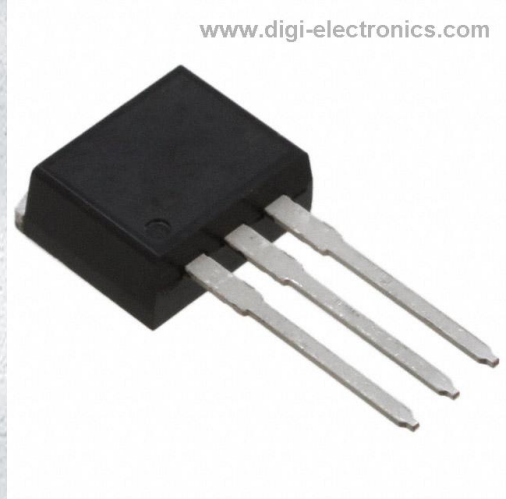
IRLW630ATM Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	IRLW630ATM-DG
Manufacturer	onsemi
Manufacturer Product Number	IRLW630ATM
Description	MOSFET N-CH 200V 9A I2PAK
Detailed Description	N-Channel 200 V 9A (Tc) 3.1W (Ta), 69W (Tc) Through Hole TO-262 (I2PAK)

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
IRLW630ATM	onsemi
Series:	Product Status:
-	Obsolete
FET Type:	Technology:
N-Channel	MOSFET (Metal Oxide)
Drain to Source Voltage (Vdss):	Current - Continuous Drain (Id) @ 25°C:
200 V	9A (Tc)
Drive Voltage (Max Rds On, Min Rds On):	Rds On (Max) @ Id, Vgs:
5V	400mOhm @ 4.5A, 5V
Vgs(th) (Max) @ Id:	Gate Charge (Qg) (Max) @ Vgs:
2V @ 250µA	27 nC @ 5 V
Vgs (Max):	Input Capacitance (Ciss) (Max) @ Vds:
±20V	755 pF @ 25 V
FET Feature:	Power Dissipation (Max):
-	3.1W (Ta), 69W (Tc)
Operating Temperature:	Mounting Type:
-55°C ~ 150°C (TJ)	Through Hole
Supplier Device Package:	Package / Case:
TO-262 (I2PAK)	TO-262-3 Long Leads, I2PAK, TO-262AA
Base Product Number:	
IRLW63	

Environmental & Export classification

Moisture Sensitivity Level (MSL):	REACH Status:
1 (Unlimited)	REACH Unaffected
ECCN:	HTSUS:
EAR99	8541.29.0095

Advanced Power MOSFET

IRLW/I630A

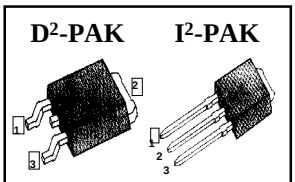
FEATURES

- Avalanche Rugged Technology
- Rugged Gate Oxide Technology
- Lower Input Capacitance
- Improved Gate Charge
- Extended Safe Operating Area
- 150°C Operating Temperature
- Lower Leakage Current: 10μA (Max.) @ V_{DS} = 200V
- Lower $R_{DS(ON)}$: 0.335Ω (Typ.)

BV_{DSS} = 200 V

$R_{DS(on)}$ = 0.4Ω

I_D = 9 A



1. Gate 2. Drain 3. Source

Absolute Maximum Ratings

Symbol	Characteristic	Value	Units
V_{DSS}	Drain-to-Source Voltage	200	V
I_D	Continuous Drain Current (T_C=25°C)	9	A
	Continuous Drain Current (T_C=100°C)	5.7	
I_{DM}	Drain Current-Pulsed (1)	32	A
V_{GS}	Gate-to-Source Voltage	±20	V
E_{AS}	Single Pulsed Avalanche Energy (2)	54	mJ
I_{AR}	Avalanche Current (1)	9	A
E_{AR}	Repetitive Avalanche Energy (1)	6.9	mJ
dv/dt	Peak Diode Recovery dv/dt (3)	5	V/ns
P_D	Total Power Dissipation (T_A=25°C) *	3.1	W
	Total Power Dissipation (T_C=25°C)	69	W
	Linear Derating Factor	0.55	W/°C
T_J , T_{STG}	Operating Junction and Storage Temperature Range	- 55 to +150	°C
T_L	Maximum Lead Temp. for Soldering Purposes, 1/8. from case for 5-seconds	300	

