

MSP02N10

N-Channel 100-V (D-S) MOSFET

Features

- Low $r_{DS(on)}$ trench technology
- Low thermal impedance
- Fast switching speed
- RoHS compliant package

Applications:

- PoE Power Sourcing Equipment
- PoE Powered Devices
- Telecom DC/DC converters
- White LED boost converters

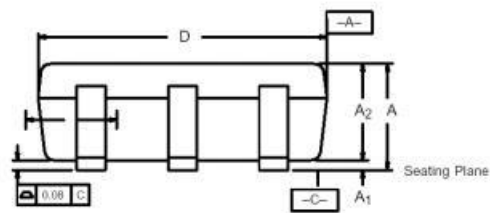
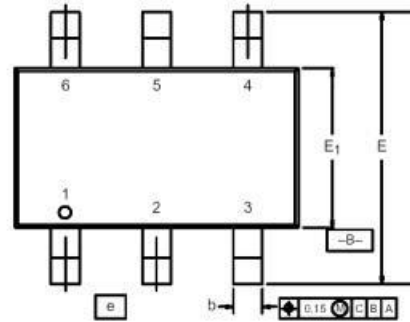
Package type : TOSP-6

Packing & Order Information

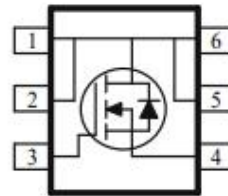
3,000/Reel



RoHS
COMPLIANT



Graphic symbol



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ Unless Otherwise Noted)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current -Continuous ^a ($T_A=25^\circ\text{C}$)	2.2	A
	Drain Current -Continuous ^a ($T_A=70^\circ\text{C}$)	1.8	A
I_{DM}	Pulsed Drain Current ^b	10	A
P_D	Total Power Dissipation ^a ($T_A=25^\circ\text{C}$)	2	W
	Total Power Dissipation ^a ($T_A=70^\circ\text{C}$)	1.3	W
I_S	Continuous Source Current (Diode Conduction) ^a	2.5	A
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$

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Thermal Data

Symbol	Parameter	Max.	Units
$R_{\theta JC}$	Maximum Junction-to-Case ^a ($t \leq 5$ sec)	35	°C/W
$R_{\theta JA}$	Maximum Junction-to- Ambient ^a ($t \leq 5$ sec)	50	

Note:

1. Surface Mounted on 1"x1" FR4 Board.
2. Pulse width limited by maximum junction temperature.

Static

Symbol	Test Conditions	Min	Typ.	Max.	Units
V_{SD}	$V_{GS} = 0$ V , $I_S = 1.3$ A	--	0.77	--	V
$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\mu A$	1	--	3.5	V
I_{DSS}	$V_{DS} = 80$ V , $V_{GS} = 0$ V $V_{DS} = 80$ V , $V_{GS} = 0$ V , $T_J = 55^\circ C$	--	--	1 25	μA
I_{GSS}	$V_{GS} = 20$ V , $V_{DS} = 0$ V	--	--	± 100	nA
$I_{D(ON)}$	$V_{DS} = 5$ V , $V_{GS} = 10$ V	5	--	--	A
$R_{DS(ON)}$	$V_{GS} = 10$ V, $I_D = 1.5$ A $V_{GS} = 4.5$ V, $I_D = 1.4$ A	--	--	280 355	m Ω
$G_{FS} * I$	$V_{DS} = 15$ V, $I_D = 1.5$ A		5		S

Dynamic Characteristics

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
C_{ISS}	Input Capacitance	$V_{DS} = 15$ V , $V_{GS} = 0$ V, $f = 1.0$ MHz	--	1302	--	pF
C_{OSS}	Output Capacitance		--	423	--	pF
C_{RSS}	Reverse Transfer Capacitance		--	171	--	pF
Q_g	Total Gate Charge	$V_{DS} = 50$ V , $I_D = 1.5$ A, $V_{GS} = 4.5$ V	--	11	--	nC
Q_{gs}	Gate-Source Charge		--	6	--	nC
Q_{gd}	Gate-Drain Charge		--	4	--	nC
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = 50$ V , $I_D = 1.5$ A, $R_L = 33.3 \Omega$, $V_{GEN} = 10$ V $R_{GEN} = 6 \Omega$	--	10	--	ns
t_r	Rise Time		--	5	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	22	--	ns
t_f	Fall Time		--	4	--	ns

Notes

- a. Pulse test: $PW \leq 300\mu s$ duty cycle $\leq 2\%$.
- b. Guaranteed by design, not subject to production testing.

