

Features :

8.0A, 650V, $R_{DS(on)(Typ)} = 1.1\Omega @ V_{GS}=10V$

Low Gate Charge

Low C_{rss}

100% Avalanche Tested

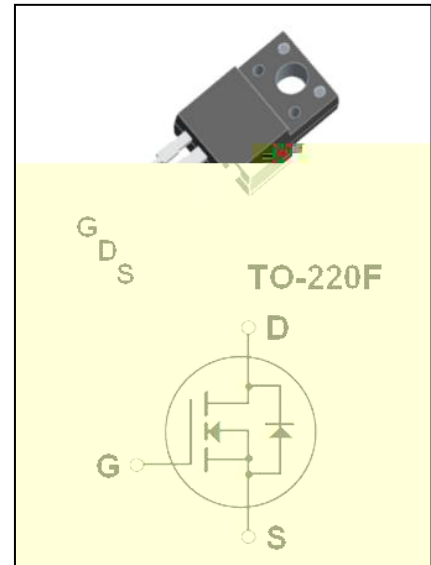
Fast Switching

Improved dv/dt Capability

Applications :

High Frequency Switching Mode Power Supply

Active Power Factor Correction



Absolute Maximum Rating (Tc=25°C unless otherwise noted)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage	650	V
I_D	Drain Current - Continuous(Tc=25°C) - Continuous(Tc=100°C)	8.0*	A
		5.1*	A
I_{DM}	Drain Current -Pulsed (Note1)	32*	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Single Pulsed Avalanche Energy (Note2)	600	mJ
I_{AR}	Avalanche Current (Note1)	8.0	A
E_{AR}	Repetitive Avalanche Energy (Note1)	15.0	mJ
dv/dt	Peak Diode Recovery dv/dt (Note3)	4.5	V/ns
P_D	Power Dissipation(Tc =25°C) -Derate above 25°C	51	W
		0.41	W/°C
T_j	Operating Junction Temperature	150	°C
T_{stg}	Storage Temperature Range	-55 to+150	°C

* Drain Current Limited by Maximum Junction Temperature.

Thermal Characteristics

Symbol	Parameter	Max	Unit
$R_{\theta JC}$	Thermal Resistance,Junction to Case	2.44	°C /W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62.5	°C /W

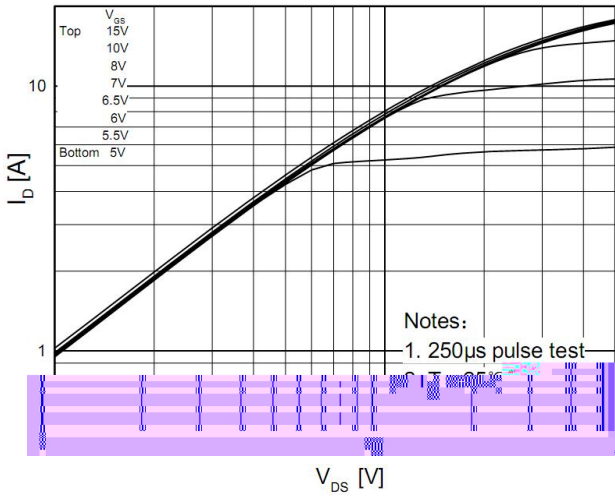
Electrical Characteristics (Tc=25°C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Off Characteristics						
BV_{DSS}	Drain-source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	650	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	Breakdown Voltage Temperature Coefficient	$I_D=250\mu A$ (Referenced to 25°C)	--	0.7	--	V/°C
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=650V, V_{GS}=0V$	--	--	1	μA
		$V_{DS}=520V, T_c=125^\circ C$	--	--	10	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS}=+30V, V_{DS}=0V$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS}=-30V, V_{DS}=0V$	--	--	-100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	2.0	--	4.0	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS}=10V, I_D=4.0A$	--	1.1	1.3	Ω
g_{FS}	Forward Transconductance	$V_{DS}=40V, I_D=4.0A$ (Note4)	--	7	--	S
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=25V, V_{GS}=0V,$ $f=1.0MHz$	--	1400	--	pF
C_{oss}	Output Capacitance		--	175	--	pF
C_{rss}	Reverse Transfer Capacitance		--	16	--	pF
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 325V, I_D = 8.0A,$ $R_G = 25\Omega$ (Note4,5)	--	13.5	--	ns
t_r	Turn-On Rise Time		--	105	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	128	--	ns
t_f	Turn-Off Fall Time		--	49	--	ns
Q_g	Total Gate Charge		--	31	--	nC
Q_{gs}	Gate-Source Charge	$V_{DS} = 520V, I_D = 8.0A,$ $V_{GS} = 10V$ (Note4,5)	--	6.5	--	nC
Q_{gd}	Gate-Drain Charge		--	14.7	--	nC
Diode Characteristics and Maximum Rating						
I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	8.0	--	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	32	--	A
V_{SD}	Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 8.0A$	--	--	1.4	V
t_{rr}	Reverse Recovery Time	$V_{GS} = 0V, I_S = 8.0A,$ $dI_F/dt = 100A/\mu s$ (Note4)	--	325	--	ns
Q_{rr}	Reverse Recovery Charge		--	2.7	--	μC

