MSF6N70

700V N-Channel MOSFET

Description

The MSF6N70 is a N-channel enhancement-mode MOSFET , providing the designer with the best combination of fast switching, ruggedized device design, low on-resistance and cost effectiveness. The TO-220F package is universally preferred for all commercial-industrial applications

Features

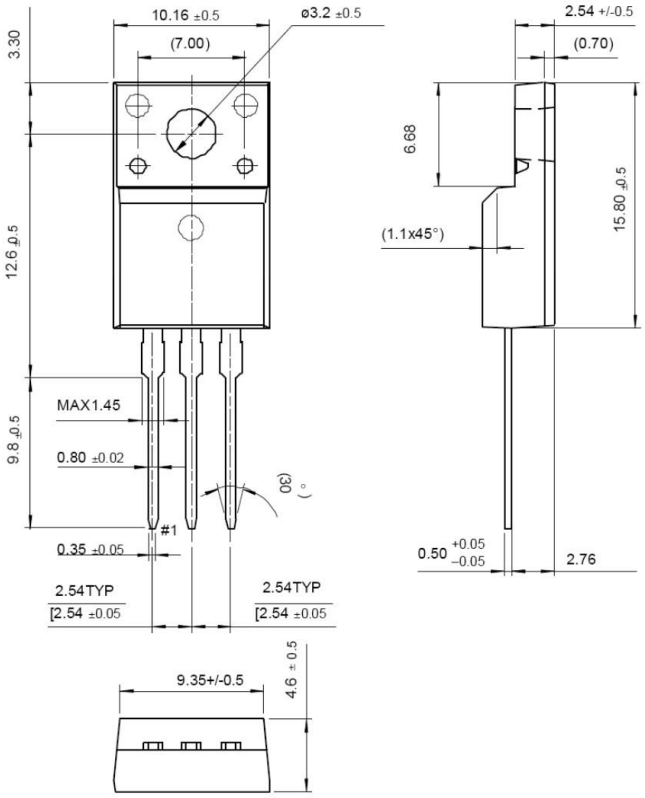
- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant / Halogen free package available

Application

- Adapter
- Switching Mode Power Supply

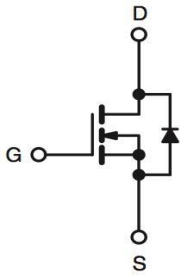
Packing & Order Information

50/Tube ; 1,000/Box



RoHS COMPLIANT

Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

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

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	700	V
V_{GS}	Gate-Source Voltage	±30	V
I_D	Drain Current -Continuous (TC=25°C)	6.0	A
	Drain Current -Continuous (TC=100°C)	3.5	A
I_{DM}	Drain Current Pulsed	22	A
E_{AS}	Single Pulsed Avalanche Energy	350	mJ
E_{AR}	Repetitive Avalanche Energy	14.7	mJ
dv/dt	Peak Diode Recovery dv/dt	5.5	V/ns
P_D	Power Dissipation (TC=25°C)	48	W
	Power Dissipation (TC=100°C)	0.38	W/°C

MSF6N70

700V N-Channel MOSFET

Absolute Maximum Ratings (Tc=25°C unless otherwise noted)			
Symbol	**Parameter**	**Value**	**Unit**
T_J,T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. I_{AS}=5.5A, V_{DD}=50V, L=8mH, V_G=10V, starting TJ=+25°C.
3. I_{SD}≤5.5A, dI/dt≤100A/μs, V_{DD}≤BVDSS, starting TJ=+25°C.
4. Pulse Test : Pulse Width ≤ 300μs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature

Static Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
V_{GS}	V_{DS} = V_{GS}, I_D = 250μA	2.0		4.0	V
*$R_{DS(ON)}$	V_{GS} = 10 V , I_D = 2.8 A	--	1.5	1.8	Ω
BV_{DSS}	V_{GS} = 0 V , I_D = 250μA	700	--	--	V
$\Delta BV_{DSS}/\Delta T_J$	I_D = 250μA, Referenced to 25°C		0.7		
I_{DSS}	V_{DS} = 700 V , V_{GS} = 0 V V_{DS} = 560 V , V_{GS} = 0 V , T_j = 125°C	--	--	1 10	uA
I_{GSSF}	V_{DS} = 30 V, V_{DS} =0 V			100	nA
I_{GSSR}	V_{DS} = -30 V, V_{DS} =0 V	--	--	-100	nA

Dynamic Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
C_{ISS}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0MHz	--	1100	1500	pF
C_{OSS}		--	110	150	pF
C_{RSS}		--	12	16	pF
$t_{d(on)}$	V_{DS} = 350 V, I_D = 5.5 A, R_G = 25 Ω	--	10	30	ns
t_r		--	35	80	ns
$t_{d(off)}$		--	45	100	ns
tf		--	40	90	ns
Q_g	V_{DS} = 560 V,I_D = 5.5 A, V_{GS} = 10 V	--	29	37	nC
Q_{gs}		--	5	--	
Q_{gd}		--	11	--	

MSF6N70

700V N-Channel MOSFET

Source-Drain Diode Characteristics					
Symbol	**Test Conditions**	**Min**	**Typ.**	**Max.**	**Units**
I_S		--	--	5.5	A
I_{SM}		--	--	22	
V_{SD}	IF = 5.5 A , V_{GS} = 0	--	--	1.5	V
t_{rr}	IF = 5.5 A , V_{GS} = 0 , dIF/dt = 100A/μs	--	390	--	ns
Q_{rr}		--	3.6	--	uC