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■ Characteristics Curve

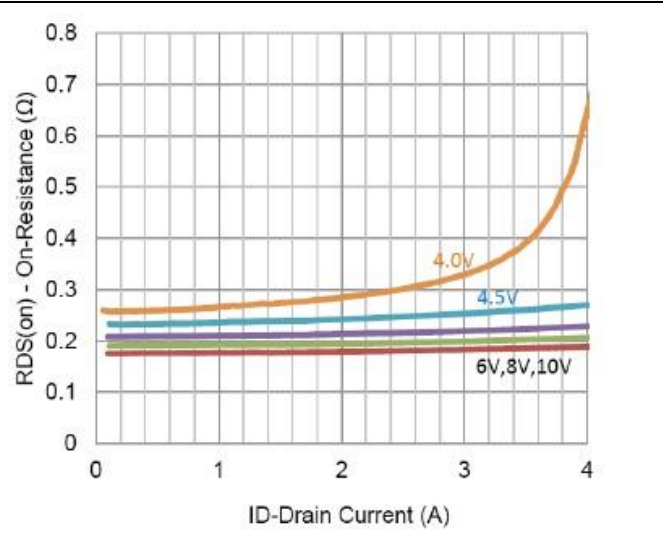


FIG.1-ON REGION CHARACTERISTICS

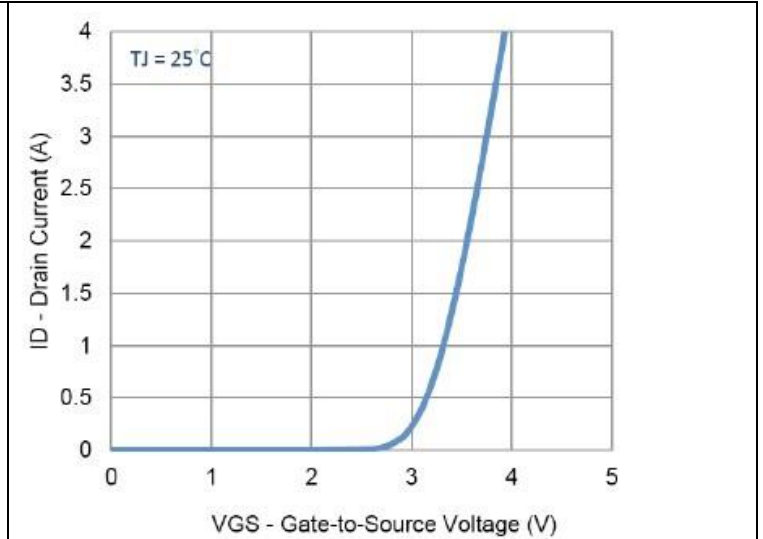


FIG.2-TRANSFER CHARACTERISTICS

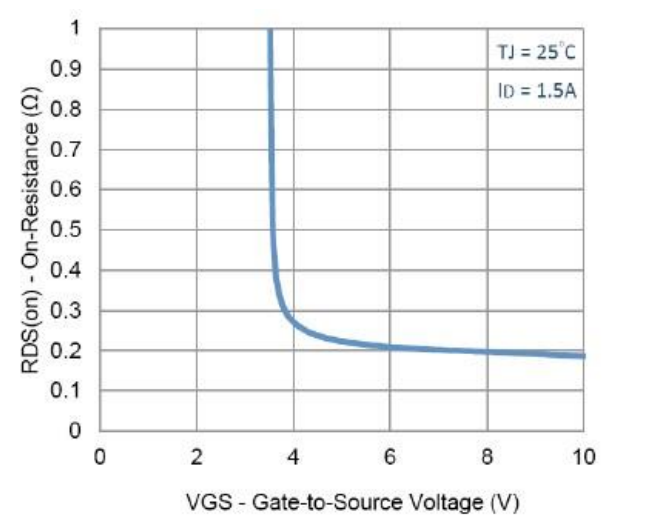