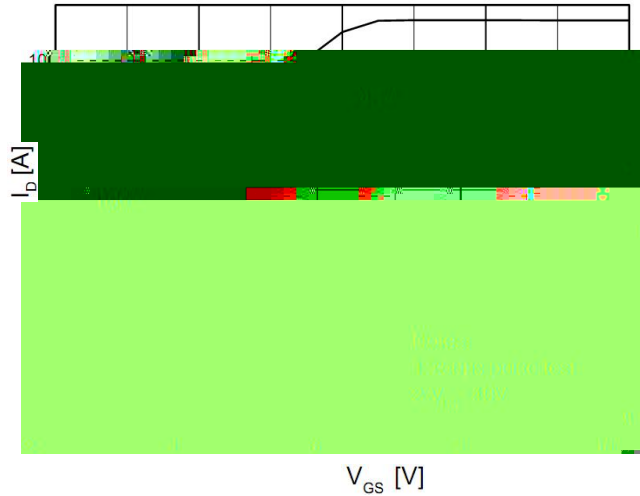
Notes:

- 1、Repetitive Rating:Pulse Width Limited by Maximum Junction Temperature.
- 2、L = 18.5mH, $I_{AS} = 8.0A$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = 25^\circ C$.
- 3、 $I_{SD} \leq 8.0A$, $di/dt \leq 200A/\mu s$, $V_{DD} \leq BV_{DSS}$, Starting $T_J = 25^\circ C$.
- 4、Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
- 5、Essentially Independent of Operating Temperature.

