Features

- Extremely low on-resistance $R_{DS(on)}$
- Low reverse transfer capacitances
- 100% single pulse avalanche energy test
- 100% ΔVDS test
- Pb-Free plating / Halogen-Free / RoHS compliant

Key Parameters

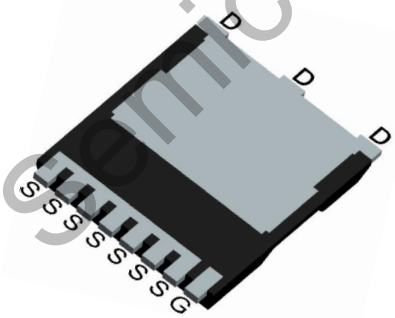
V_{DS}	120V
$R_{DS(on)typ.}$	2.1mΩ
I_D	310A
Vth	3V
Ciss	9389pF
Qgd	31nC

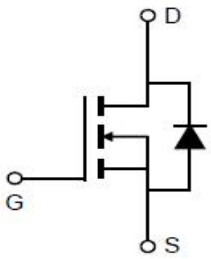
Applications

- Motor Control and Drive
- Charge/Discharge for Battery Management System
- Synchronous Rectifier for SMPS

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Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Drain-source voltage	V_{DS}	120	V
Gate-Source voltage	V_{GS}	±20	V
Continuous drain current T_C = 25°C T_C = 100°C	I_D	 310 219	A
Pulsed drain current (T_C = 25°C, t_p limited by T_{jmax})	$I_{D\ pulse}$	1240	A
Avalanche energy, single pulse (L=0.5mH, Rg=25Ω)[1]	E_{AS}	2025	mJ
Power dissipation T_C = 25°C	P_{tot}	429	W
Power dissipation T_A = 25°C	P_{tot}	2.0	W
Operating junction and storage temperature	T_j , T_{stg}	-55...+175	°C

Notes:1.EAS was tested at Tj = 25°C, L = 0.5mH, Id=63A.

Thermal Resistance

Parameter	Symbol	Max	Unit
Thermal resistance, junction – case.	R_{thJC}	0.35	°C/W
Thermal resistance, junction – ambient(min. footprint)	R_{thJA}	75	°C/W

Electrical Characteristic (at Tj = 25 °C, unless otherwise specified)

Static Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Drain-source breakdown voltage	BV_{DSS}	120	-	-	V	V_{GS}=0V, I_D=250uA
Gate threshold voltage	$V_{GS(th)}$	2.0	3.0	4.0	V	V_{DS}=V_{GS},I_D=250uA
Zero gate voltage drain current	I_{DSS}	-	-	1	μA	V_{DS}=120V,V_{GS}=0V T_j=25°C
		-	-	100		T_j=125°C
Gate-source leakage current	I_{GSS}	-	-	100	nA	V_{GS}=20V,V_{DS}=0V
Drain-source on-state resistance	$R_{DS(on)}$	-	2.1	2.3	mΩ	V_{GS}=10V, I_D=90A
Transconductance	g_{fs}	-	162	-	S	V_{DS}=5V,I_D=90A

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Dynamic Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Input Capacitance	C_{iss}	-	9389	-	pF	V_{GS}=0V, V_{DS}=60V, f=1MHz
Output Capacitance	C_{oss}	-	1339	-		
Reverse Transfer Capacitance	C_{rss}	-	52	-		
Gate Total Charge	Q_G	-	139	-	nC	V_{GS}=10V, V_{DS}=60V, I_D=90A
Gate-Source charge	Q_{gs}	-	49	-		
Gate-Drain charge	Q_{gd}	-	31	-		
Gate plateau voltage	$V_{plateau}$	-	5.1	-	V	
Turn-on delay time	$t_{d(on)}$	-	32	-	ns	V_{GS}=10V, V_{DD}=60V, R_{G_ext}=3Ω, I_D=90A
Rise time	t_r	-	103	-		
Turn-off delay time	$t_{d(off)}$	-	66	-		
Fall time	t_f	-	47	-		

