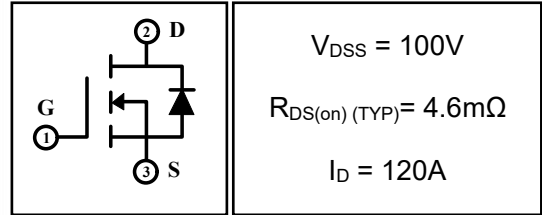


120A 100V N-channel Enhancement Mode Power MOSFET

1 Description

These N-channel enhancement mode power mosfets used advanced splite gate trench technology design, provided excellent Rdson and low gate charge. Which accords with the RoHS standard.

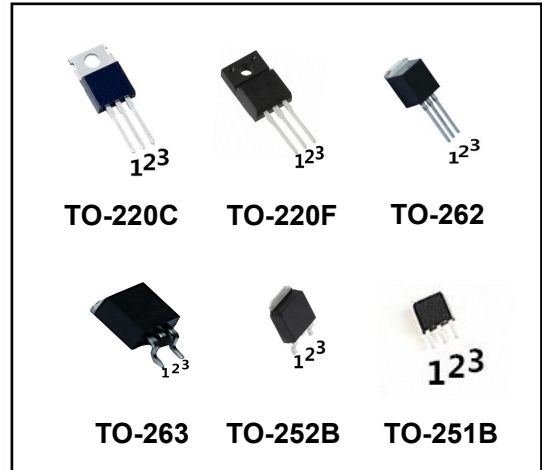


2 Features

- Fast switching
- Low on resistance
- Low gate charge
- High avalanche current
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔV_{DS} test

3 Applications

- Synchronous rectification in SMPS
- Hard switching and high speed circuit
- Power tools
- UPS
- Motor control



4 Electrical Characteristics

4.1 Absolute Maximum Ratings (Tc=25°C, unless otherwise noted)

Parameter	Symbol	Rating				Units
		YJS046 N10	YJS046N10I YJS046N10E	YJS046N10B YJS046N10D	YJS04 6N10F	
Drain-to-Source Voltage	V_{DSS}	100				V
Gate-to-Source Voltage	V_{GSS}	± 20				V
Continuous Drain Current	$T_C=25^\circ C$	120				A
	$T_C=100^\circ C$	90				A
Pulsed Drain Current ⁽¹⁾	I_{DM}	480				A
Single Pulse Avalanche Energy ⁽⁴⁾	E_{AS}	400				mJ
Avalanche Current ⁽⁴⁾	I_{AS}	40				A
Power Dissipation	$T_a=25^\circ C$	2	2	2	2	W
	$T_C=25^\circ C$	160	160	160	34	W
Isolation Voltage	V_{ISO}	/			2500	V
Junction Temperature Range	T_j	-55~150				°C
Storage Temperature Range	T_{stg}	-55~150				°C

4.2 Thermal Characteristics

Parameter	Symbol	Rating				Units
		YJS046 N10	YJS046N10I YJS046N10E	YJS046N10B YJS046N10D	YJS04 6N10F	
Thermal Resistance, Junction to Case-sink	R_{thJC}	0.78	0.78	0.78	3.68	°C/W
Thermal Resistance, Junction to Ambient	R_{thJA}	62.5	62.5	62.5	62.5	°C/W

