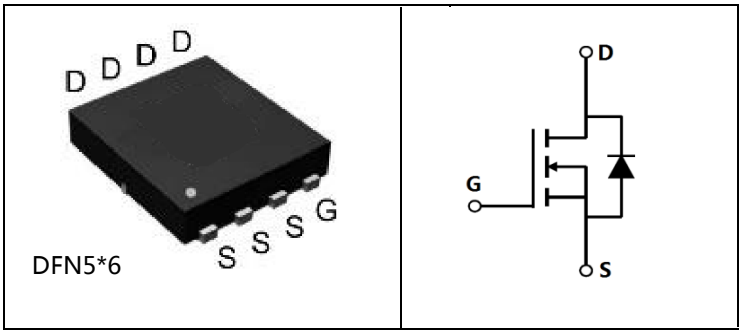
Features

- BV_{DSS}=100V, I_D=94A
- $R_{DS(on)}$:6.5mΩ (Max) @ V_{GS}=10V
- $R_{DS(on)}$:9mΩ (Max) @ V_{GS}=4.5V
- N-Channel，5V Logic Level Control
- Enhancement mode
- Very low on-resistance $R_{DS(on)}$ @ V_{GS}=4.5V
- 100% Avalanche test



RoHS

Device Marking and Package Information		
Ordering code	**Package**	**Marking**
MPGJ10R7	DFN5*6	MPGJ10R7

Maximum ratings, at T_A =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
$V_{(BR)DSS}$	Drain-Source breakdown voltage		100	V
V_{GS}	Gate-Source voltage		±20	V
I_S	Diode continuous forward current	T_C=25°C	94	A
I_D	Continuous drain current @VGS=10V	T_C=25°C	94	A
		T_C=100°C	67	A
I_{DM}	Pulse drain current tested ①	T_C=25°C	376	A
I_{DSM}	Continuous drain current @VGS=10V	T_A=25°C	10	A
		T_A=70°C	8	A
EAS	Avalanche energy, single pulsed ②		41	mJ
P_D	Maximum power dissipation	T_C=25°C	115	W
P_{DSM}	Maximum power dissipation ③	T_A=25°C	1.25	W
T_{STG}, T_J	Storage and Junction Temperature Range		-55 to 175	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	1.4	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	100	°C/W

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @ T_j=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=100V,V_{GS}=0V	--	--	1	μA
	Zero Gate Voltage Drain Current(T_j=125℃)	V_{DS}=100V,V_{GS}=0V	--	--	100	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(TH)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.1	--	2.3	V
$R_{DS(ON)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=20A	--	5.2	6.5	mΩ
$R_{DS(ON)}$	Drain-Source On-State Resistance ④	V_{GS}=4.5V, I_D=15A	--	7.0	9.0	mΩ
Dynamic Electrical Characteristics @ T_j = 25°C (unless otherwise stated)						
C_{iss}	Input Capacitance	V_{DS}=30V,V_{GS}=0V, f=1MHz	--	2945	--	pF
C_{oss}	Output Capacitance		--	950	--	pF
C_{rss}	Reverse Transfer Capacitance		--	100	--	pF
R_g	Gate Resistance	f=1MHz	--	1	--	Ω
Q_g	Total Gate Charge	V_{DS}=50V,I_D=20A, V_{GS}=10V	--	50	--	nC
Q_{gs}	Gate-Source Charge		--	6	--	nC
Q_{gd}	Gate-Drain Charge		--	10	--	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=50V, I_D=20A, R_G=3Ω, V_{GS}=10V	--	11.7	--	ns
t_r	Turn-on Rise Time		--	7.2	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	34.5	--	ns
t_f	Turn-Off Fall Time		--	12.3	--	ns
Source- Drain Diode Characteristics@ T_j = 25°C (unless otherwise stated)						
V_{SD}	Forward on voltage	I_{SD}=20A,V_{GS}=0V	--	0.8	1.2	V
t_{rr}	Reverse Recovery Time	T_j=25℃,I_{sd}=20A, V_{GS}=0V di/dt=500A/μs	--	21.6	--	ns
Q_{rr}	Reverse Recovery Charge		--	44.7	--	nC

NOTE:

① Repetitive rating; pulse width limited by max junction temperature.

② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH,R_G = 25Ω, I_{AS} = 10A, V_{GS} =10V. Part not recommended for use above this value

③ The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.

④ Pulse width ≤ 300μs; duty cycle≤ 2%.

Typical Characteristics

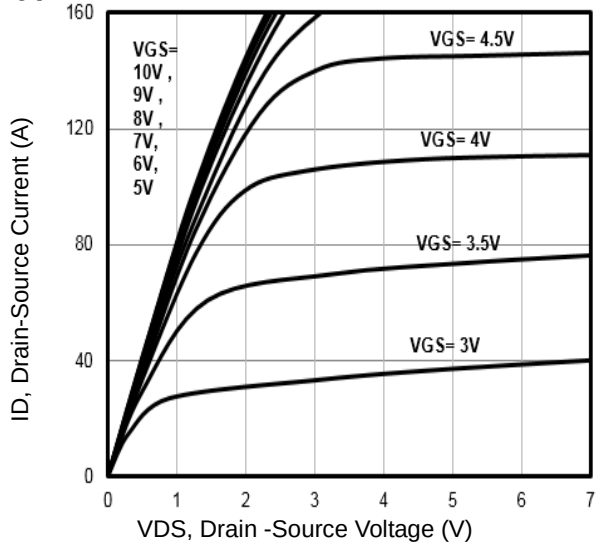


Fig1. Typical Output Characteristics

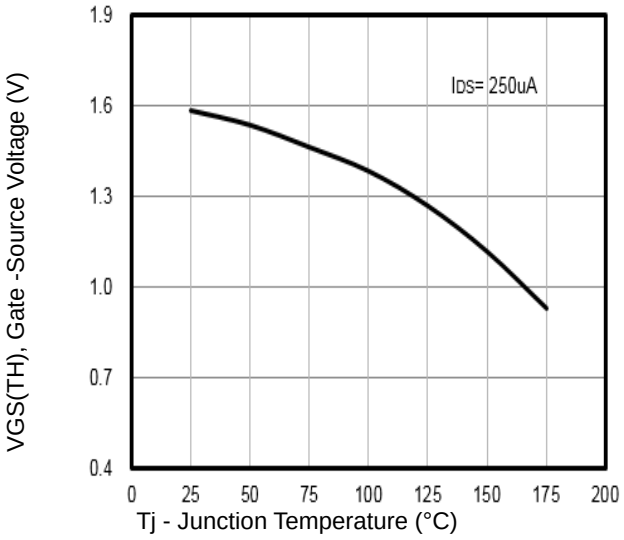