Body Diode Characteristic

Parameter	Symbol	Value			Unit	Test Condition
		min.	typ.	max.		
Diode Max Current	I_S		-	310	A	-
Diode Forward Voltage	V_{SD}	-	-	1.2	V	V_{GS}=0V,I_{SD}=60A
Diode Reverse Recovery Time	t_{rr}	-	111	-	ns	I_F=60A, dI/dt=100A/μs
Diode Reverse Recovery Charge	Q_{rr}	-	179	-	nC	

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Typical Characteristics Diagram

Fig1. Output Characteristics

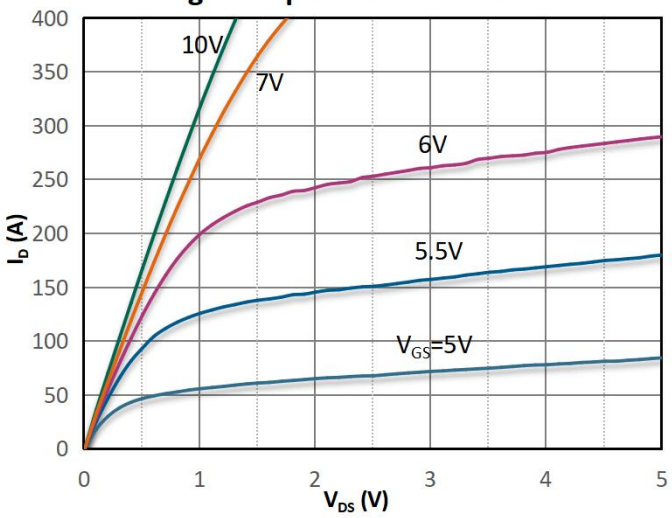