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

Parameter	Symbol	Test Condition	Value			Units
			Min	Typ	Max	
Off Characteristics						
Drain-to-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100	105	—	V
Drain-to-Source Leakage Current	I _{DSS}	V _{DS} =98V, V _{GS} =0V, T _C =25°C	—	—	1	μA
		V _{DS} =80V, V _{GS} =0V, T _C =125°C	—	—	100	μA
Gate-to-Source Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	—	—	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2	3	4	V
Drain-to-Source on-state Resistance	R _{DS(on)}	V _{GS} =10V, I _D =50A	—	4.6	5.5	mΩ
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{GS} =0V, V _{DS} =40V, f=1.0MHz	—	3815	—	pF
Output Capacitance	C _{oss}		—	652	—	
Reverse Transfer Capacitance	C _{rss}		—	26	—	
Gate Resisitance	R _G	V _{DD} =0V, V _{GS} =0V, F=1MHz	—	3.0	—	Ω
Switching Characteristics						
Turn-on Delay Time	t _{d(on)}	I _D =13.3A, V _{DD} =40V, V _{GS} =10V, R _{GEN} =24Ω	—	49	—	nS
Turn-on Rise Time	t _r		—	76	—	
Turn-off Delay Time	t _{d(off)}		—	157	—	
Turn-off Fall Time	t _f		—	87	—	
Total Gate Charge	Q _g	I _D =50A, V _{DD} =40V, V _{GS} =10V	—	64	—	nC
Gate-to-Source Charge	Q _{gs}		—	23	—	
Gate-to-Drain("Miller") Charge	Q _{gd}		—	17	—	
Drain-Source Diode Characteristics						
Diode Forward Voltage ⁽³⁾	V _{SD}	V _{GS} =0V, I _S =50A	—	—	1.4	V
Diode Forward Current	I _S		—	—	120	A
Reverse Recovery Time ⁽³⁾	t _{rr}	T _J =25°C, I _F =20A, di _F /dt=100A/μS, V _{GS} =0V	—	66	—	nS
Reverse Recovery Charge ⁽³⁾	Q _{rr}		—	150	—	nC

Notes:

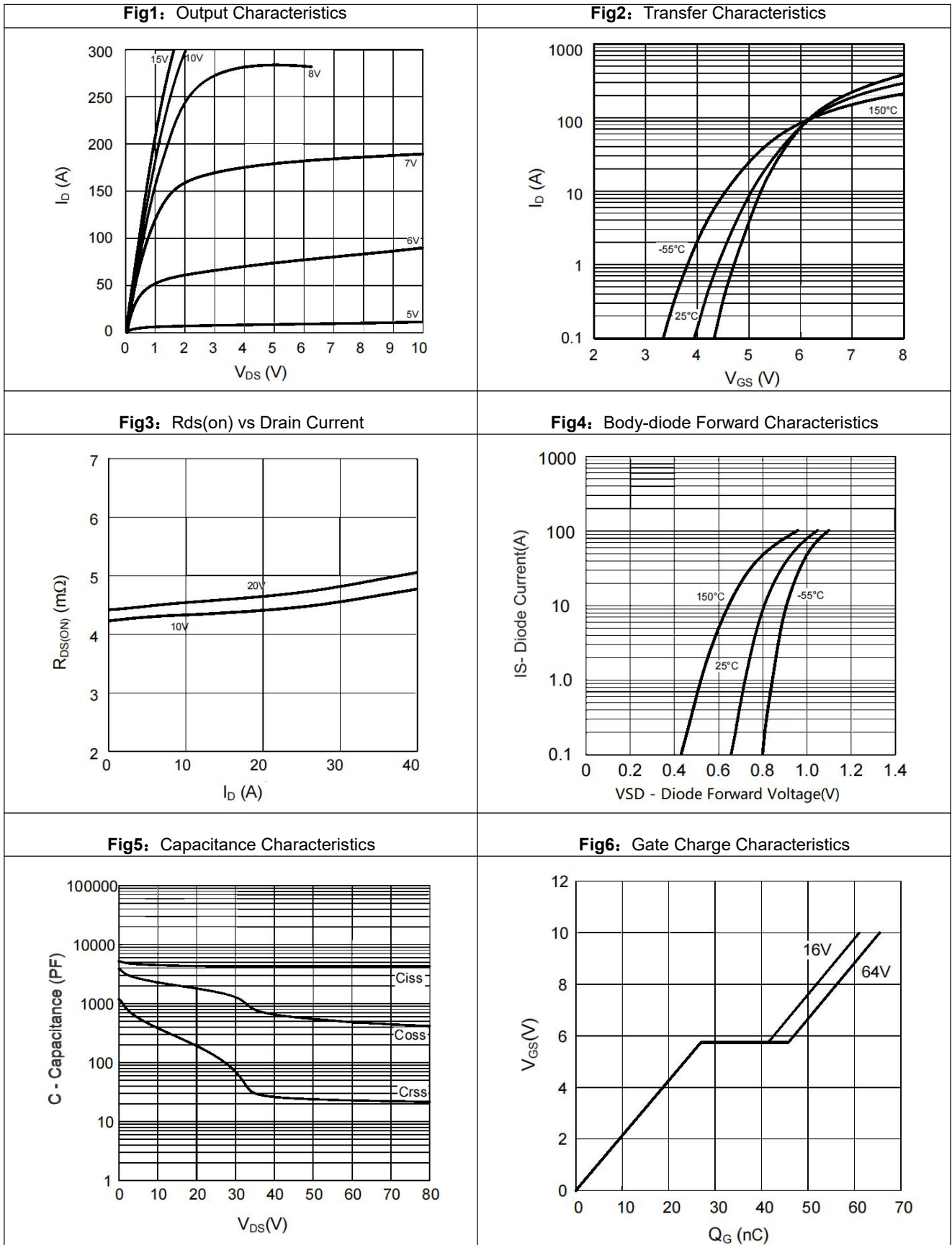
1: Repetitive rating, pulse width limited by maximum junction temperature.