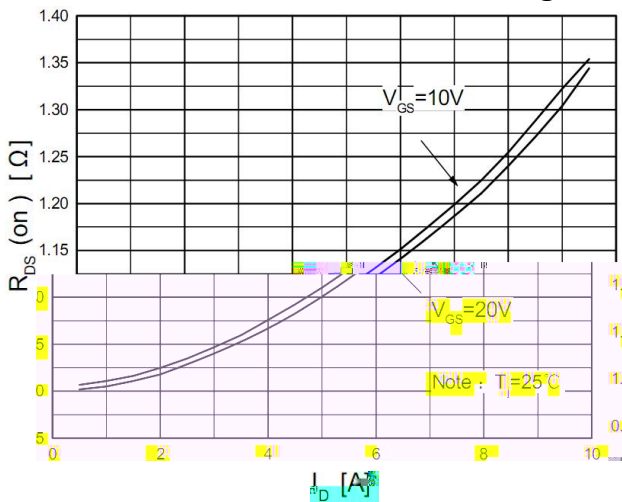
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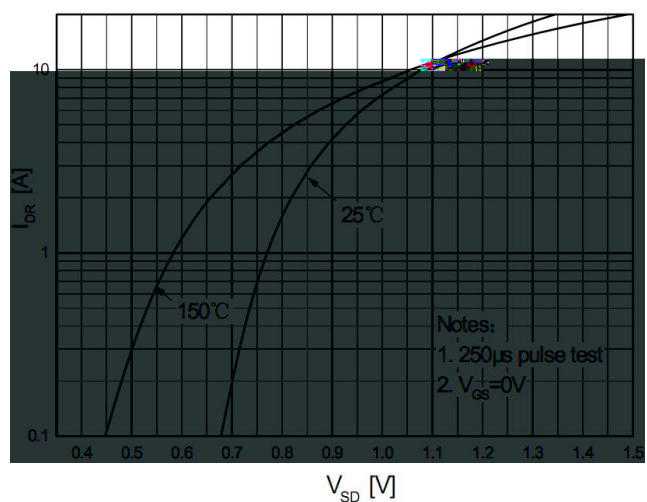
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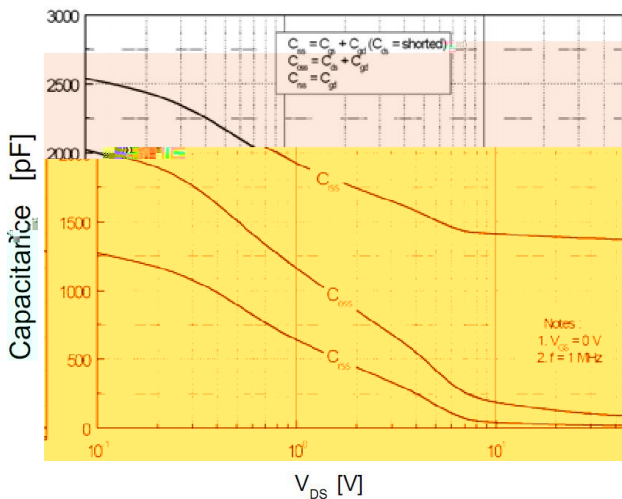
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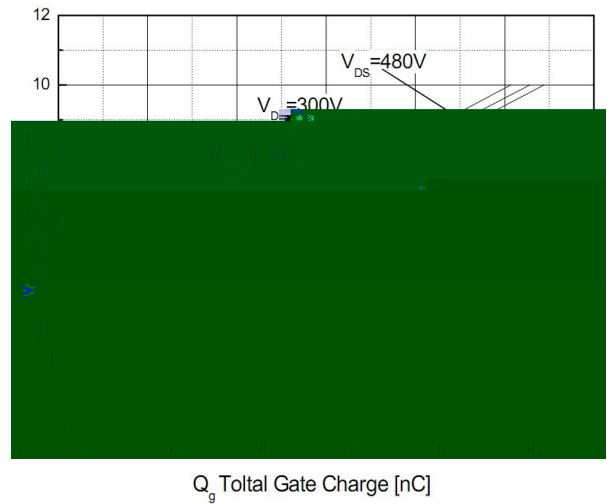
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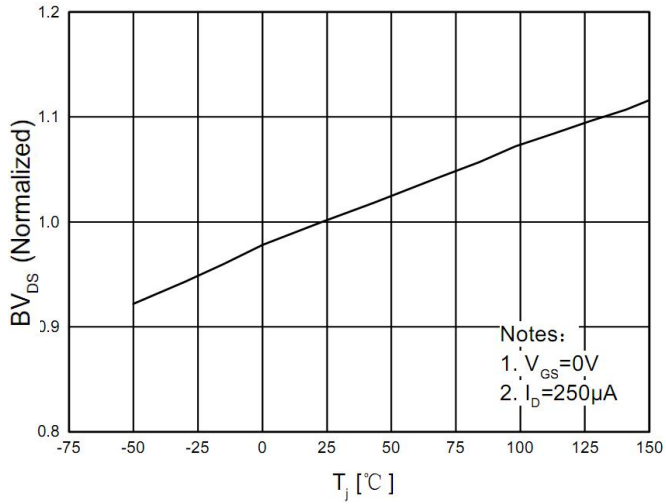
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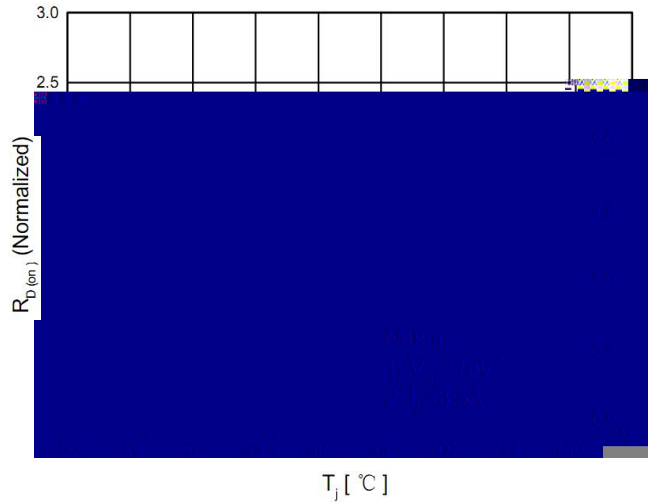
G a e Cha g e Cha ac e i ic