Fig2. Transfer Characteristics

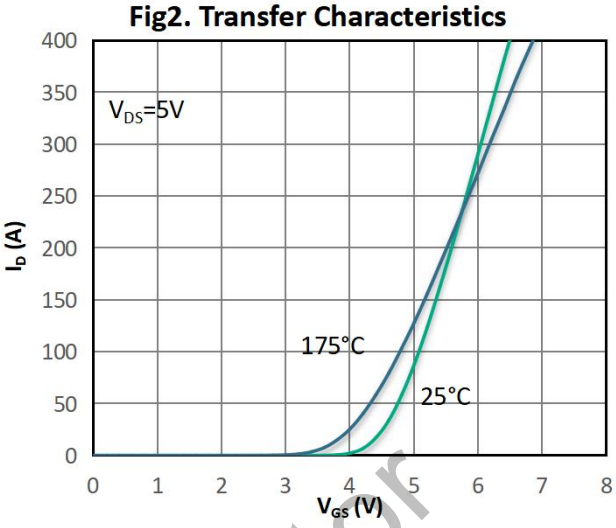


Fig3. Rds(on) vs Drain Current

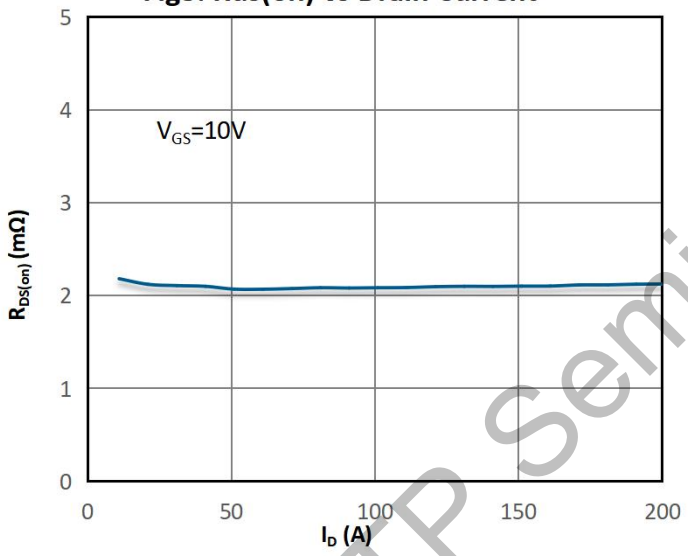


Fig 4. Rds(on) vs Gate Voltage

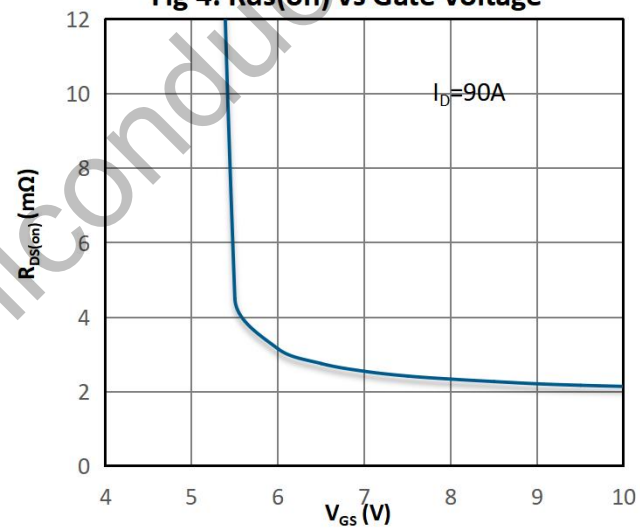


Fig5. Rds(on) vs. Temperature

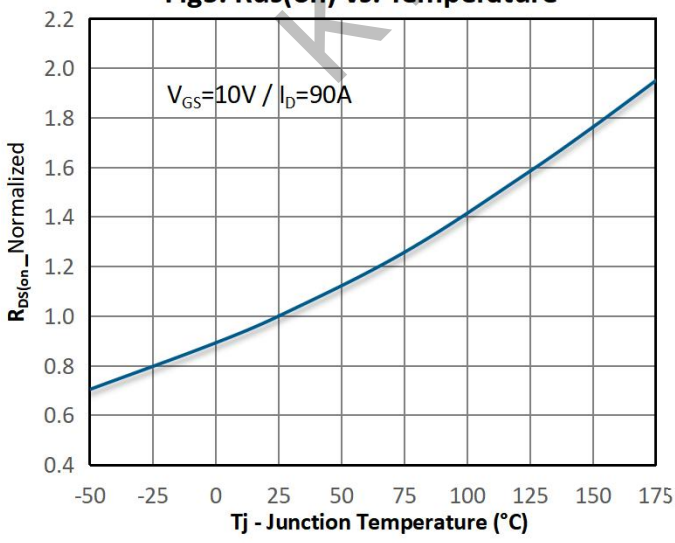
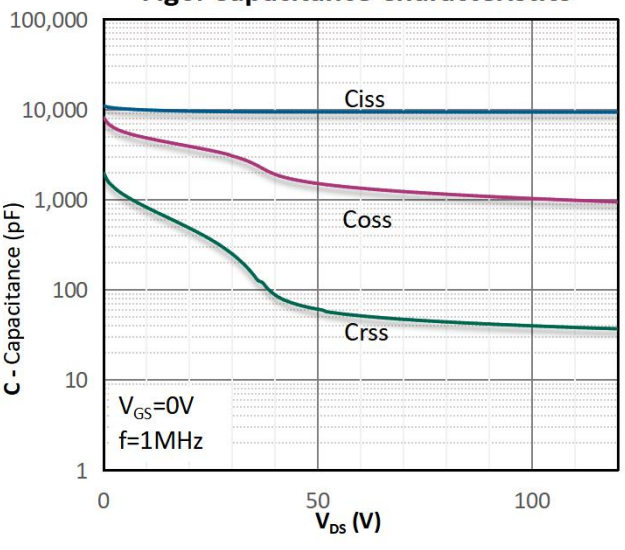


Fig6. Capacitance Characteristics



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Typical Characteristics Diagram

