

MSF6N40

N-Channel Enhancement Mode Power MOSFET

Description

The MSF6N40 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 ITO-220AB package is universally preferred for all commercial-industrial applications

Features

- Low On Resistance
- Simple Drive Requirement
- Low Gate Charge
- Fast Switching Characteristic
- RoHS compliant package

Application

- Adapter
- Switching Mode Power Supply

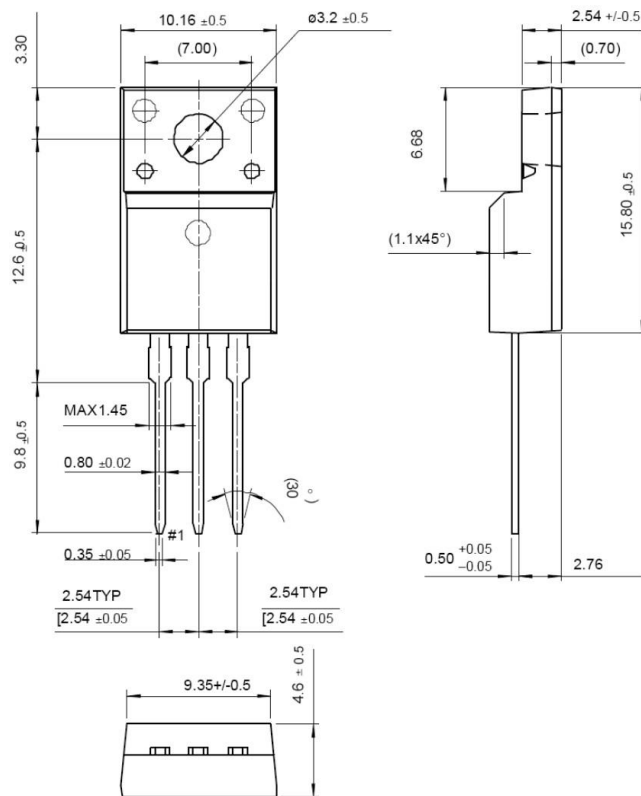
Package type : ITO220-AB

Packing & Order Information

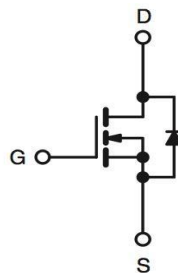
50/Tube ; 1,000/Box



**RoHS
COMPLIANT**



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _{DSS}	Drain-Source Voltage	400	V
V _{GS}	Gate-Source Voltage	±30	V
I _D	Drain Current -Continuous (TC=25°C)	5.5	A
	Drain Current -Continuous (TC=100°C)	3.5	A
I _{DM}	Drain Current Pulsed	16.4	A
E _{AS}	Single Pulsed Avalanche Energy	240	mJ
E _{AR}	Repetitive Avalanche Energy	10	mJ
dv/dt	Peak Diode Recovery dv/dt	5.5	V/ns

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Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	300	°C
TPKG	Maximum Temperature for Soldering @ Package Body for 10 seconds	260	°C
P_D	Total Power Dissipation ($T_C=25^\circ\text{C}$)	38	W
	Derating Factor above 25 °C	0.3	W/°C
T_{STG}	Operating and Storage Temperature Range	-55 to +150	°C
T_J	Storage Temperature	150	°C

Notes ;

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $I_{AS}=5.5\text{A}$, $V_{DD}=50\text{V}$, $L=8\text{mH}$, $V_G=10\text{V}$, starting $T_J=+25^\circ\text{C}$.
3. $I_{SD}\leq 5.5\text{A}$, $di/dt\leq 100\text{A}/\mu\text{s}$, $V_{DD}\leq BVDSS$, starting $T_J=+25^\circ\text{C}$.

Thermal Characteristics

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	3.3	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62.5	

Static Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
V_{GS}	$V_{DS} = V_{GS}$, $I_D = 250\mu\text{A}$	2.0		4.0	V
* $R_{DS(ON)}$	$V_{GS} = 10\text{V}$, $I_D = 2.75\text{A}$	--	0.8	1.0	Ω
BV_{DSS}	$V_{GS} = 0\text{V}$, $I_D = 250\mu\text{A}$	400	--	--	V
$\Delta BV_{DSS} / \Delta T_J$	$I_D = 250\mu\text{A}$, Referenced to 25°C		0.4		
I_{DSS}	$V_{DS} = 400\text{V}$, $V_{GS} = 0\text{V}$	--	--	1	uA
	$V_{DS} = 320\text{V}$, $V_{GS} = 0\text{V}$, $T_J = 125^\circ\text{C}$			10	
I_{GSSF}	$V_{DS} = 30\text{V}$, $V_{GS} = 0\text{V}$			100	nA
I_{GSSR}	$V_{DS} = -30\text{V}$, $V_{GS} = 0\text{V}$	--	--	-100	nA