Fig2. $V_{GS(TH)}$ Gate -Source Voltage Vs.Tj

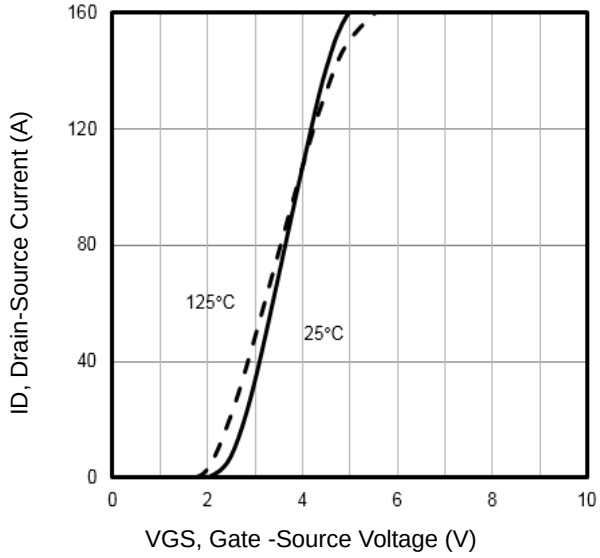


Fig3. Typical Transfer Characteristics

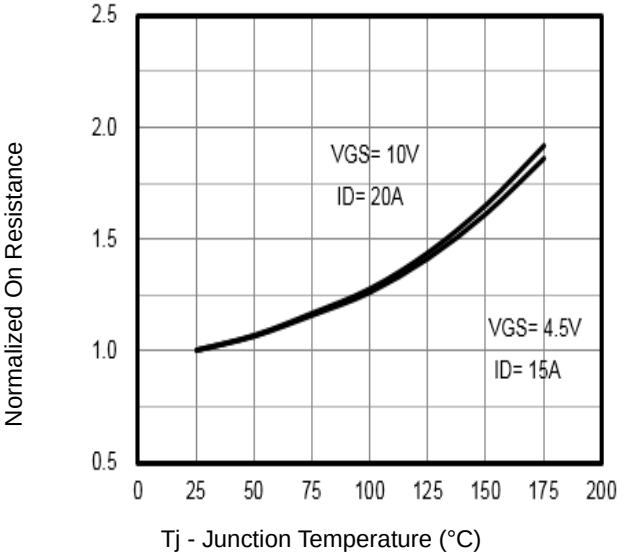


Fig4. Normalized On-Resistance Vs. Tj

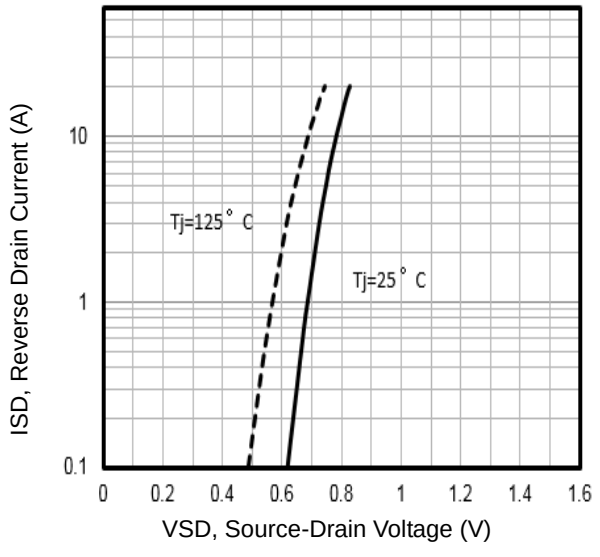


Fig5. Typical Source-Drain Diode Forward Voltage

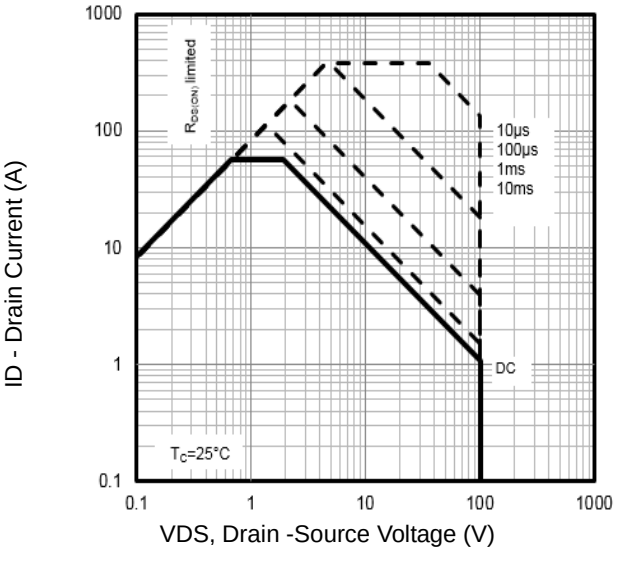


Fig6. Maximum Safe Operating Area

Typical Characteristics