Fig7. Gate Charge Characteristics

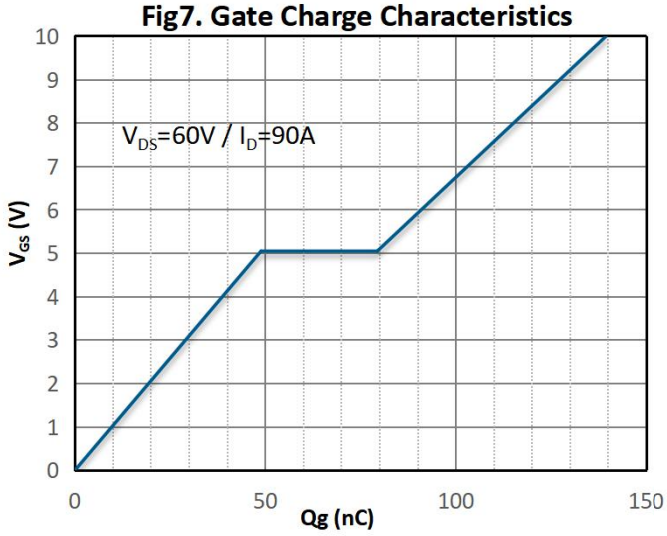


Fig8. Body-diode Forward Characteristics

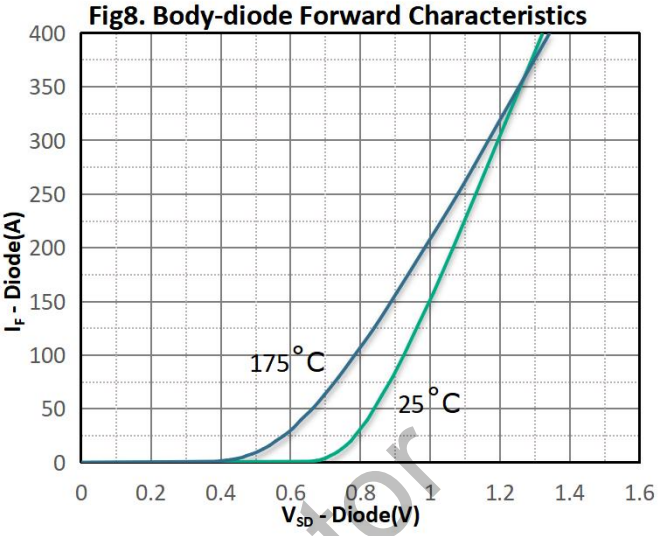


Fig9. Power De-rating

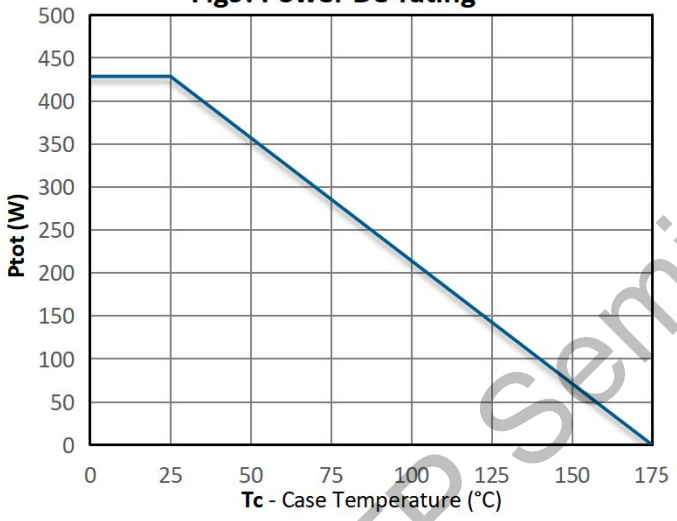


Fig10. Current De-rating

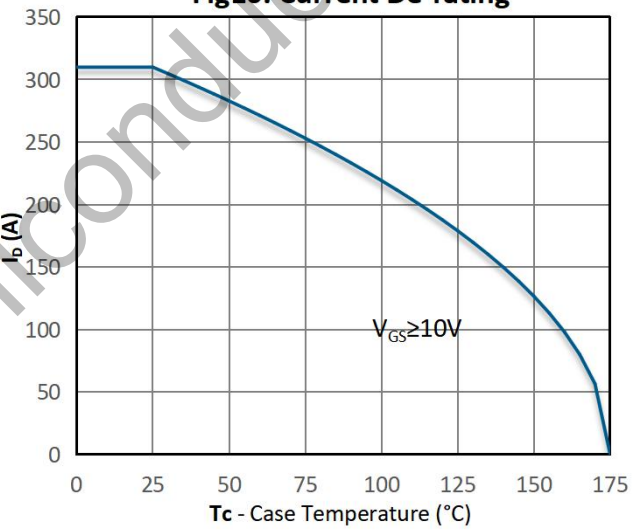


Fig11. Safe Operating Area