Thermal Resistance

Symbol	Characteristic	Typ.	Max.	Units
$R_{\theta JC}$	Junction-to-Case	--	1.81	°C/W
$R_{\theta JA}$	Junction-to-Ambient *	--	40	
$R_{\theta JA}$	Junction-to-Ambient	--	62.5	

* When mounted on the minimum pad size recommended (PCB Mount).

Rev. B

FAIRCHILD SEMICONDUCTOR™

Electrical Characteristics (T_C=25°C unless otherwise specified)

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
BV_{DSS}	Drain-Source Breakdown Voltage	200	--	--	V	V_{GS}=0V,I_D=250μA
$\Delta BV/\Delta T_J$	Breakdown Voltage Temp. Coeff.	--	0.18	--	V/°C	I_D=250μA ***See Fig 7***
$V_{GS(th)}$	Gate Threshold Voltage	1.0	--	2.0	V	V_{DS}=5V,I_D=250μA
I_{GSS}	Gate-Source Leakage , Forward	--	--	100	nA	V_{GS}=20V
	Gate-Source Leakage , Reverse	--	--	-100		V_{GS}=-20V
I_{DSS}	Drain-to-Source Leakage Current	--	--	10	μA	V_{DS}=200V
		--	--	100		V_{DS}=160V,T_C=125°C
$R_{DS(on)}$	Static Drain-Source On-State Resistance	--	--	0.4	Ω	V_{GS}=5V,I_D=4.5A (4)
g_{fs}	Forward Transconductance	--	4.5	--	℧	V_{DS}=40V,I_D=4.5A (4)
C_{iss}	Input Capacitance	--	580	755	pF	V_{GS}=0V,V_{DS}=25V,f =1MHz ***See Fig 5***
C_{oss}	Output Capacitance	--	90	115		
C_{rss}	Reverse Transfer Capacitance	--	44	55		
$t_{d(on)}$	Turn-On Delay Time	--	8	25	ns	V_{DD}=100V,I_D=9A, R_G=6Ω ***See Fig 13*** (4) (5)
t_r	Rise Time	--	6	20		
$t_{d(off)}$	Turn-Off Delay Time	--	30	70		
t_f	Fall Time	--	9	30		
Q_g	Total Gate Charge	--	18.6	27	nC	V_{DS}=160V,V_{GS}=5V, I_D=9A ***See Fig 6 & Fig 12*** (4) (5)
Q_{gs}	Gate-Source Charge	--	3.5	--		
Q_{gd}	Gate-Drain (. Miller.) Charge	--	8.3	--		

Source-Drain Diode Ratings and Characteristics

Symbol	Characteristic	Min.	Typ.	Max.	Units	Test Condition
I_S	Continuous Source Current	--	--	9	A	Integral reverse pn-diode in the MOSFET
I_{SM}	Pulsed-Source Current (1)	--	--	32		
V_{SD}	Diode Forward Voltage (4)	--	--	1.5	V	T_J=25°C,I_S=9A,V_{GS}=0V
t_{rr}	Reverse Recovery Time	--	158	--	ns	T_J=25°C,I_F=9A
Q_{rr}	Reverse Recovery Charge	--	0.78	--	μC	di_F/dt=100A/μs (4)

Notes;