MSF6N70

700V N-Channel MOSFET

■Characteristics Curve

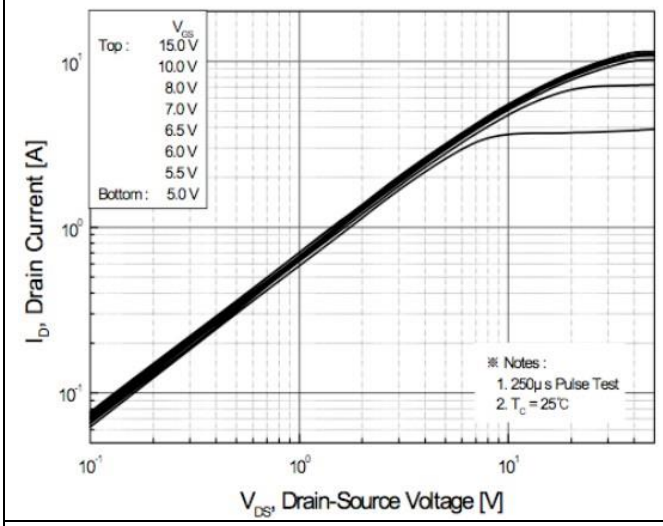


FIG.1-ON REGION CHARACTERISTICS

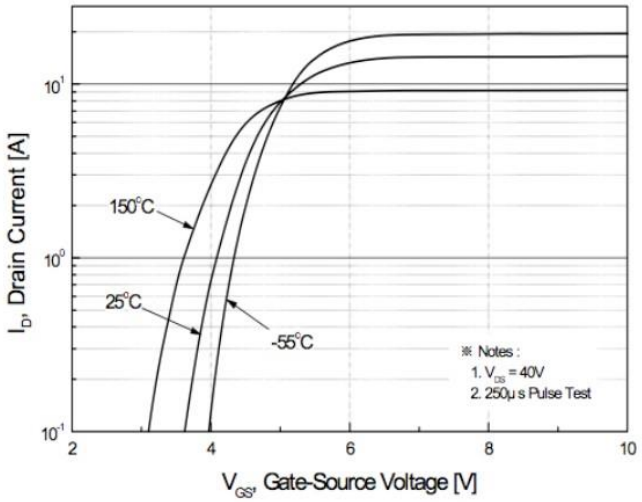


FIG.2-TRANSFER CHARACTERISTICS

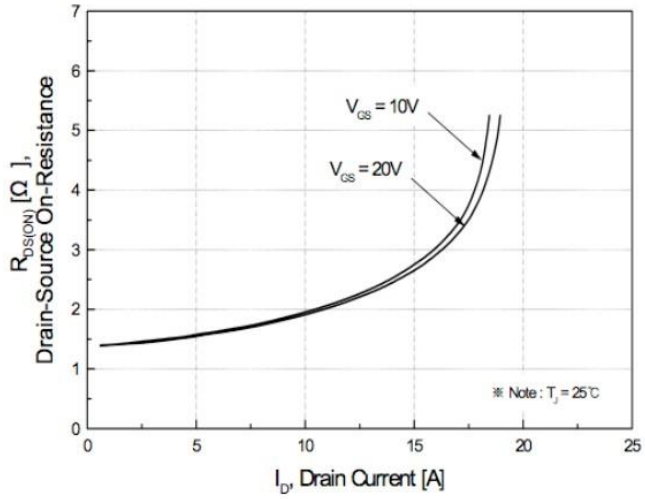


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

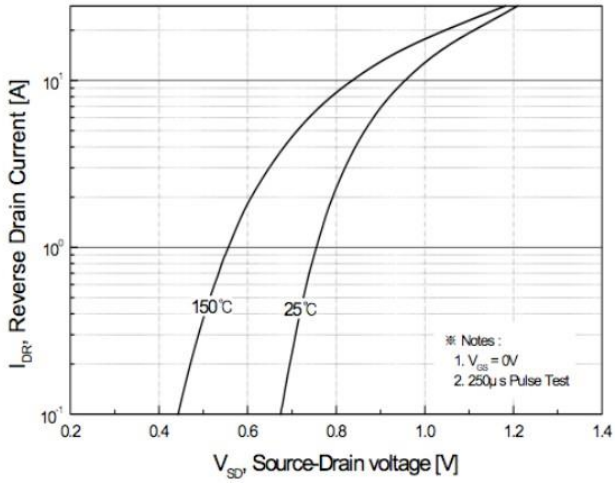


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