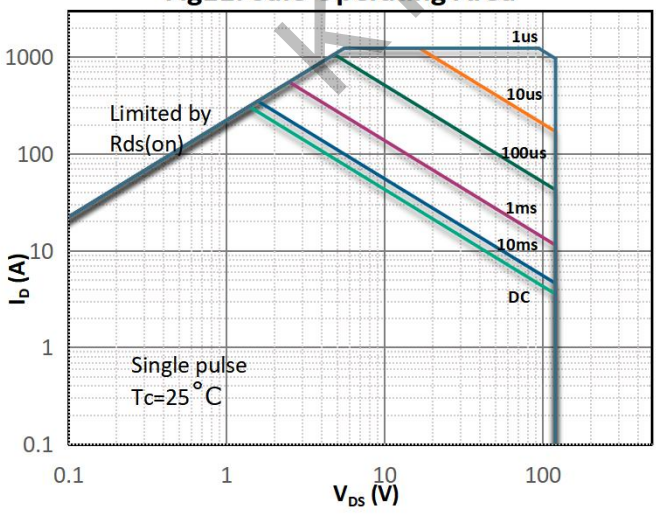
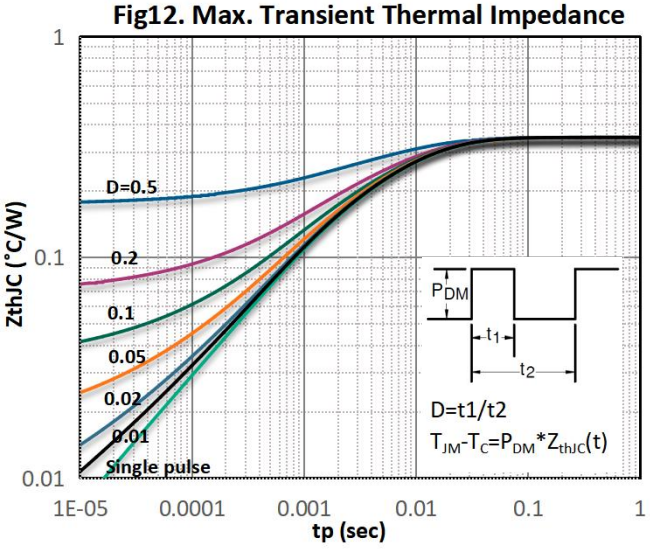


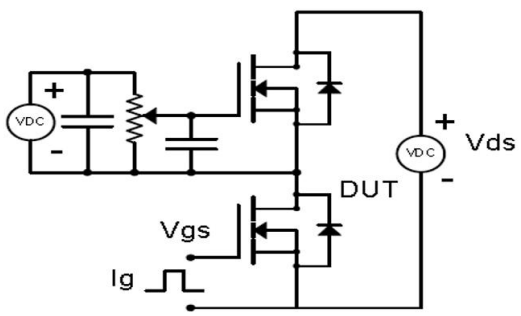
Fig12. Max. Transient Thermal Impedance

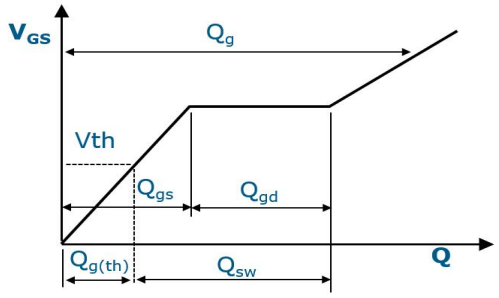


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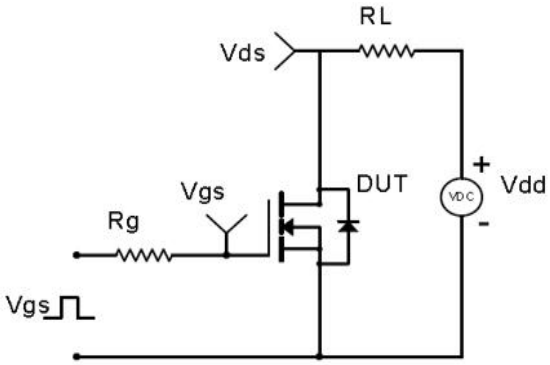
Test Circuit & Waveform