(1) Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

(2) L=1mH, I_{AS}=9A, V_{DD}=50V, R_G=27Ω, Starting T_J=25°C

(3) I_{SD} ≤ 9A, di/dt ≤ 220A/μs, V_{DD} ≤ BV_{DSS} , Starting T_J=25°C

(4) Pulse Test: Pulse Width = 250μs, Duty Cycle ≤ 2%

(5) Essentially Independent of Operating Temperature

Fig 1. Output Characteristics

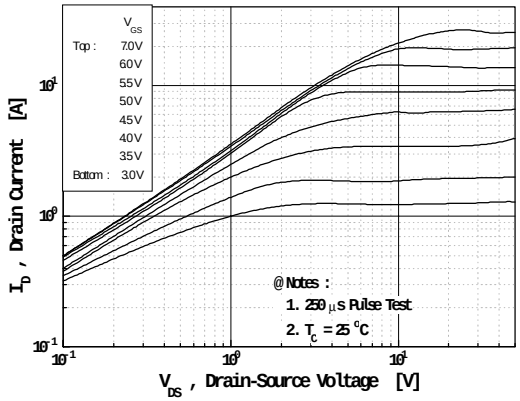


Fig 2. Transfer Characteristics

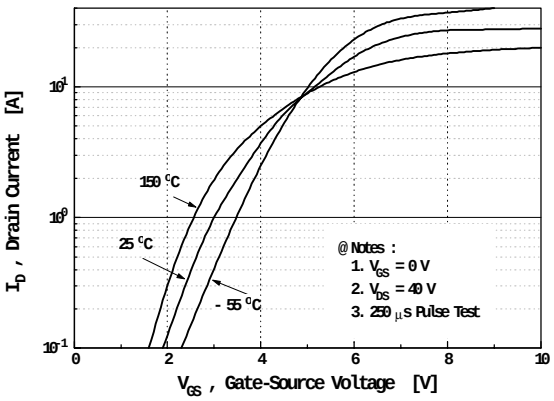


Fig 3. On-Resistance vs. Drain Current

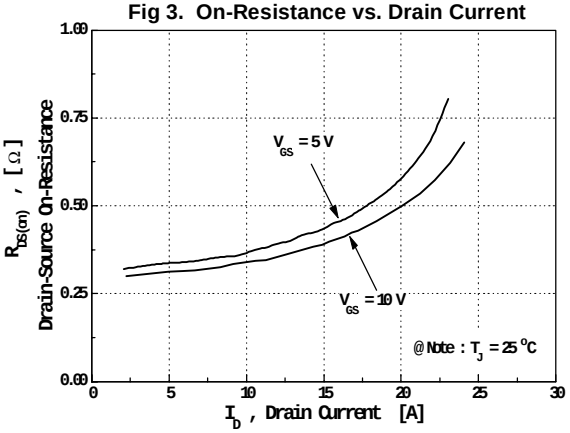


Fig 4. Source-Drain Diode Forward Voltage

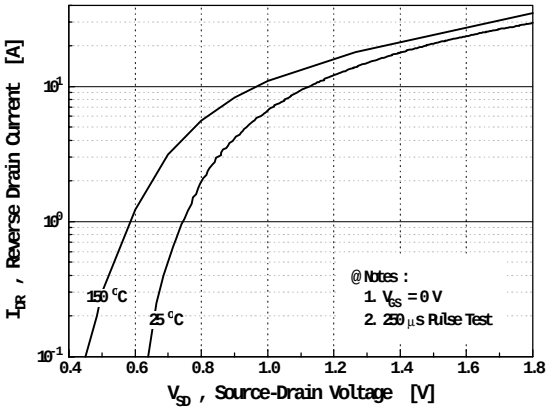


Fig 5. Capacitance vs. Drain-Source Voltage

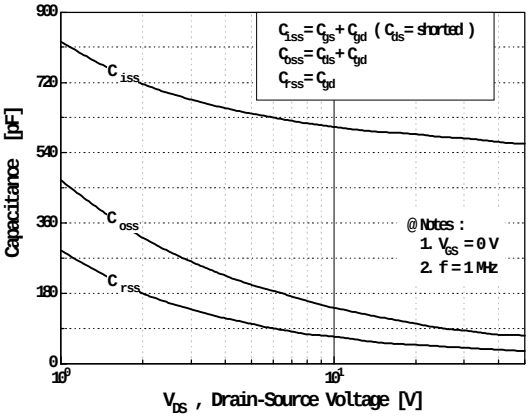


Fig 6. Gate Charge vs. Gate-Source Voltage