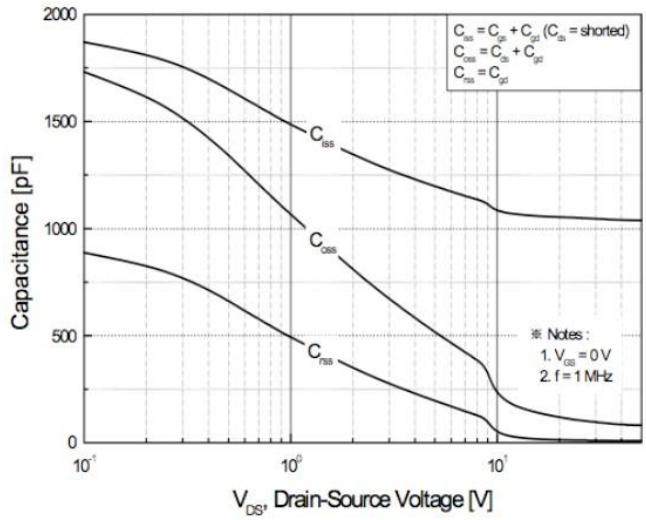


FIG.5-CAPACITANCE CHARACTERISTICS

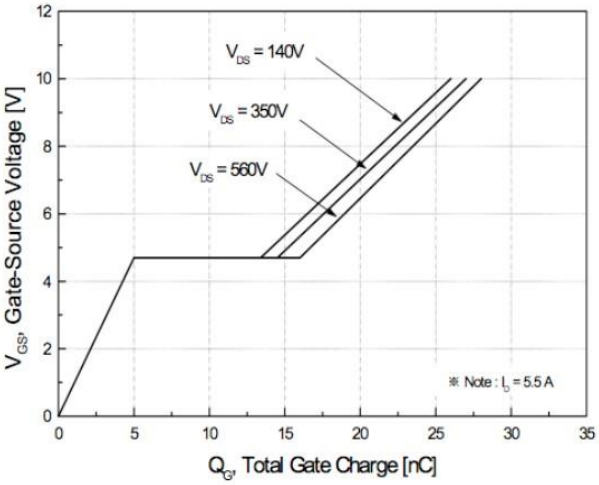


FIG.6-GATE CHARGE CHARACTERISTICS

MSF6N70

700V N-Channel MOSFET

■Characteristics Curve

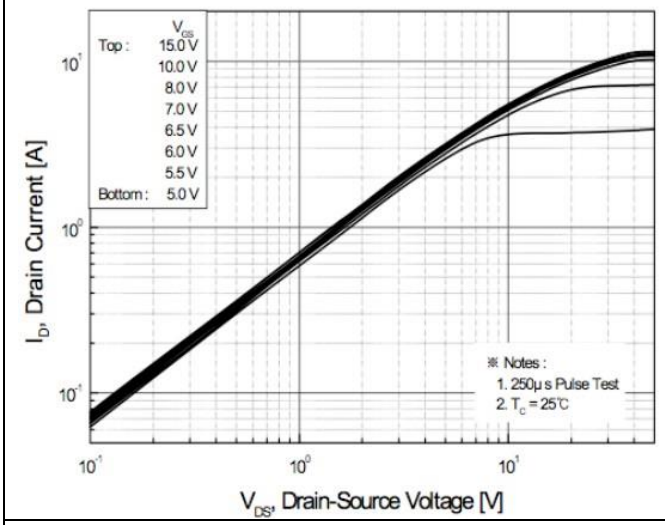


FIG.1-ON REGION CHARACTERISTICS

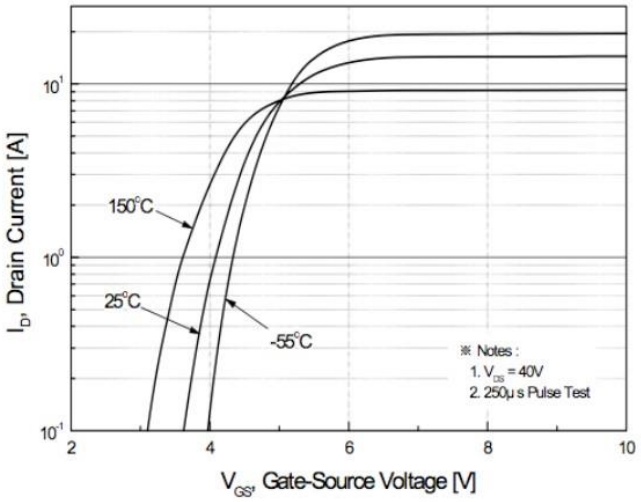


FIG.2-TRANSFER CHARACTERISTICS

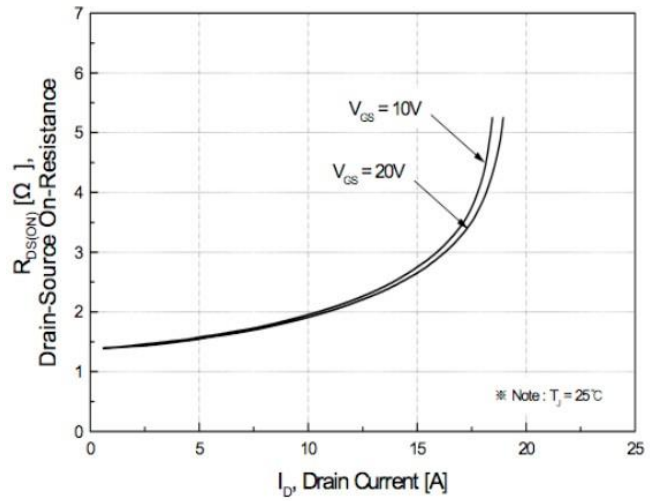


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

