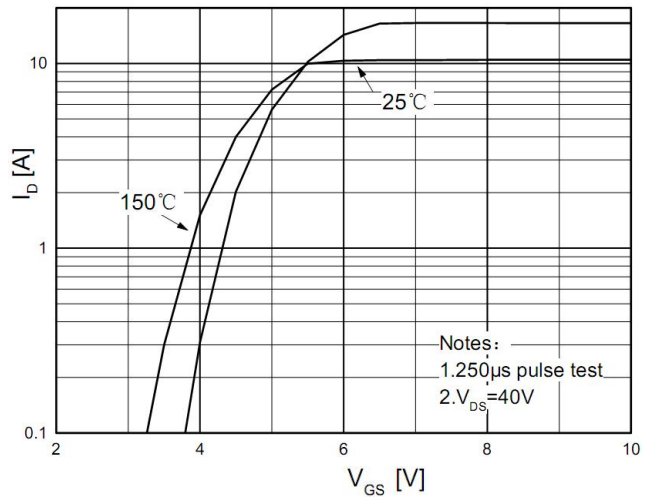
N :

- 1、R Ra :P W L Ma J T a .
- 2、L = 19.5 H, I<sub>AS</sub> =7.0A, V<sub>DD</sub> = 50V, R<sub>G</sub> = 25 , S a T<sub>J</sub> = 25°C.
- 3、I<sub>SD</sub> 7.0A, / 200A/ , V<sub>DD</sub> BV<sub>DSS</sub>, S a T<sub>J</sub> = 25°C.
- 4、P T :P W 300 ,D C 2%.
- 5、E a l O a T a .

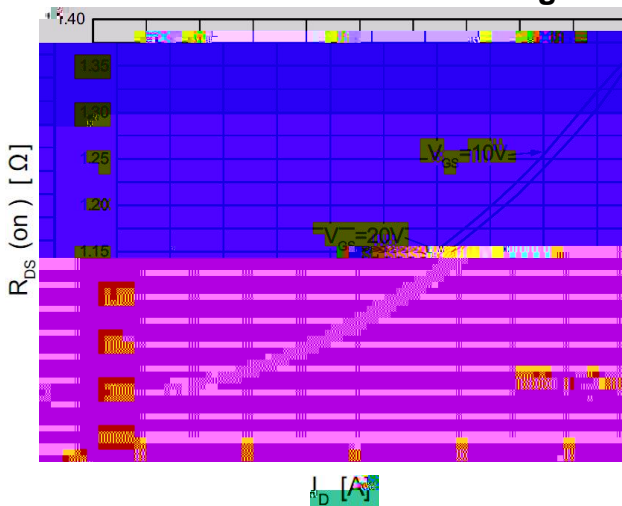
### On-Regin Characteristics



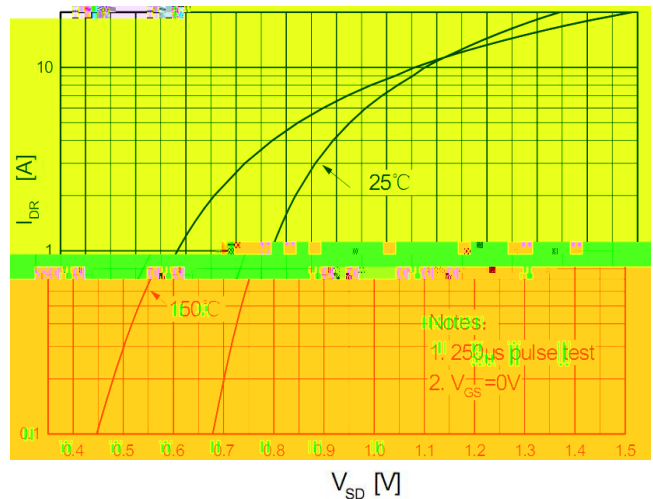
### Transfer Characteristics



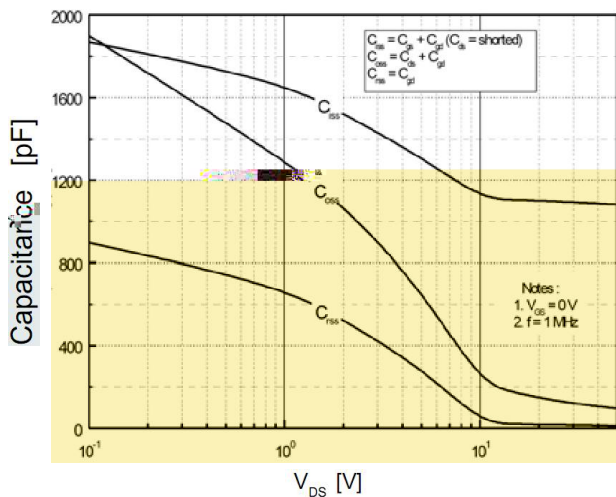
### On-Resistance Variation vs. Drain Current and Gate Voltage