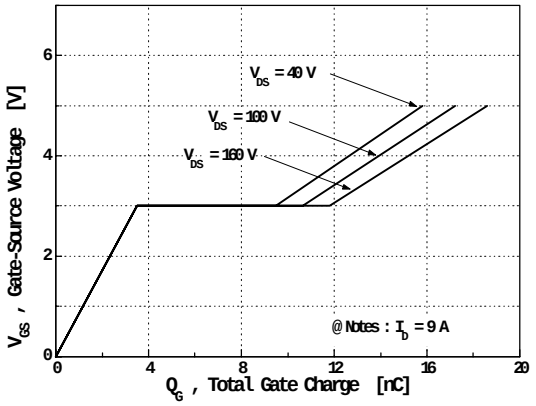


Fig 7. Breakdown Voltage vs. Temperature

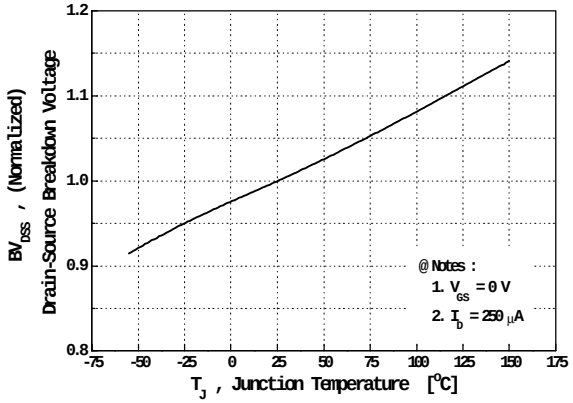


Fig 8. On-Resistance vs. Temperature

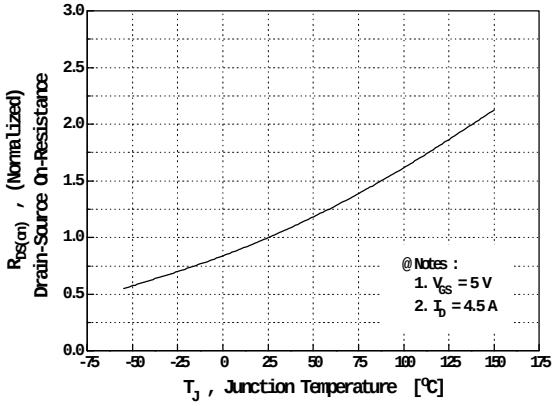


Fig 9. Max. Safe Operating Area

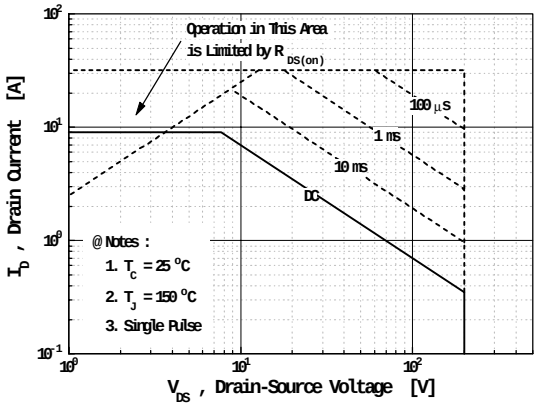


Fig 10. Max. Drain Current vs. Case Temperature

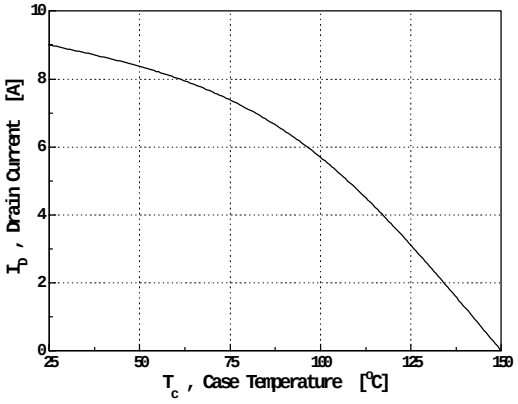