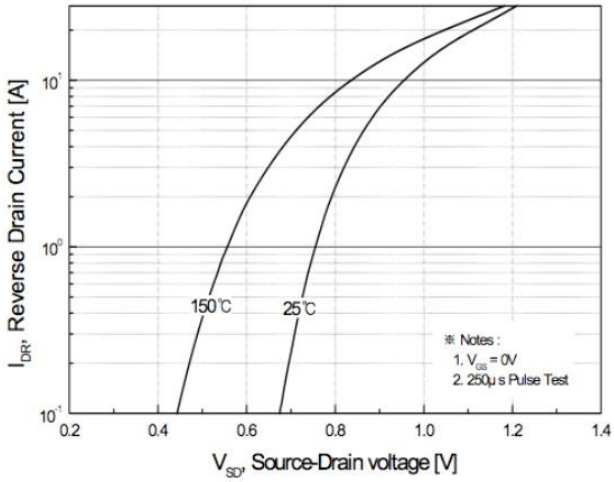


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

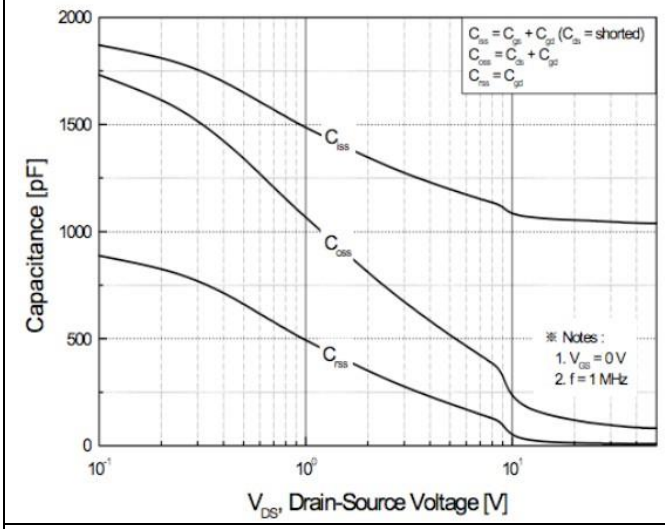


FIG.5-CAPACITANCE CHARACTERISTICS

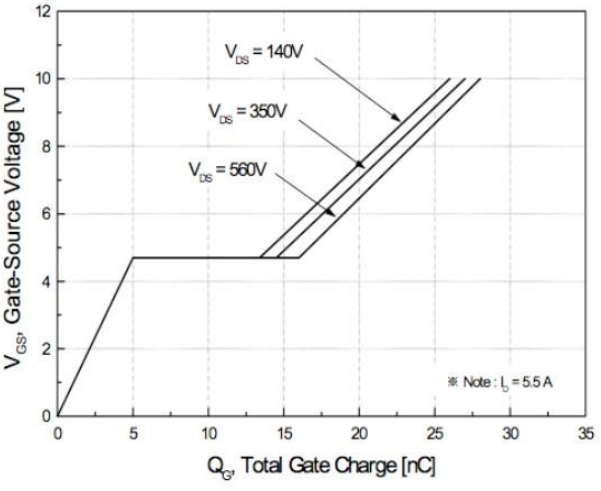


FIG.6-GATE CHARGE CHARACTERISTICS

MSF6N70

700V N-Channel MOSFET

■Characteristics Test Circuit & Waveform

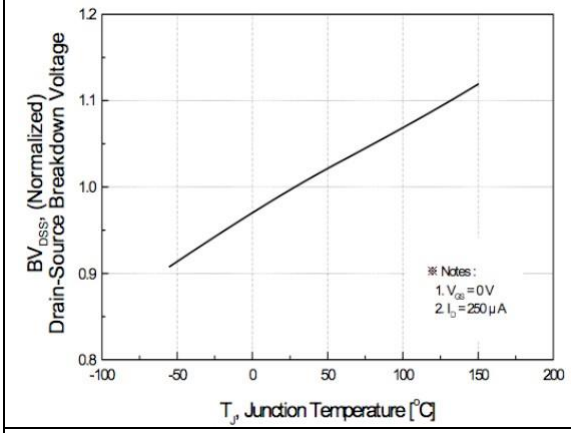


FIG.7-BREAKDOWN VOLTAGE VARIATION VS TEMPERATURE