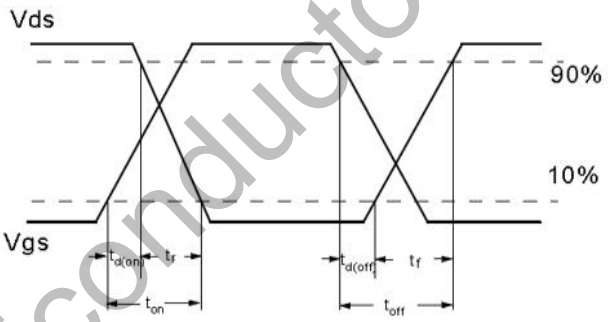
Gate Charge Test Circuit & Waveform



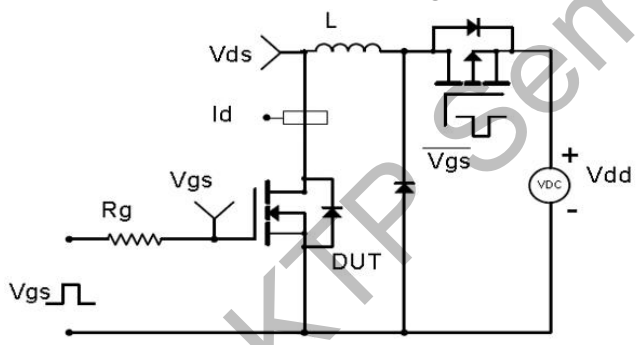


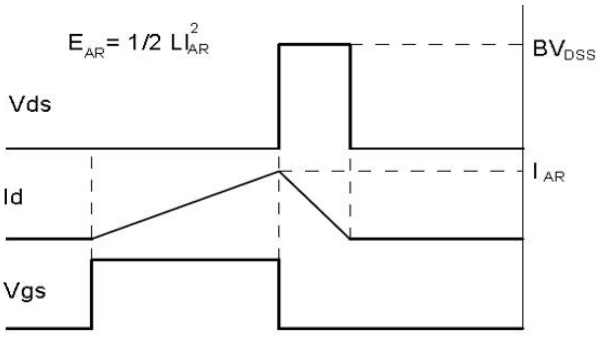
MOSFET Switching Test Circuit & Waveform



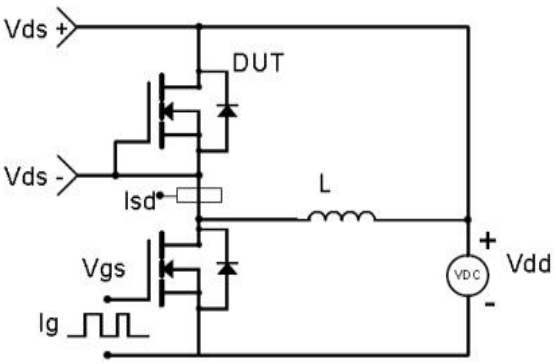


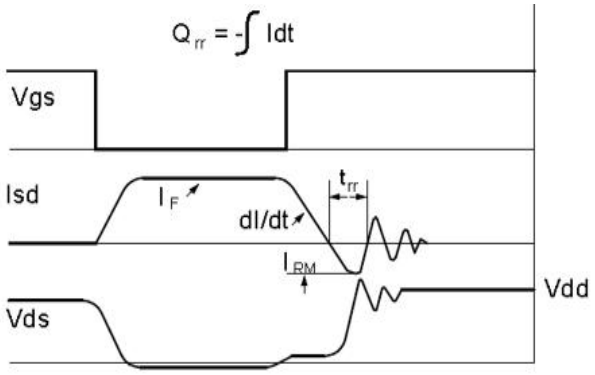
E_{AS} Test Circuit & Waveform





Diode Recovery Test Circuit & Waveform





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