

Features:

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

Low Gate Charge

Low C_{oss}

100% Avalanche T

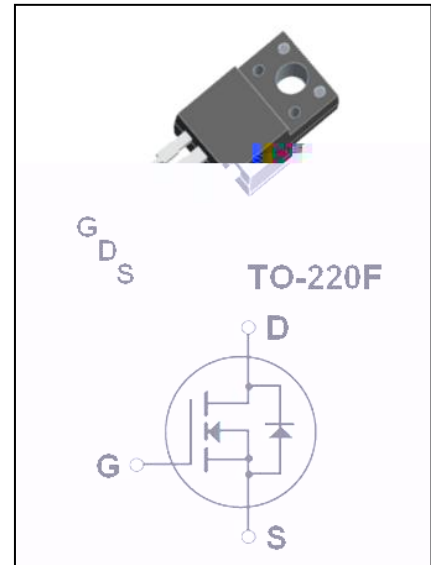
Fast

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

Applications:

High Frequency Switching MOSFET

Automotive Power Conversion



Absolute Maximum Ratings (T_c = 25°C)

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-Source Voltage (I _D = 0)	650	V
I_D	Drain Current (Continuous, T _c = 25°C)	8.0*	A
		5.1*	A
I_{DM}	Drain Current (Pulse)	32*	A
V_{GSS}	Gate-Source Voltage	±30	V
E_{AS}	Switching Energy (N = 1)	600	J
I_{AR}	Average Rectifier Current (N = 1)	8.0	A
E_{AR}	Reverse Avalanche Energy (N = 1)	15.0	J
$r_{DS(on)}$	Drain-Source Resistance (N = 3)	4.5	mΩ
P_D	Power Dissipation (T _c = 25°C)	51	W
		0.41	W/°C
T_J	Operating Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-55 ~ +150	°C

* Data in parentheses is limited by SOA and SOG.

Thermal Characteristics

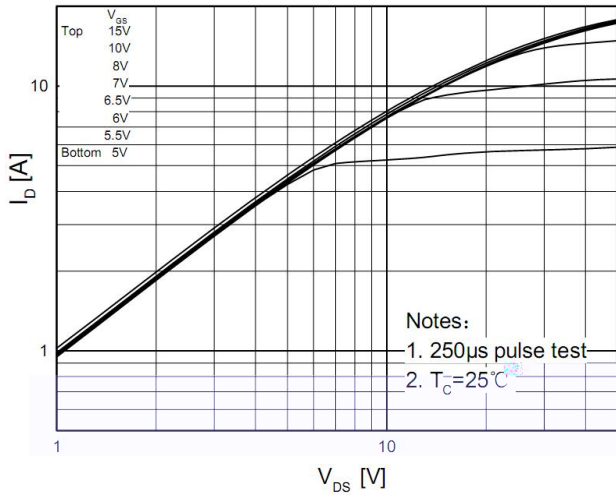
Symbol	Parameter	Value	Unit
R_{JC} <td>Junction to Case Thermal Resistance</td> <td>2.44</td> <td>°C/W</td>	Junction to Case Thermal Resistance	2.44	°C/W
R_{JA} <td>Junction to Ambient Thermal Resistance</td> <td>62.5</td> <td>°C/W</td>	Junction to Ambient Thermal Resistance	62.5	°C/W

Electrical Characteristics (T_J = 25°C)

