



# THE DATASHEET OF BSS138-7



**SOT23 N-CHANNEL ENHANCED  
MODE VERTICAL DMOS FET**  
ISSUE 3 – MARCH 1996

PARTMARKING DETAIL -SS

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	MIN	MAX
Drain-Source Voltage	$V_{DS}$	-	5
Continuous Drain Current at $T_{amb}=25^{\circ}\text{C}$	$I_{D}$	-	0
Pulsed Drain Current	$I_{D(p)}$	-	0
Gate-Source Voltage	$V_{GS}$	-	1
Power Dissipation at $T_{amb}=25^{\circ}\text{C}$	$P_{D}$	-	1
Operating and Storage Temperature Range	$T_{stg}$	-55	150

**ELECTRICAL CHARACTERISTICS**

PARAMETER	SYMBOL	MIN	MAX
Drain-Source Breakdown Voltage	$BV_{DSS}$	5	-
Gate-Source Threshold Voltage	$V_{GS(th)}$	0	-
Gate-Body Leakage	$I_{GSS}$	-	1
Zero Gate Voltage Drain Current	$I_{DSS}$	-	1
Static Drain-Source On-State Resistance (1)	$R_{DS(on)}$	-	1
Forward Transconductance(1)(2)	$g_{fs}$	1	-
Input Capacitance (2)	$C_{iss}$	-	1
Common Source Output Capacitance (2)	$C_{oss}$	-	1
Reverse Transfer Capacitance (2)	$C_{rss}$	-	1
Turn-On Delay Time (2)(3)	$t_{d(on)}$	-	1
Rise Time (2)(3)	$t_r$	-	1
Turn-Off Delay Time (2)(3)	$t_{d(off)}$	-	1
Fall Time (2)(3)	$t_f$	-	1

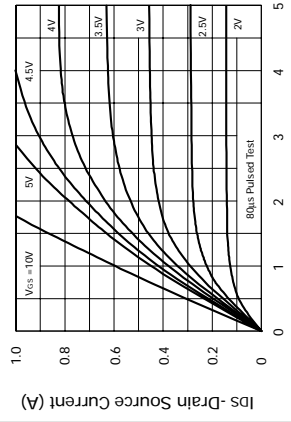
(1) Measured under pulsed conditions. With  $V_{GS} = 0$ .

(2) Measured with  $V_{GS} = 1.5\text{V}$  and  $V_{DS} = 5\text{V}$ .

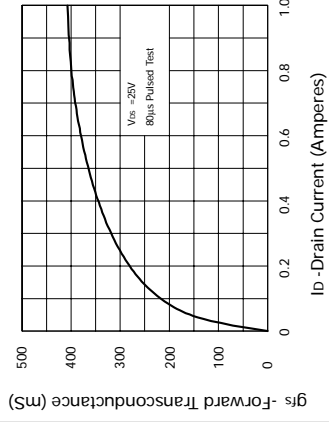
(3) Switching times measured with 500 pF load.

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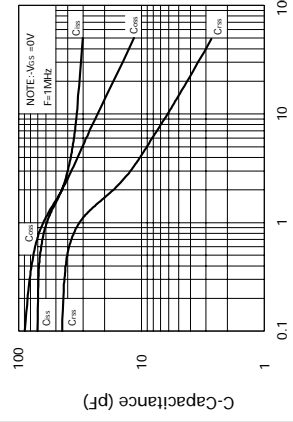
## TYPICAL CHARACTERISTICS



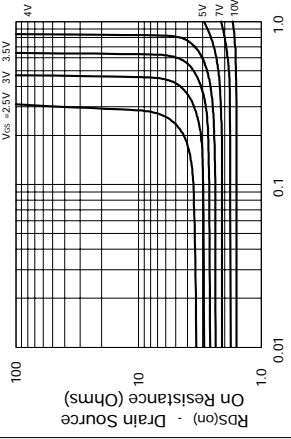
V<sub>ds</sub> -Drain Source Voltage (Volts)  
**Saturation Characteristics**



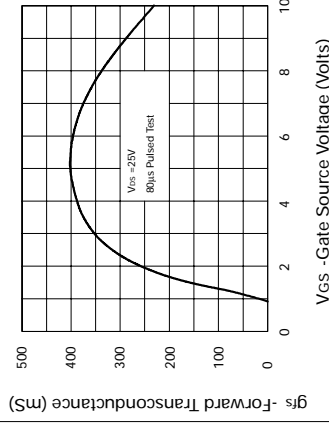
I<sub>d</sub> -Drain Current (Amperes)  
**Typical Transconductance vs. Drain Current**



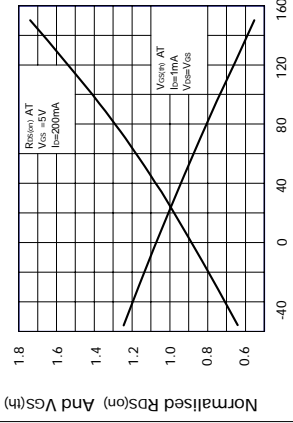
V<sub>ds</sub> -Drain Source Voltage (Volts)  
**Typical Capacitance vs. Drain - Source Voltage**



I<sub>d</sub>-Drain Current (Amperes)  
**Typical On Resistance vs. Drain Current**