Dynamic Characteristics

Symbol	Test Conditions	Min	Typ.	Max.	Units
$t_{d(on)}$	$V_{DS} = 200\text{V}$, $I_D = 5.5\text{A}$, $R_G = 25\Omega$	--	20	50	ns
t_r		--	50	110	ns
$t_{d(off)}$		--	90	190	ns
t_f		--	55	120	ns

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Dynamic Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{MHz}$	--	670	870	pF
C_{OSS}		--	95	125	pF
C_{RSS}		--	16	21	pF
Q_g	$V_{DS} = 320\text{ V}, I_D = 5.5\text{ A},$ $V_{GS} = 10\text{ V}$	--	25	33	nC
Q_{gs}		--	5.0	--	
Q_{gd}		--	10.0	--	

Source-Drain Diode Characteristics					
Symbol	Test Conditions	Min	Typ.	Max.	Units
I_S		--	--	5.5	A
I_{SM}		--	--	22	
V_{SD}	$I_F = 5.5\text{ A}, V_{GS} = 0$	--	--	1.5	V
t_{rr}	$I_F = 5.5\text{ A}, V_{GS} = 0, di/dt = 100\text{A}/\mu\text{s}$	--	220	--	ns
Q_{rr}		--	2	--	uC

Notes ;

1. Repetitive Rating : Pulse width limited by maximum junction temperature
2. $I_{AS} = 5.5\text{ A}, V_{DD} = 50\text{V}, R_G = 25\text{W},$ Starting $T_J = 25^\circ\text{C}$
3. $I_{SD} \leq 5.5\text{ A}, di/dt \leq 300\text{A}/\mu\text{s}, V_{DD} \leq BVDSS,$ Starting $T_J = 25^\circ\text{C}$
4. Pulse Test : Pulse Width $\leq 300\mu\text{s},$ Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature