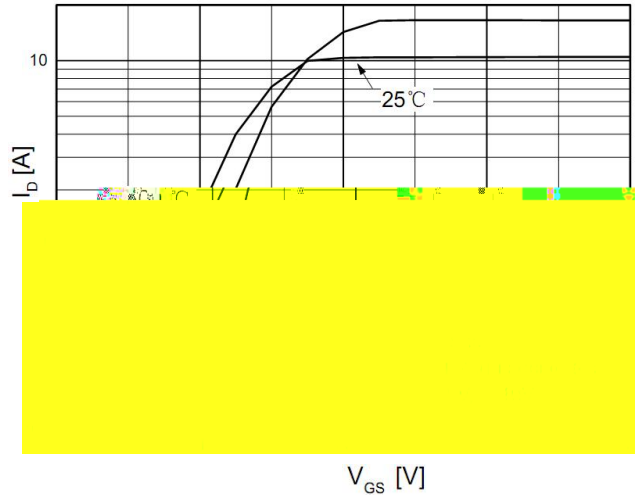
S	Parameter	Test Condition	M	T	Max	Unit
Off Characteristics						
BV _{DSS}	Drain-Body Voltage	V _{GS} =0V, I _D =250 A	650	--	--	V
ΔBV _{DSS} / ΔT _J	Drain-Body Voltage Temperature Coefficient	I _D =250 A (R _{θJC} = 25°C)	--	0.7	--	V/°C
I _{DSS}	Zener Voltage	V _{DS} =650V, V _{GS} =0V	--	--	1	A
		V _{DS} =520V, T _J =125°C	--	--	10	A
I _{GSSF}	Gate-Body Leakage Current, Forward	V _{GS} =+30V, V _{DS} =0V	--	--	100	A
I _{GSSR}	Gate-Body Leakage Current, Reverse	V _{GS} =-30V, V _{DS} =0V	--	--	-100	A
On Characteristics						
V _{GS(on)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250 A	2.0	--	4.0	V
R _{DS(on)}	Source-Drain On-Resistance	V _{GS} =10V, I _D =4.0A	--	1.1	1.3	
f _{FS}	Fall Time	V _{DS} =40V, I _D =4.0A (N ₄)	--	7	--	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, =1.0MH	--	1400	--	F
C _{oss}	Output Capacitance		--	175	--	F
C _{rss}	Reverse Transfer Capacitance		--	16	--	F
Switching Characteristics						
t _{TO}	Turn-On Delay Time	V _{DD} = 325V, I _D = 8.0A, R _G = 25 (N _{4,5})	--	13.5	--	
t _{TR}	Turn-On Rise Time		--	105	--	
t _{TO}	Turn-Off Delay Time		--	128	--	
t _{TF}	Turn-Off Fall Time		--	49	--	
Q _g	Gate Charge	V _{DS} = 520V, I _D = 8.0A, V _{GS} = 10V (N _{4,5})	--	31	--	C
Q _g	Gate Charge (Slope)		--	6.5	--	C
Q _g	Gate Charge (Flat)		--	14.7	--	C
Thermal and Mechanical Ratings						
I _S	Maximum Source Current	D _F = 8.0A	--	--	8.0	A
I _{SM}	Maximum Pulsed Source Current	D _F = 8.0A	--	--	32	A
V _{SD}	Source-Drain Voltage	V _{GS} = 0V, I _S = 8.0A	--	--	1.4	V
Q _g	Gate Charge	V _{GS} = 0V, I _S = 8.0A,	--	325	--	
		I _F / = 100A/ (N ₄)	--	2.7	--	C

- Notes:
- R_{θJA}: Power Dissipation Coefficient, Maximum Junction Temperature.
 - L = 18.5 H, I_{AS} = 8.0A, V_{DD} = 50V, R_G = 25 Ω, S_{max} = 25°C.
 - I_{SD} 8.0A, I_F 200A/ , V_{DD} BV_{DSS}, S_{max} = 25°C.
 - P_T: Power Dissipation, Duty Cycle 2%.
 - Electrical Characteristics are typical values.