FIG.3-ON RESISTANCE VARIATION VS DRAIN CURRENT AND GATE VOLTAGE

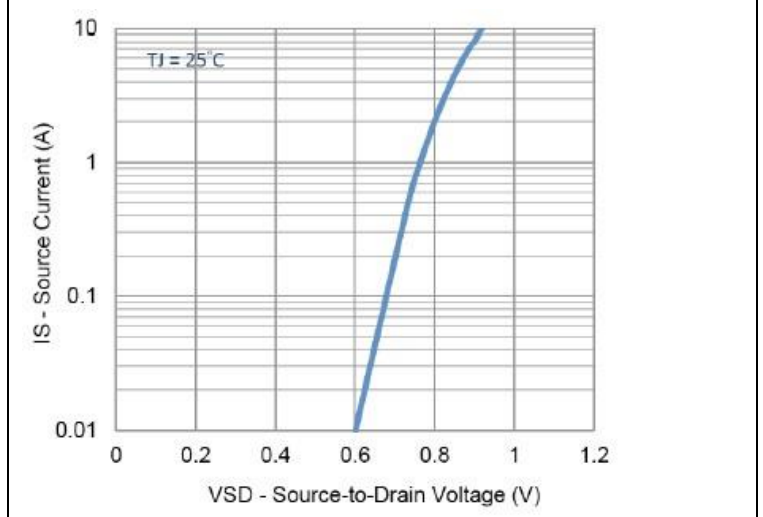


FIG.4-BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE

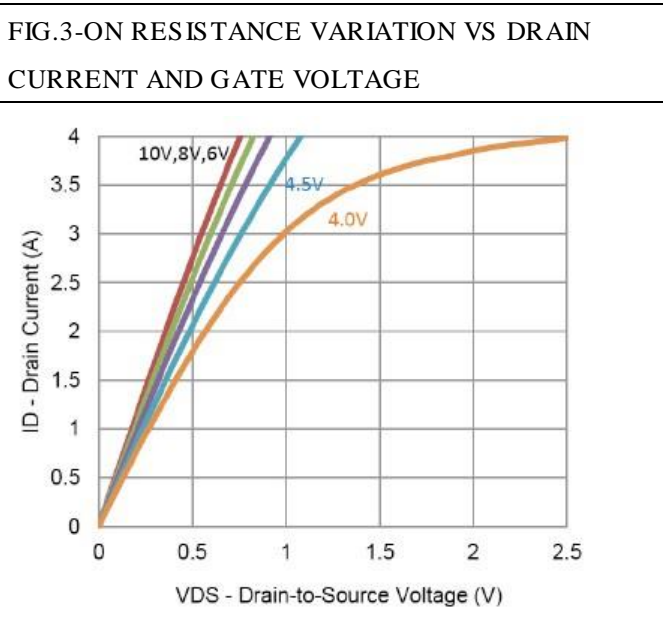


FIG.5-CAPACITANCE CHARACTERISTICS