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■ Characteristics Curve

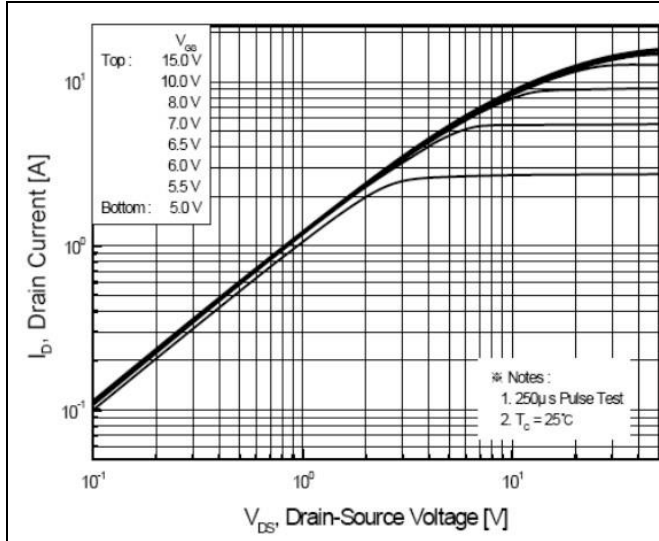


FIG.1-ON REGION CHARACTERISTICS

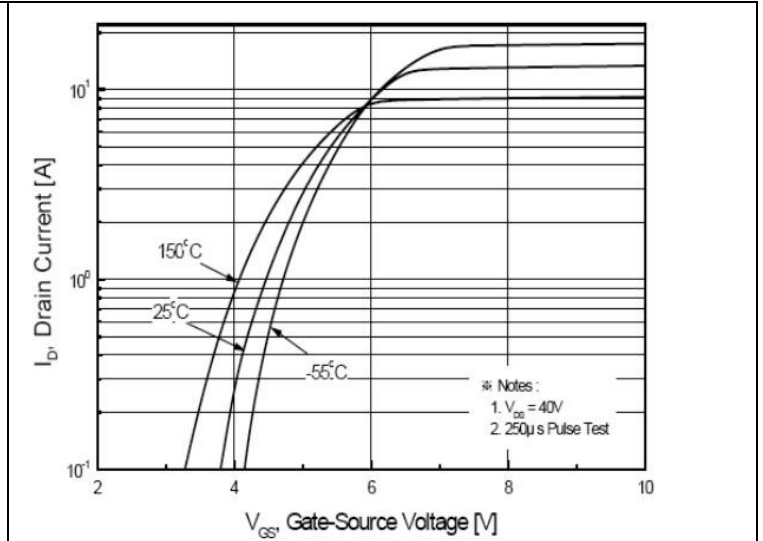


FIG.2-TRANSFER CHARACTERISTICS

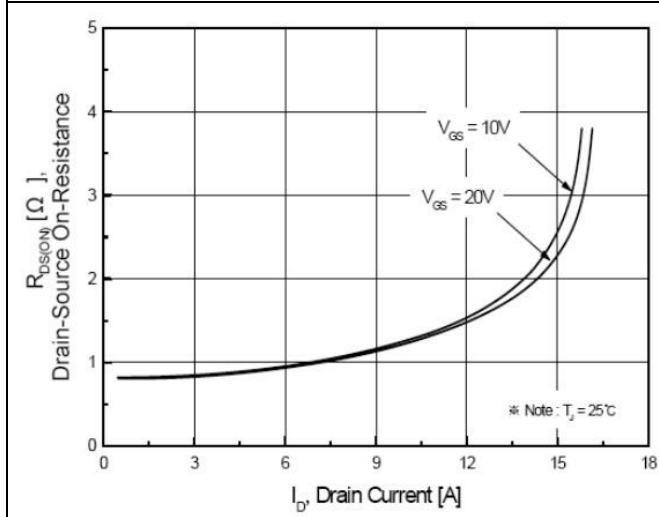


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

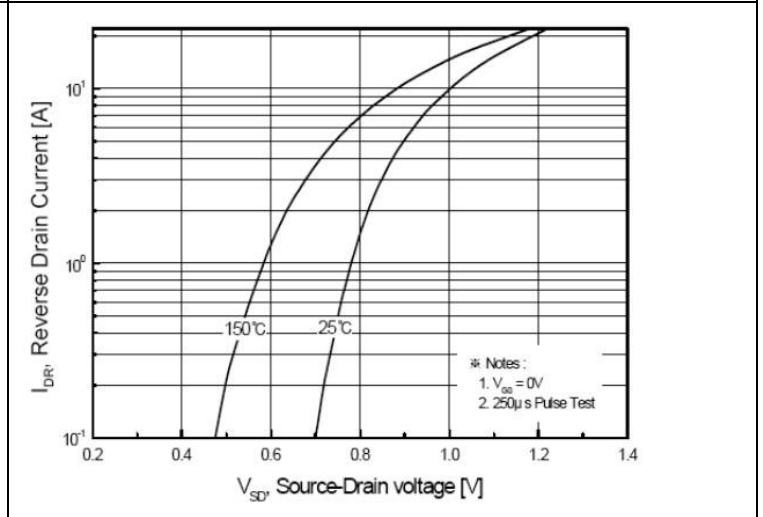