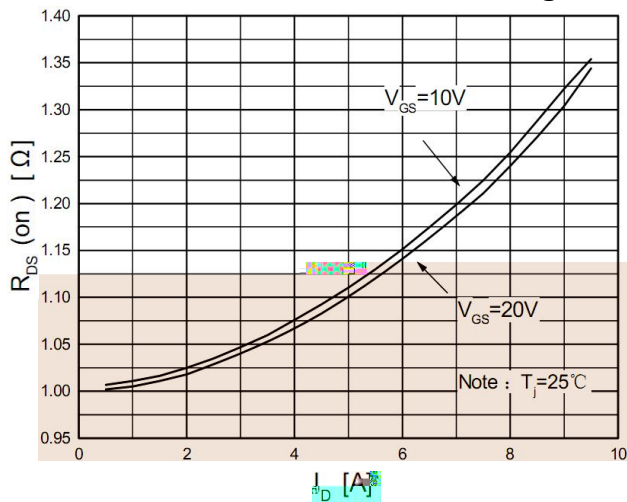
O -Regi Cha ac e i ic



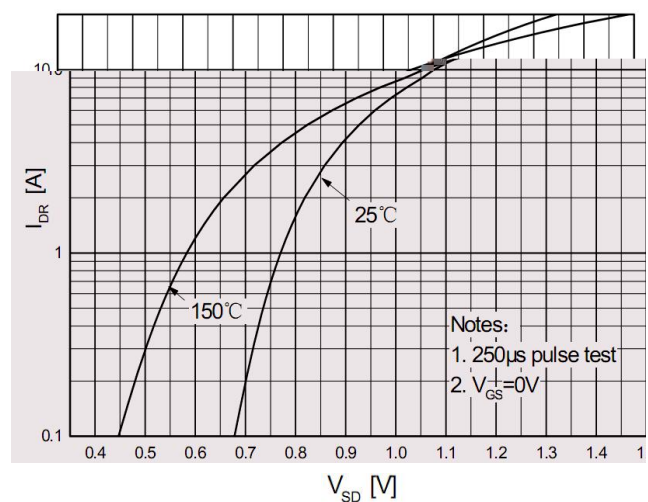
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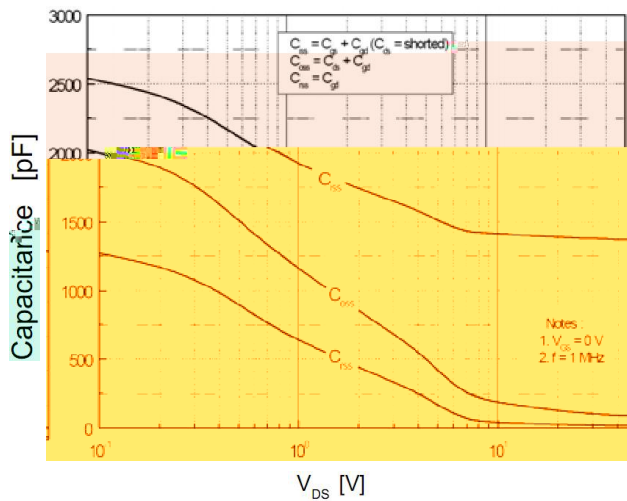
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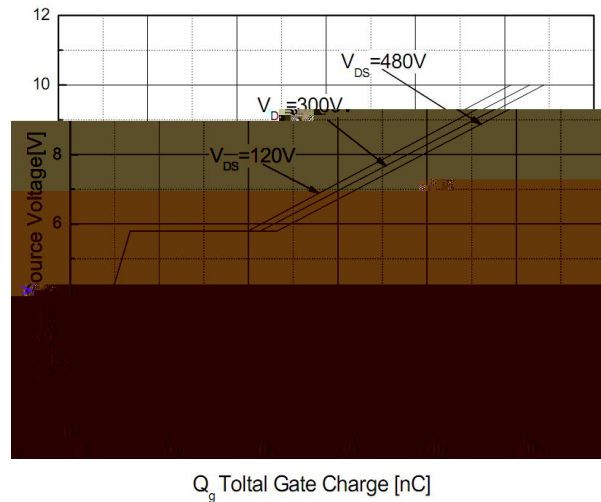
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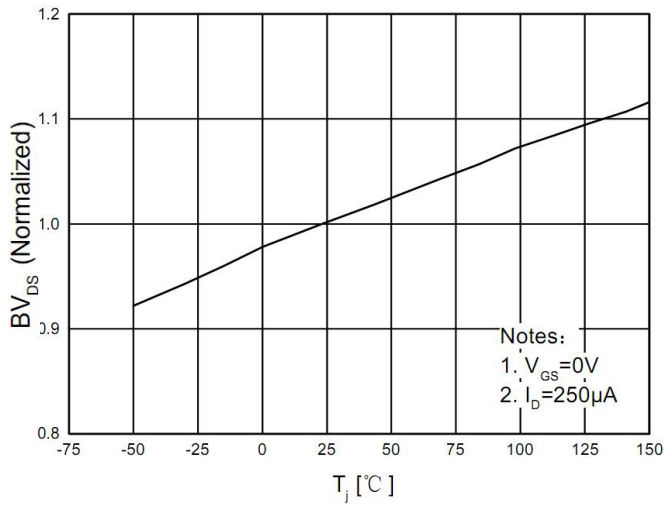
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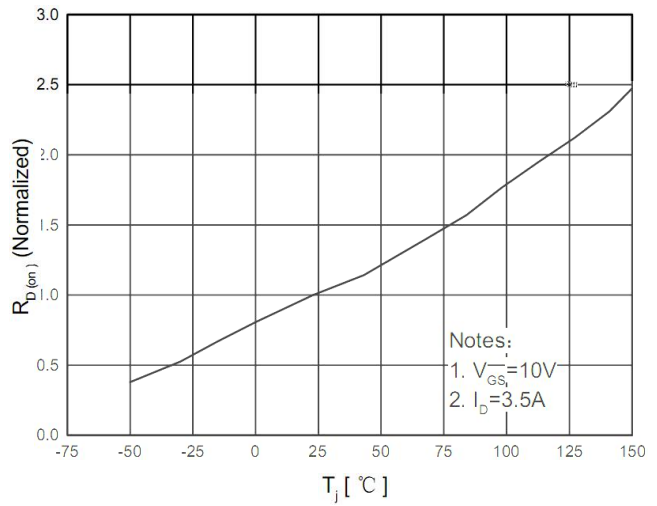
Ga e Cha ge Cha ac e i ic