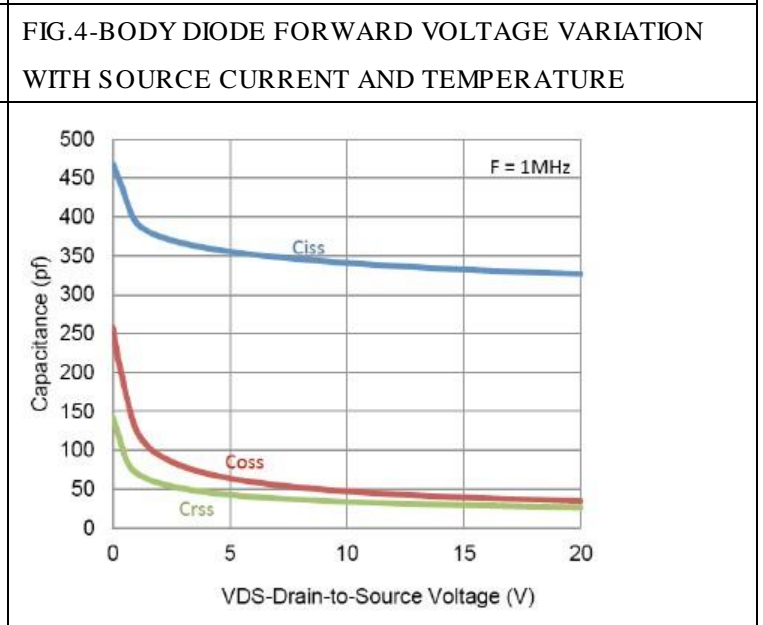
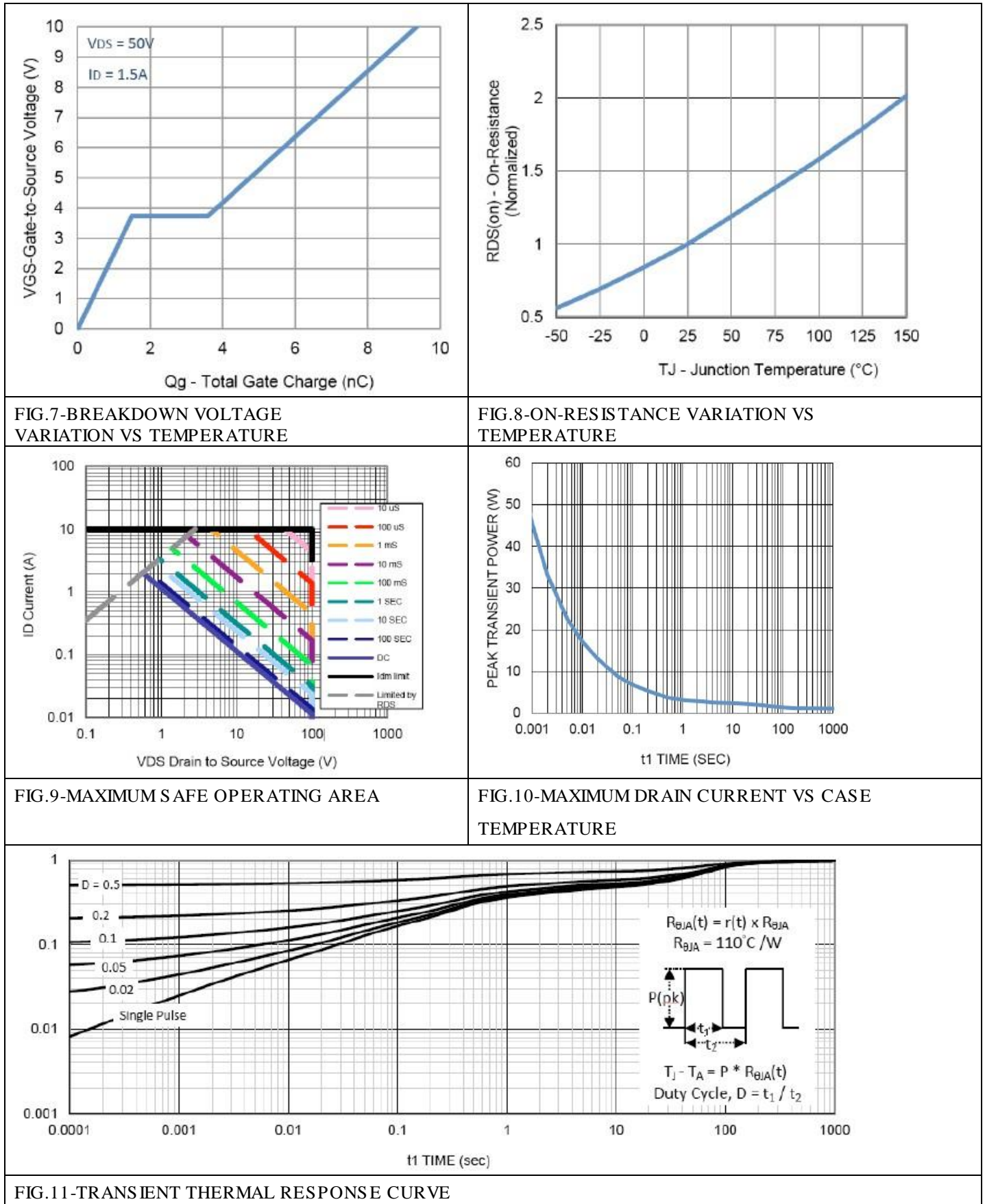


FIG.6-GATE CHARGE CHARACTERISTICS

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■ Characteristics Curve



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