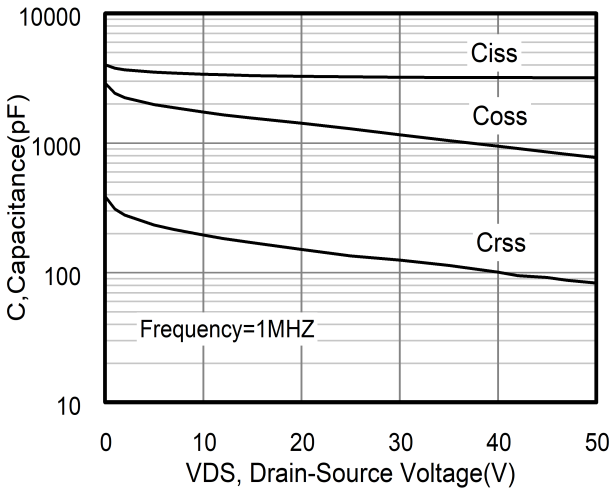


Fig7. Typical Capacitance Vs.Drain-Source Voltage

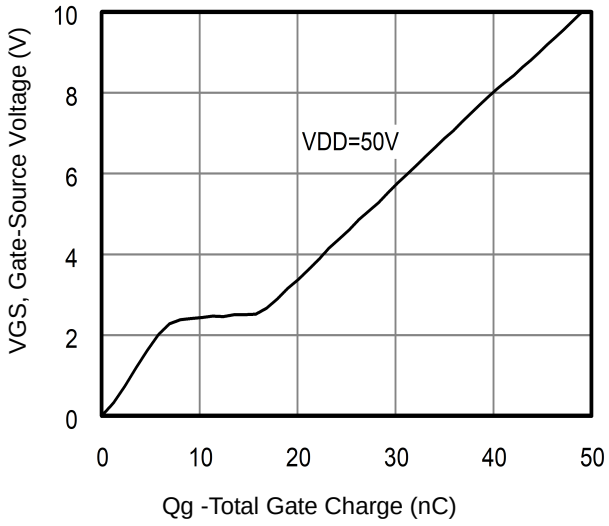


Fig8. Typical Gate Charge Vs.Gate-Source Voltage

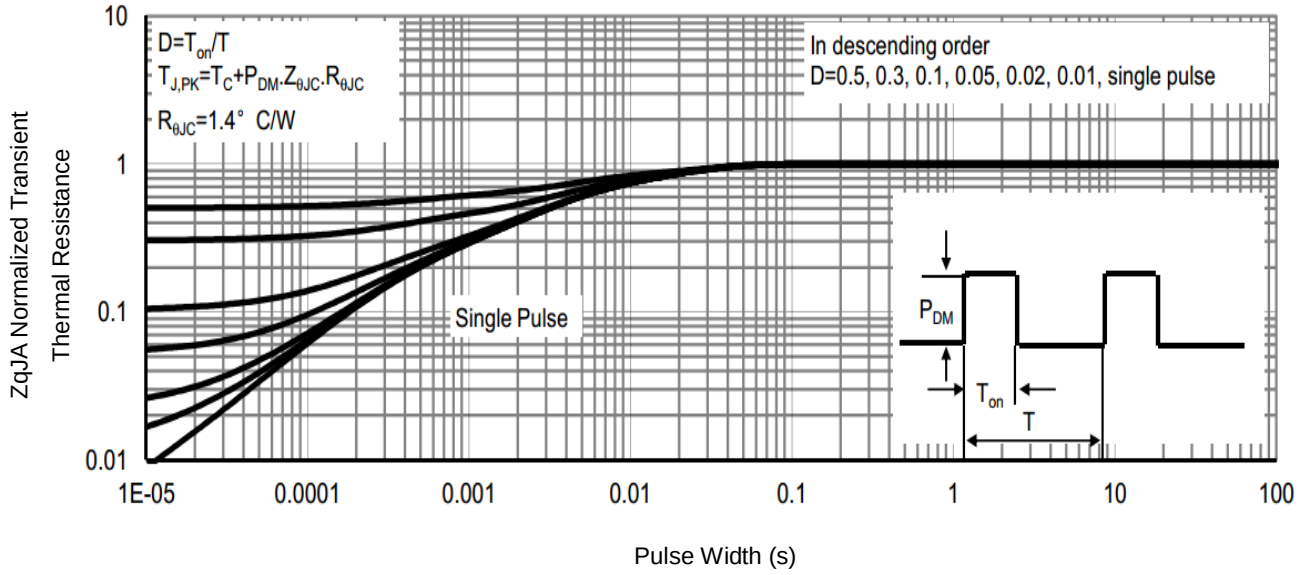


Fig9. Normalized Maximum Transient Thermal Impedance

Figure A：Gate Charge Test Circuit and Waveform

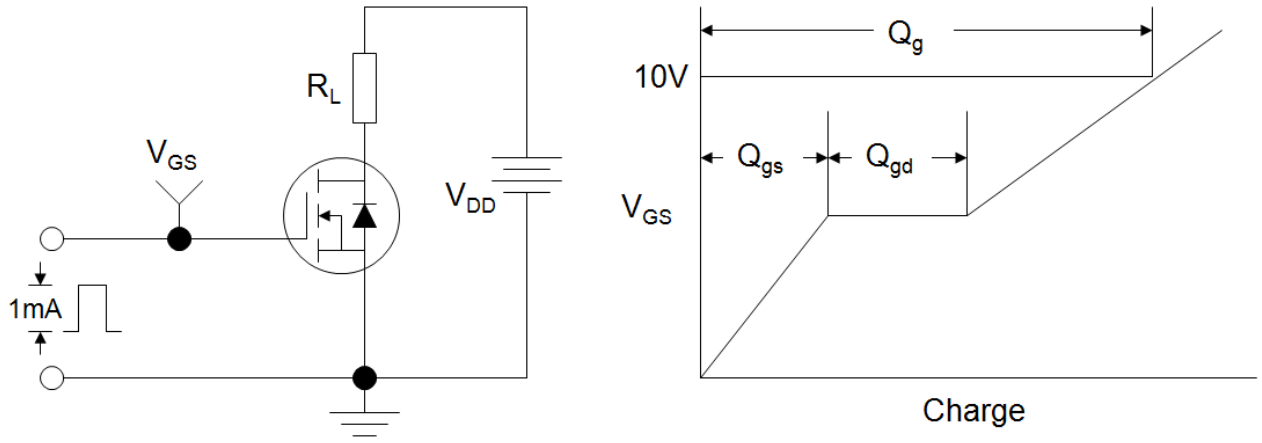