Fig 11. Thermal Response

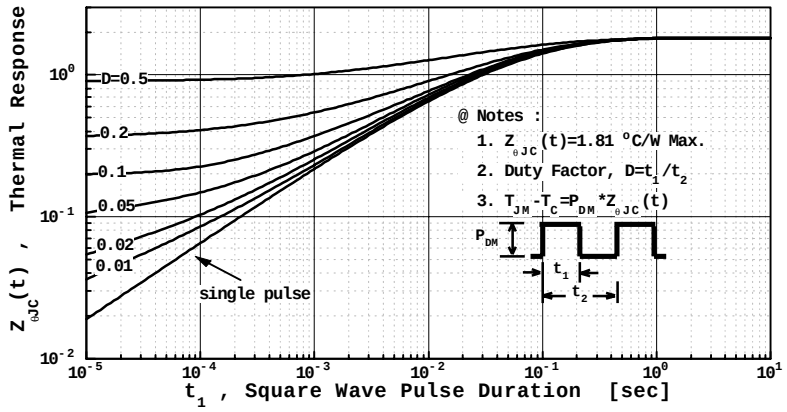


Fig 12. Gate Charge Test Circuit & Waveform

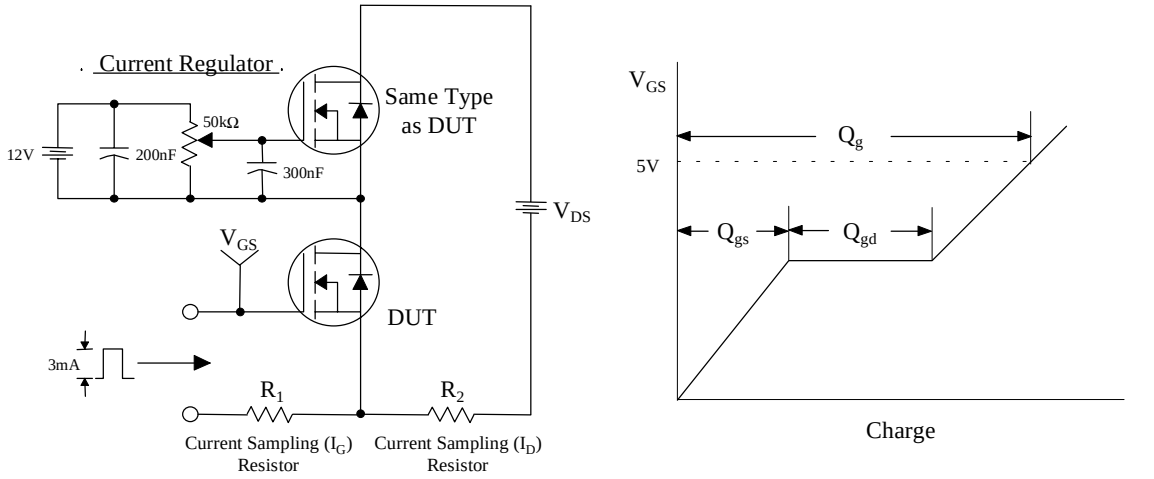


Fig 13. Resistive Switching Test Circuit & Waveforms

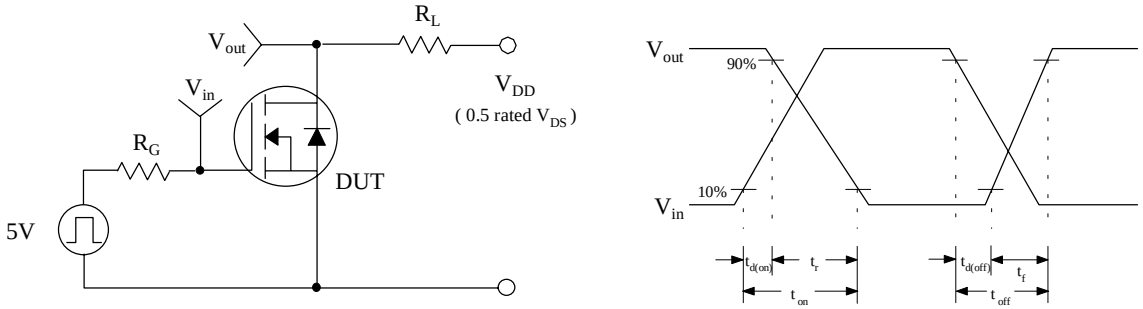


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

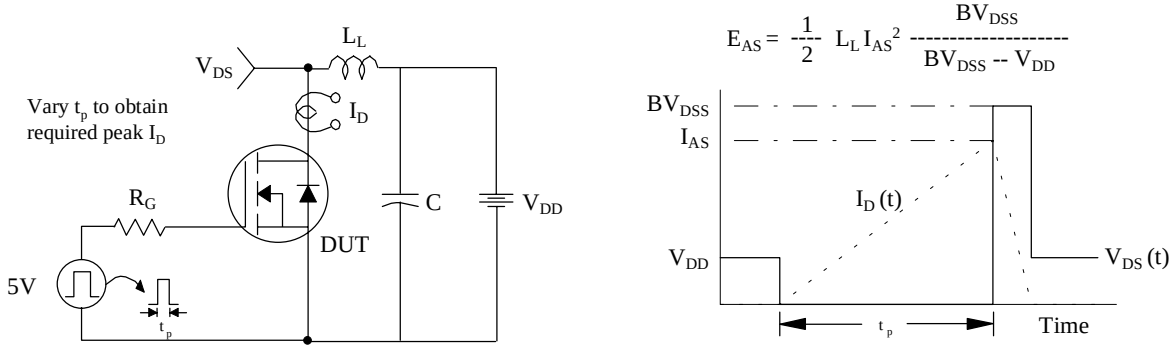
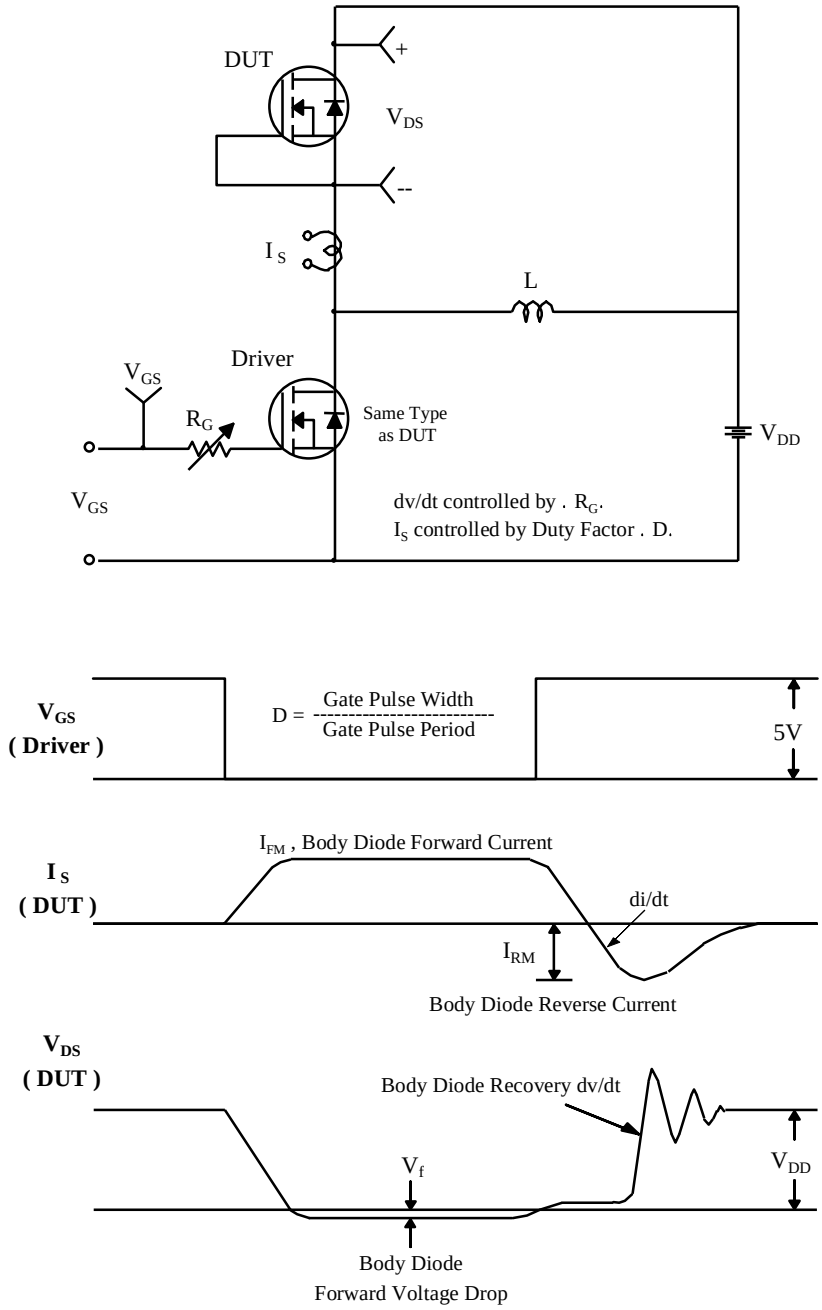