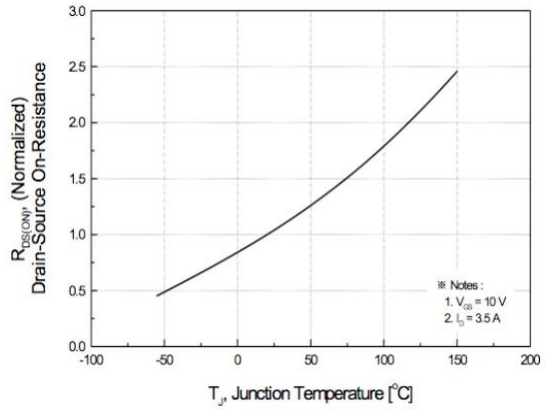


FIG.8-ON-RESISTANCE VARIATION VS TEMPERATURE

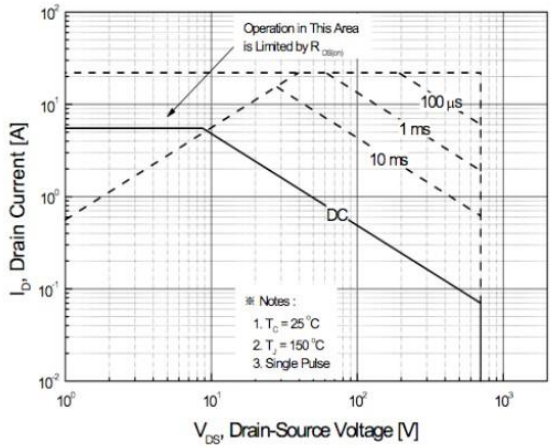


FIG.9-MAXIMUM SAFE OPERATING AREA

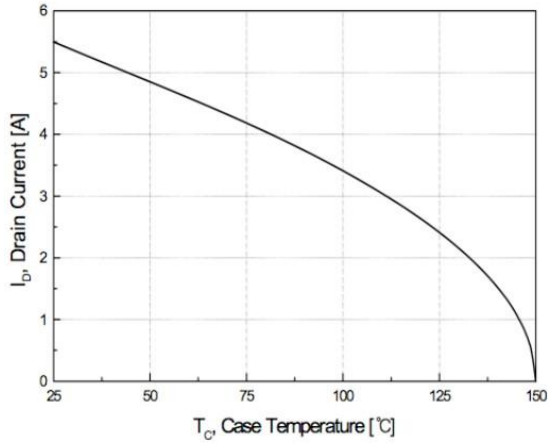


FIG.10-MAXIMUM DRAIN CURRENT VS CASE TEMPERATURE

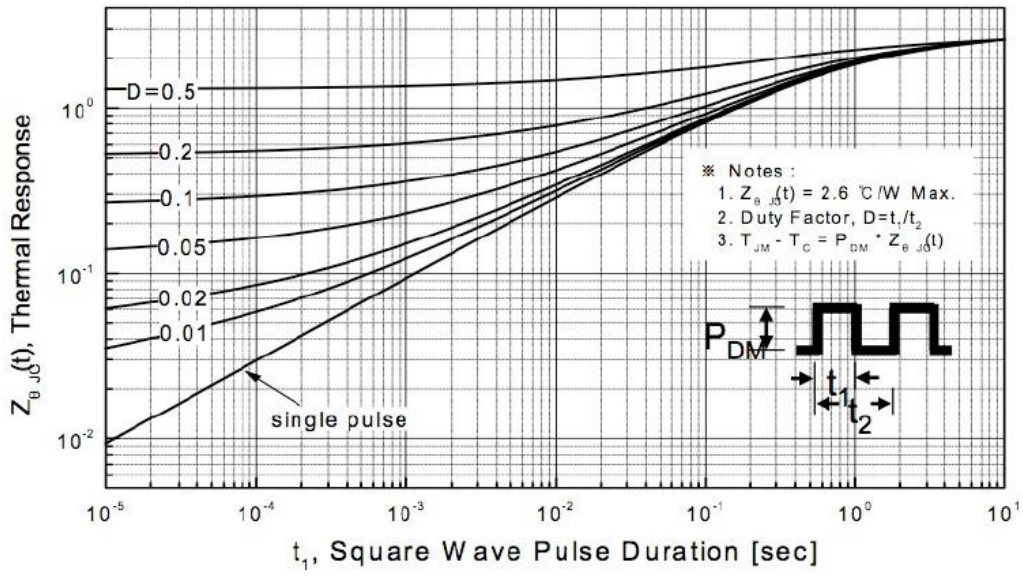


FIG.11-TRANSIENT THERMAL RESPONSE CURVE

MSF6N70

700V N-Channel MOSFET

■Characteristics Test Circuit & Waveform