2: Surface mounted on FR4 Board, t≤10sec.

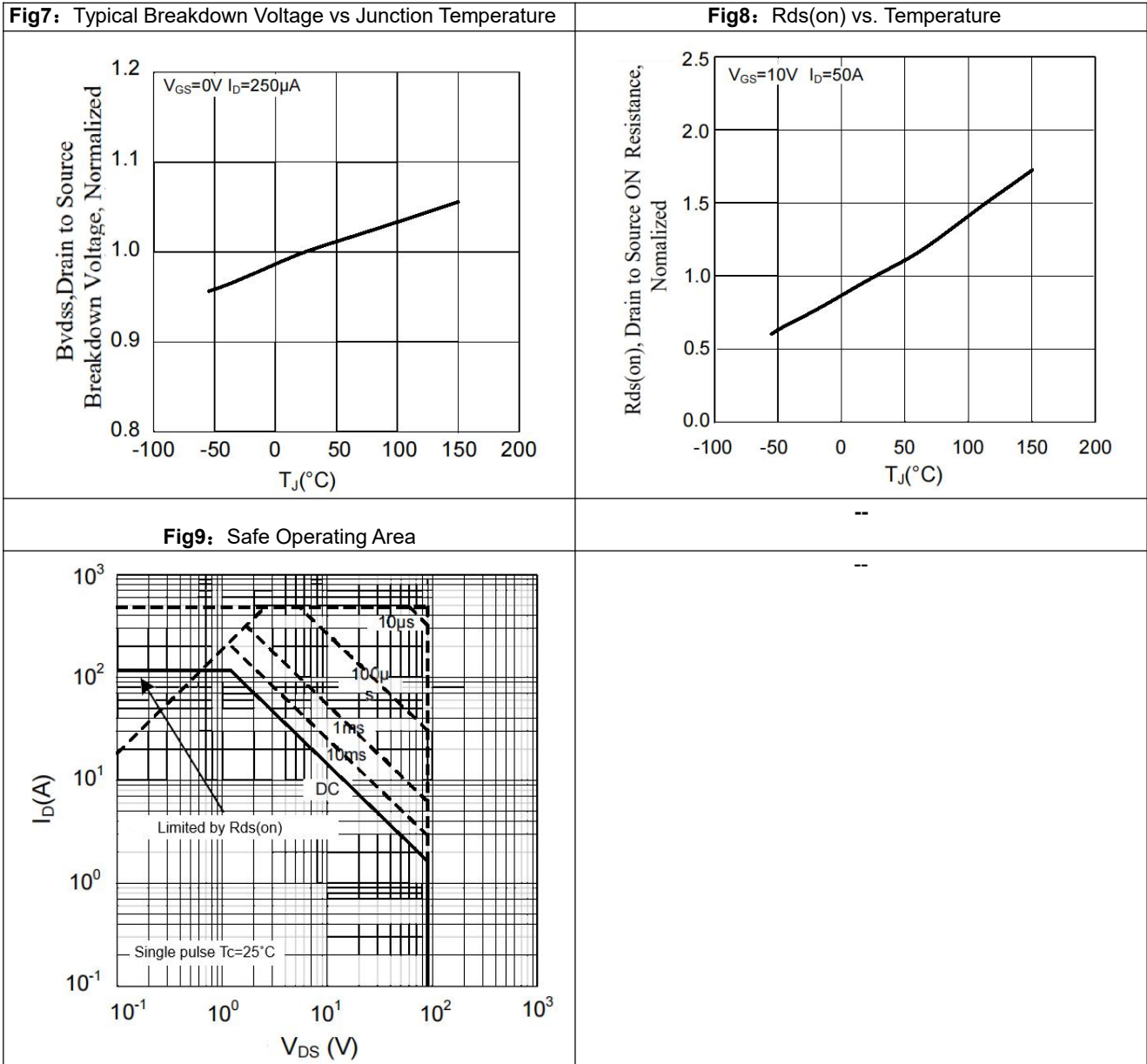
3: Pulse width ≤ 300μs, duty cycle ≤ 2%.