Fig 15. Peak Diode Recovery dv/dt Test Circuit & Waveforms



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2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

PRODUCT STATUS DEFINITIONS

Definition of Terms

Datasheet Identification	Product Status	Definition
Advance Information	Formative or In Design	This datasheet contains the design specifications for product development. Specifications may change in any manner without notice.
Preliminary	First Production	This datasheet contains preliminary data, and supplementary data will be published at a later date. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
No Identification Needed	Full Production	This datasheet contains final specifications. Fairchild Semiconductor reserves the right to make changes at any time without notice in order to improve design.
Obsolete	Not In Production	This datasheet contains specifications on a product that has been discontinued by Fairchild semiconductor. The datasheet is printed for reference information only.

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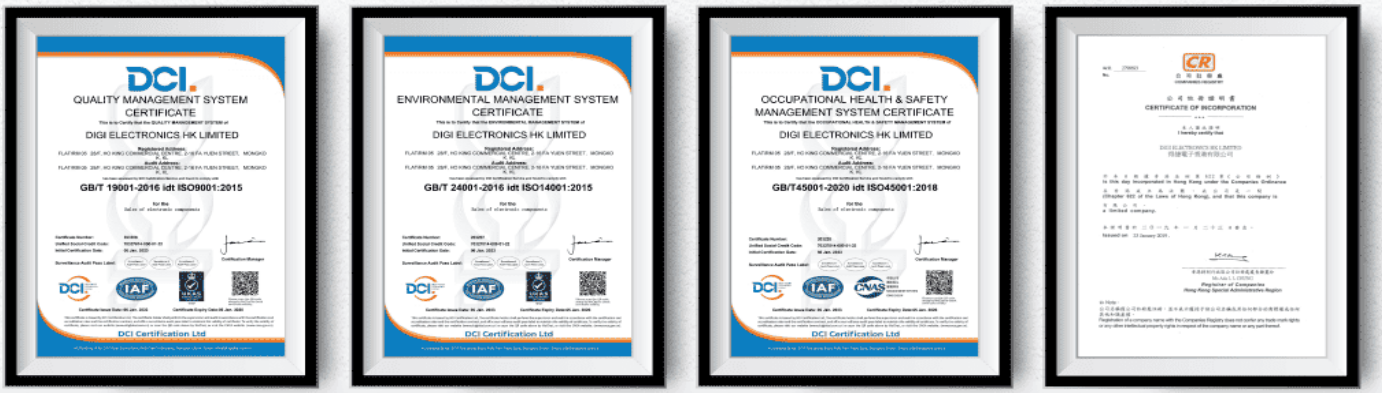

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