Figure B：Resistive Switching Test Circuit and Waveform

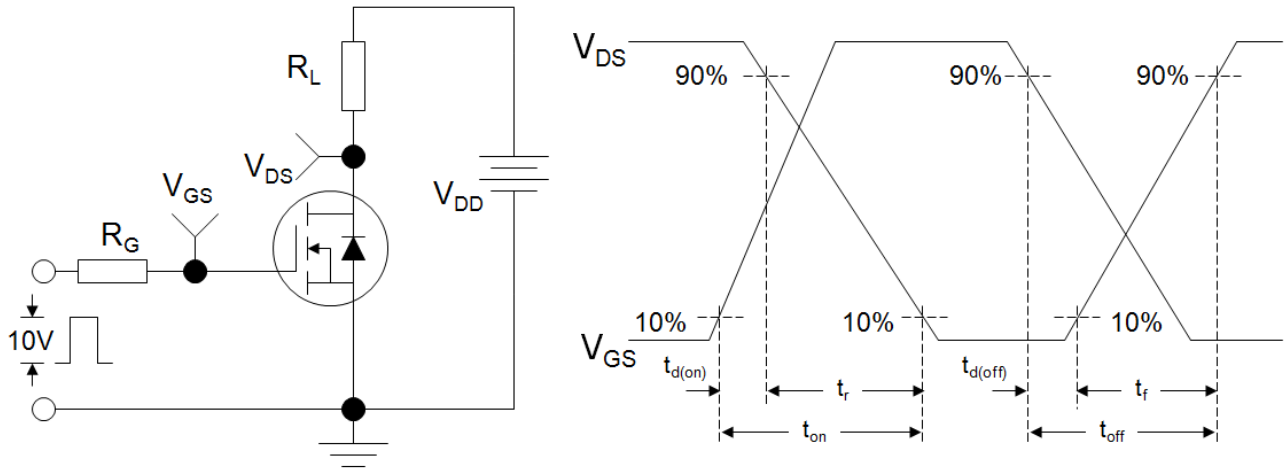
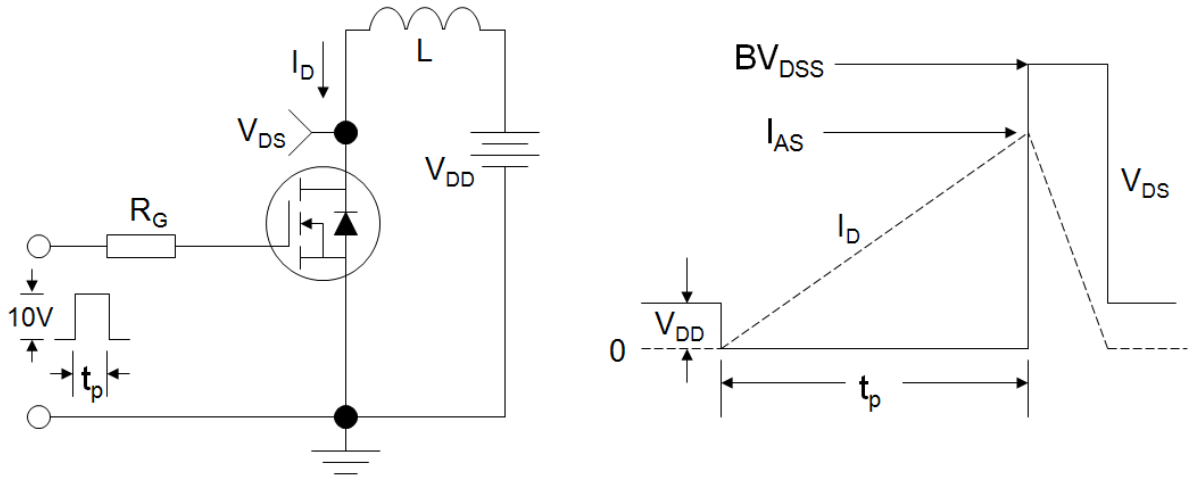
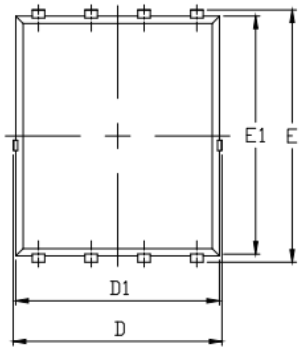


Figure C：Unclamped Inductive Switching Test Circuit and Waveform

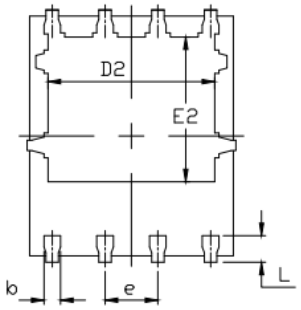


Package Information

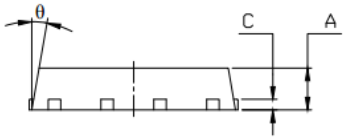
DFN5*6 package outline dimension



Top View



Bottom View



Side View

Power56			
DIM.	MIN.	MAX.	TYP.
A	0.95	1.05	1.00
b	0.30	0.50	0.40
C	0.254		
D	5.02		
D1	4.80	5.00	4.90
D2	3.91	4.11	4.01
E	5.95	6.15	6.05
E1	5.60	5.90	5.75
E2	3.38	3.58	3.48
e	1.27REF		
L	0.45	0.65	0.55
θ	10°		

Revision History

Revision	Date	Subjects (major changes since last revision)
1.0	2020-03	Initial version
2.0	2021-08	$RDS_{(ON)}$max
2.1	2022-05	Thermal resistance, PD and Capacitance fig