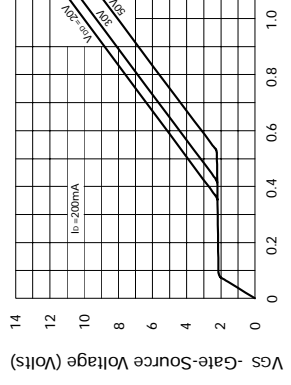
V<sub>gs</sub> -Gate Source Voltage (Volts)  
**Typical Transconductance vs. Gate - Source Voltage**



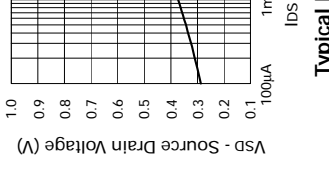
**Normalised R<sub>ds(on)</sub> And V<sub>gs(th)</sub> vs. Temperature**

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## TYPICAL CHARACTERISTICS



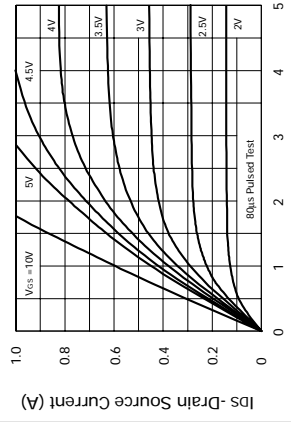
Q-Charge (nC)  
**Typical Gate Charge vs. Gate-Source Voltage**



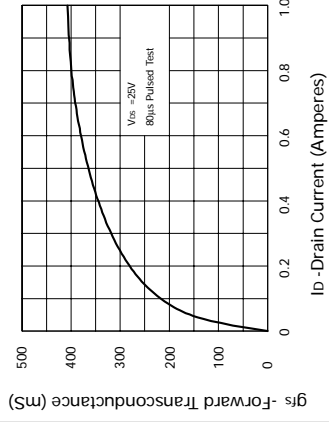
I<sub>ds</sub>  
**Typical**

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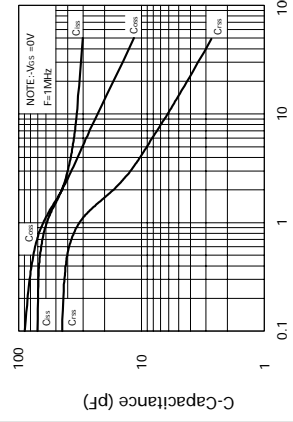
## TYPICAL CHARACTERISTICS



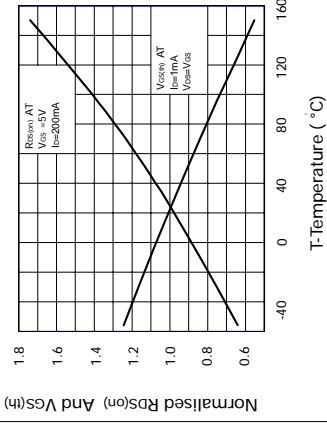
V<sub>ds</sub> -Drain Source Voltage (Volts)  
**Saturation Characteristics**



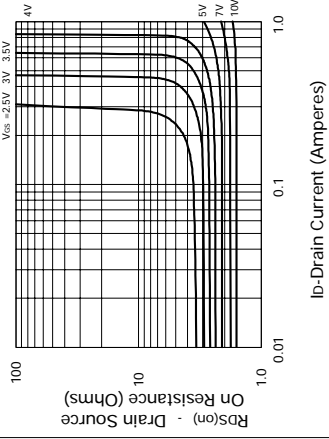
I<sub>d</sub> -Drain Current (Amperes)  
**Typical Transconductance vs. Drain Current**



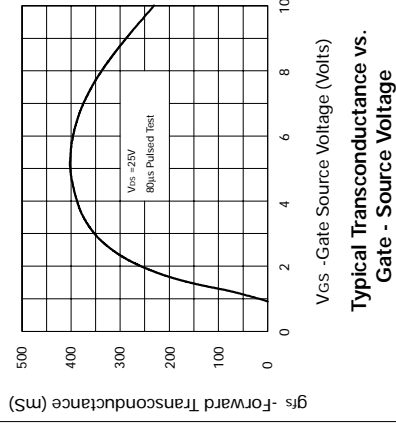
V<sub>ds</sub> -Drain Source Voltage (Volts)  
**Typical Capacitance vs. Drain - Source Voltage**



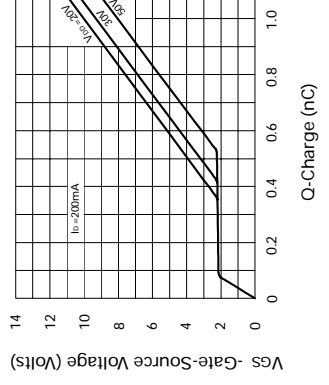
**Normalised R<sub>ds(on)</sub> And V<sub>gs(th)</sub> vs. Temperature**



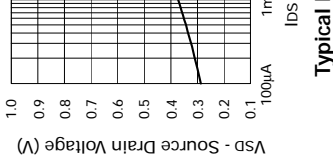
I<sub>d</sub>-Drain Current (Amperes)  
**Typical On Resistance vs. Drain Current**



V<sub>gs</sub> -Gate Source Voltage (Volts)  
**Typical Transconductance vs. Gate - Source Voltage**



**Typical Gate Charge vs. Gate-Source Voltage**





**Typical**

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## TYPICAL CHARACTERISTICS

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