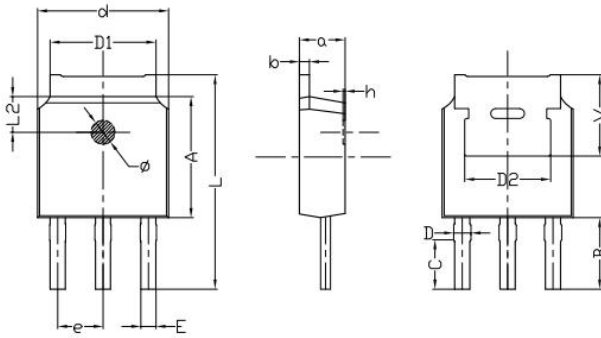
 4: L=0.5mH, I_D=40A, V_{DD}=80V, R_G=25Ω, V_{GATE}=100V, Start T_J=25°C.

5 Typical characteristics diagrams

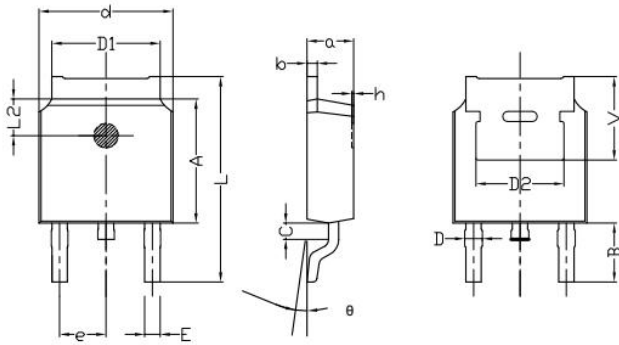


6 Typical characteristics diagrams(Continues)



6 Dimensions
TO-251B PACKAGE OUTLINE DIMENSIONS


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.0946
b	0.46	0.58	0.018	0.023
C	2.45	2.65	0.097	0.104
D	0.80	0.90	0.032	0.035
d	6.30	6.70	0.248	0.264
D1	5.00	5.50	0.197	0.217
D2	TYP 4.83		TYP 0.190	
A	5.80	6.20	0.228	0.244
e	2.19	2.39	0.086	0.094
L	10.40	11.00	0.4098	0.4334
B	3.50	3.70	0.1379	0.1458
L2	1.5	1.8	0.059	0.071
Φ	1.10	1.30	0.0433	0.0512
h	0.00	0.30	0.000	0.012
V	5.25	5.85	0.207	0.230
E	0.60	0.80	0.0236	0.0315

TO-252B PACKAGE OUTLINE DIMENSIONS


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	min.	max.	min.	max.
a	2.20	2.40	0.087	0.095
b	0.46	0.58	0.018	0.023
c	0.70	0.90	0.028	0.035
D	0.80	1.00	0.032	0.039
d	6.30	6.70	0.248	0.264
D1	5.00	5.50	0.197	0.217
D2	TYP 4.83		TYP 0.190	
A	5.80	6.20	0.228	0.244
e	2.19	2.39	0.086	0.094
L	9.40	10.40	0.370	0.409
B	2.6	3.2	0.102	0.126
L2	1.5	1.8	0.059	0.071
θ	0	8	0	8
h	0	0.3	0	0.012
V	5.25	5.85	0.207	0.230
E	0.6	0.8	0.024	0.032