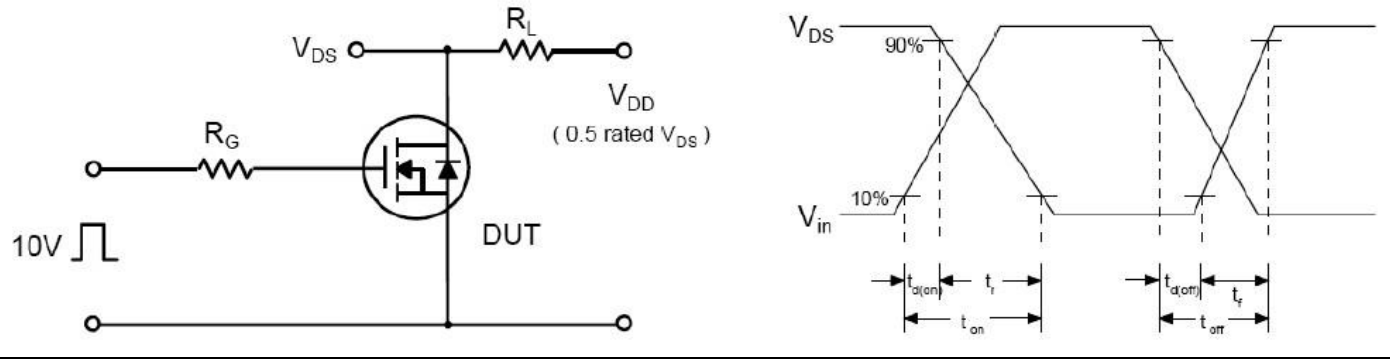


Fig 12. Resistive Switching Test Circuit & Waveforms

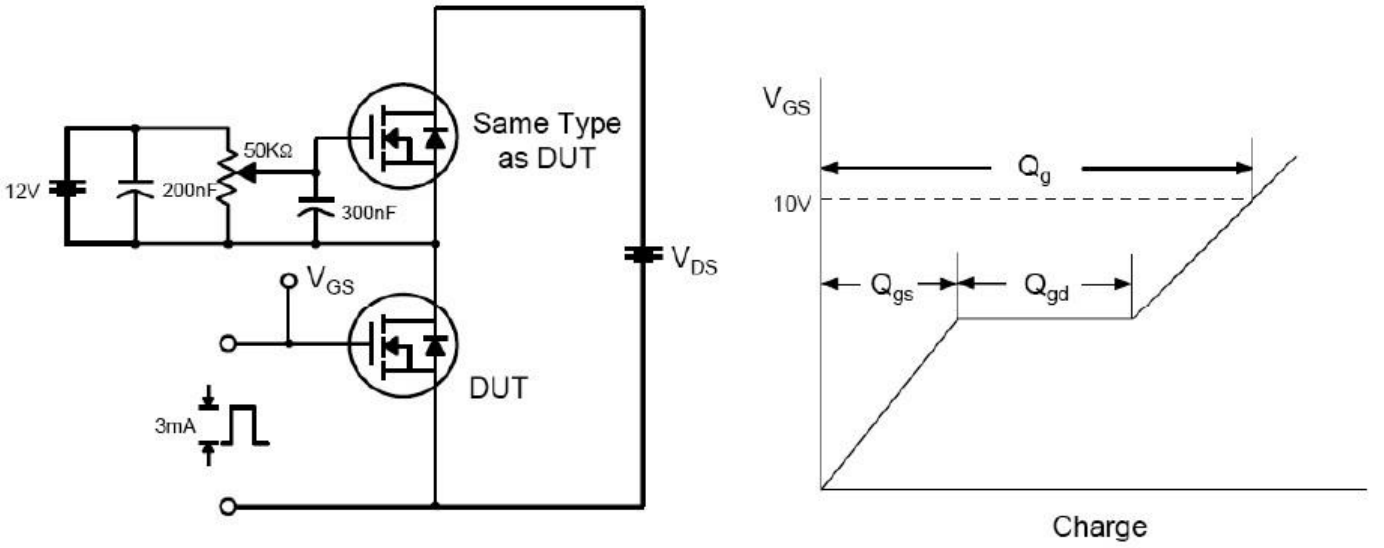


Fig 13. Gate Charge Test Circuit & Waveform

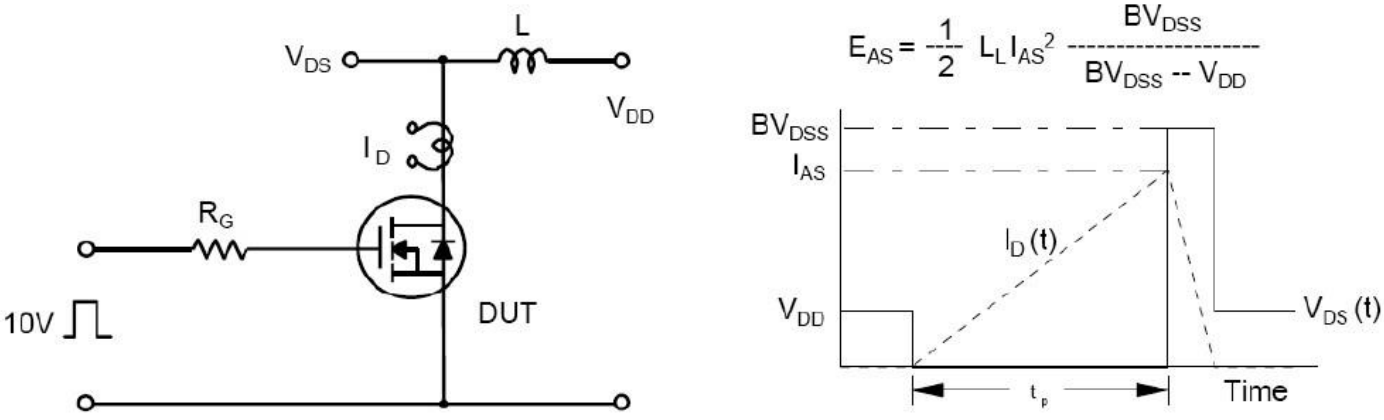


Fig 14. Unclamped Inductive Switching Test Circuit & Waveforms

MSF6N70

700V N-Channel MOSFET

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Bruckewell”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

(i) Any and all liability arising out of the application or use of any product.

(ii) Any and all liability, including without limitation special, consequential or incidental damages.

(iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell’s knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell’s terms and conditions of purchase, including but not limited to the warranty expressed therein.