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

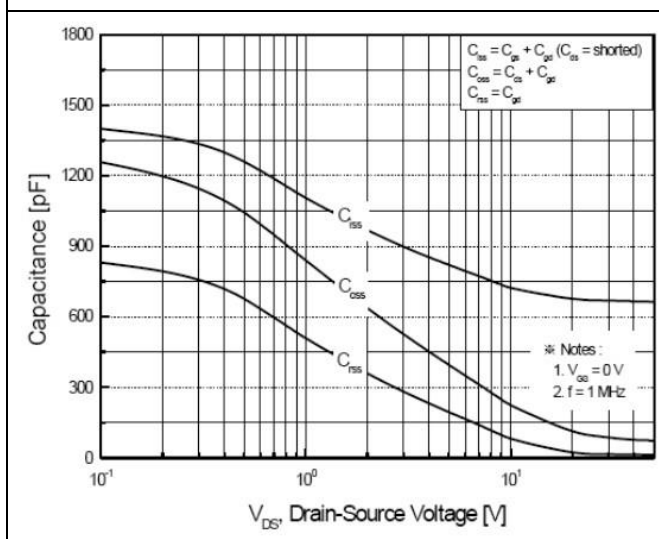


FIG.5-CAPACITANCE CHARACTERISTICS

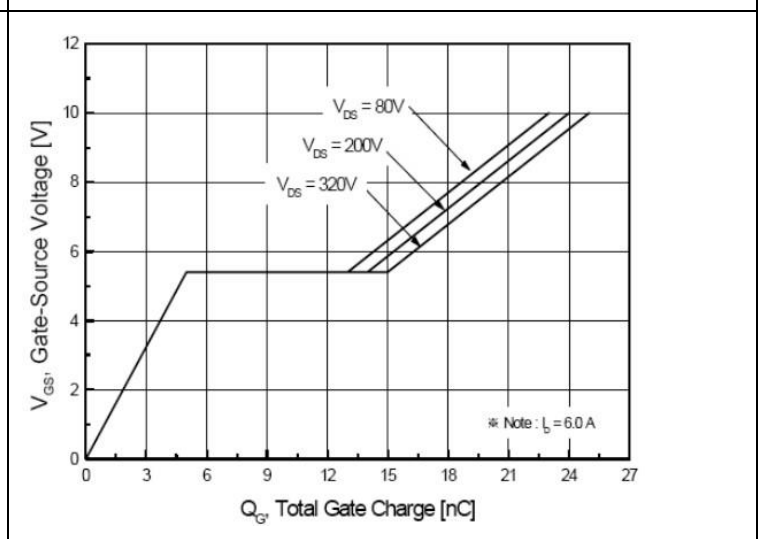
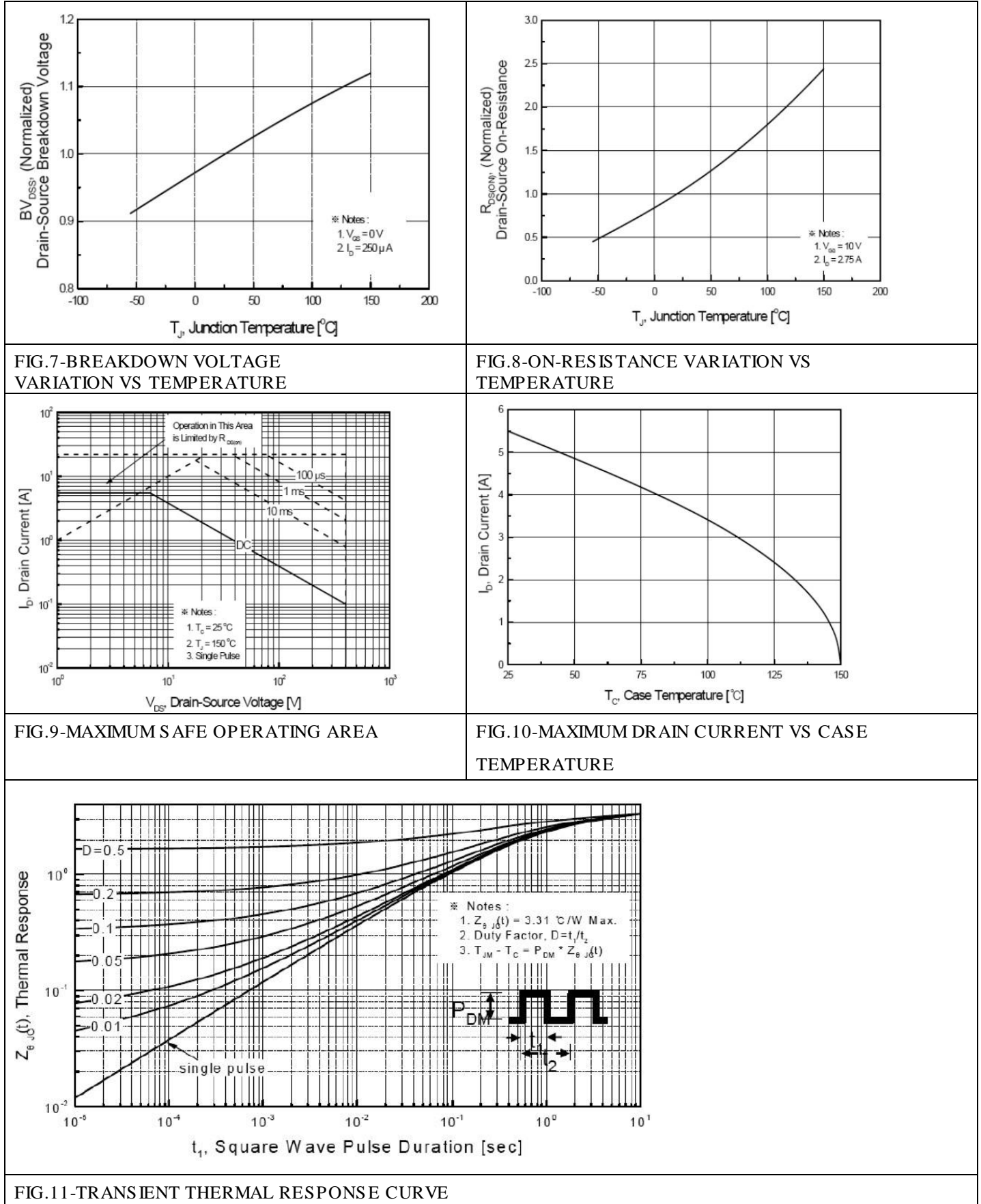


FIG.6-GATE CHARGE CHARACTERISTICS

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■ Characteristics Curve



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