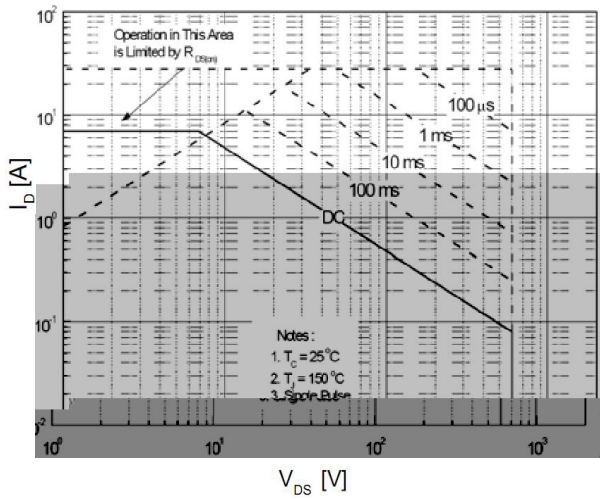
Breakdown Voltage Variation with Temperature



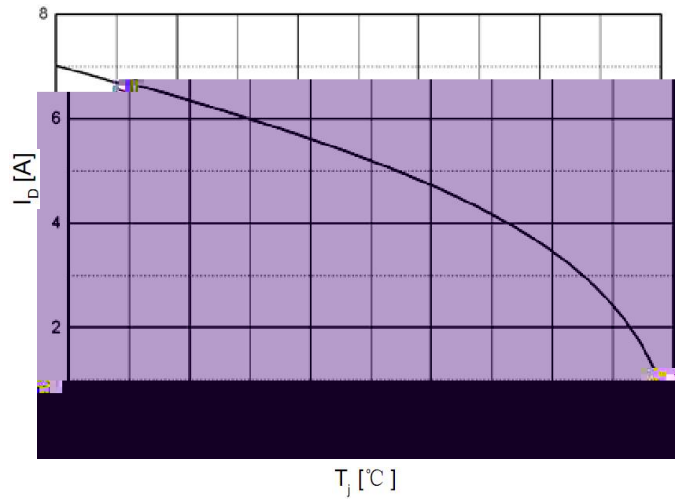
On-Resistance Variation with Temperature



Maximum Safe Operating Area



Maximum Drain Current vs. Case Temperature



TO-220F Package Dimension

UNIT:

SYMBOL	a	SYMBOL	a
A	9.80	D	2.54
A1	7.00	D1	1.15
A2	2.90	D2	0.60
A3	9.10	D3	0.20
B1	15.40	E	2.24
B2	4.35	E1	0.70
B3	6.00	E2	1.0
C	3.00	E3	0.35
C1	15.00	E4	2.30
C2	8.80		30