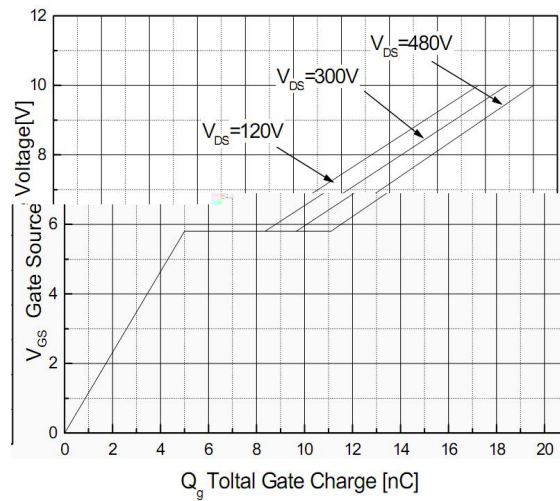
### Body Diode Forward Voltage Variation vs. Source Current and Temperature



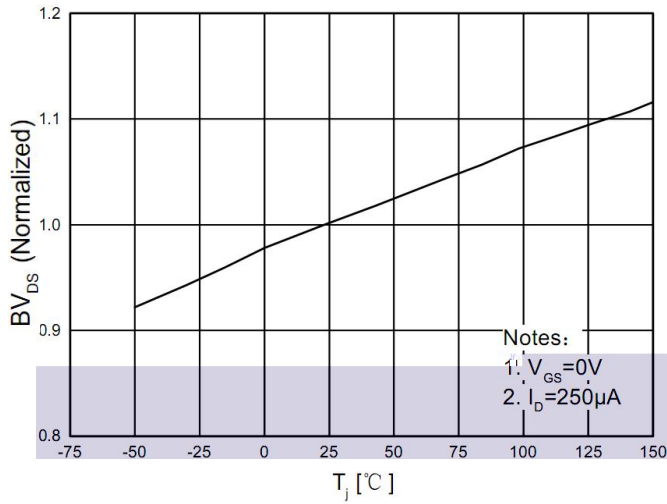
### Capacitance Characteristics



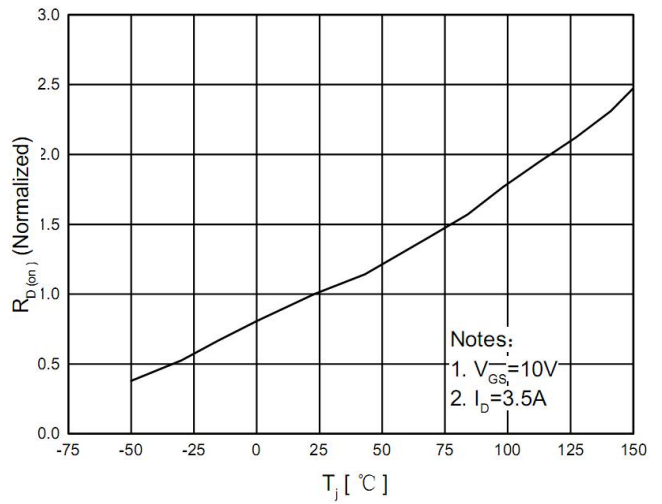
### Gate Charge Characteristics



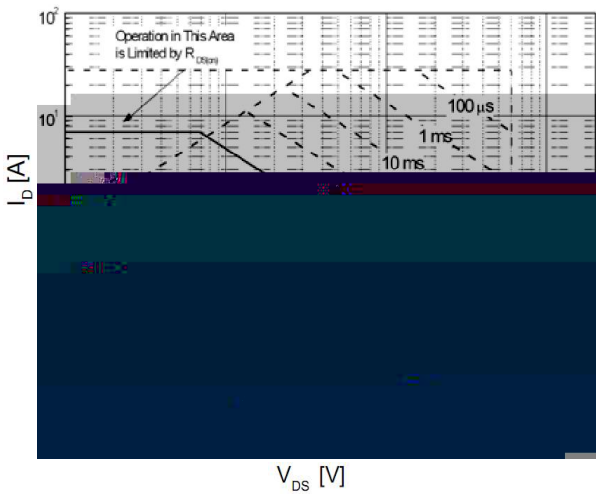
**Breakdown Voltage Variation vs. Temperature**



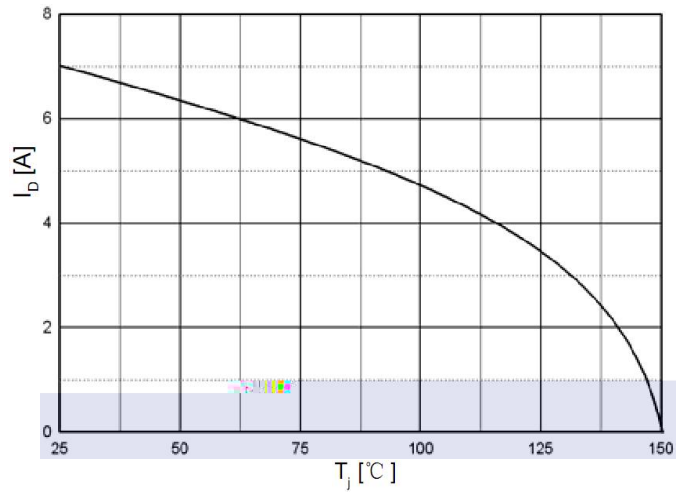
**On-Resistance Variation vs. Temperature**



**Maximum Safe Operating Area**



**Maximum Drain Current Vs. Case Temperature**



## TO-220F Package Dimensions

UNIT:

SYMBOL			a	SYMBOL		a
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			30°