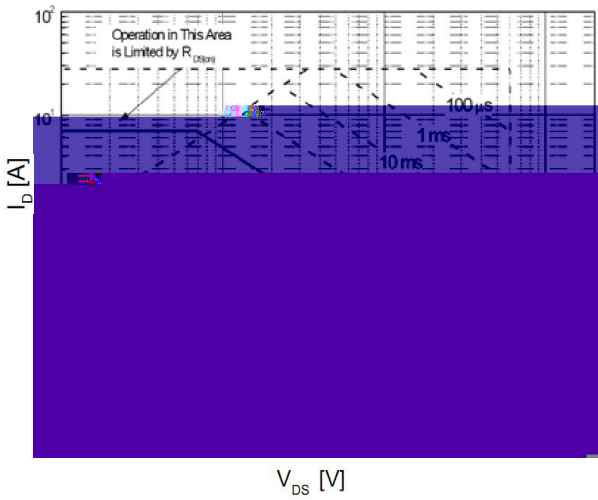
Breakdown Voltage vs. Temperature



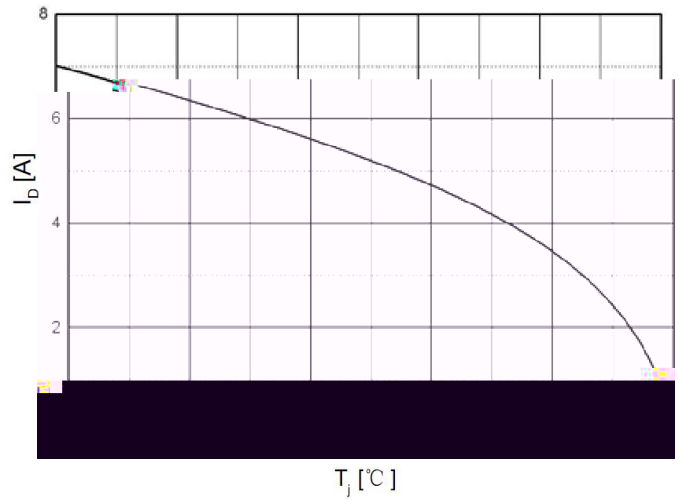
On-Resistance vs. Temperature



Maximum Safe Operating Area



Maximum Drain Current vs. Temperature



TO-220F Package Dime i

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		30°	

