

# G138

## N-CHANNEL ENHANCEMENT MODE POWER MOSFET

BVDSS	50V
RDS(ON)	3.5Ω
ID	500mA

### Description

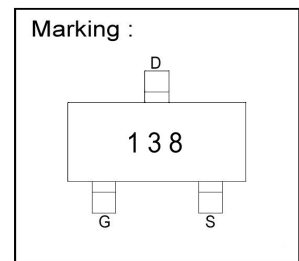
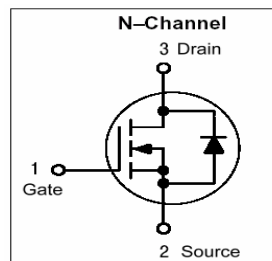
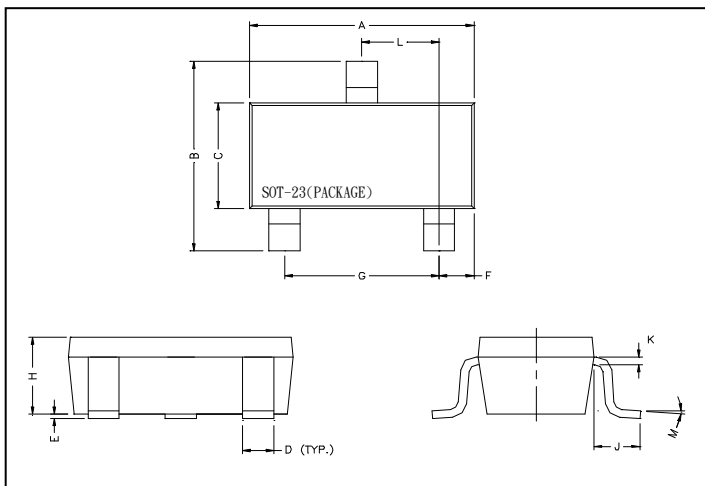
The G138 has been designed to minimize on-state resistance, while provide rugged, reliable and fast switching performance.

The G138 is universally used for all commercial-industrial surface mount applications.

### Features

- \*Simple Drive Requirement
- \*Small Package Outline

### Package Dimensions



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	1.90	REF.
B	2.40	2.80	H	1.00	1.30
C	1.40	1.60	K	0.10	0.20
D	0.35	0.50	J	0.40	-
E	0	0.10	L	0.85	1.15
F	0.45	0.55	M	0°	10°

### Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Drain-Source Voltage	$V_{DS}$	50	V
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current <sup>3</sup> , $V_{GS}@10V$	$I_D @TA=25^{\circ}C$	500	mA
Continuous Drain Current <sup>3</sup> , $V_{GS}@10V$	$I_D @TA=70^{\circ}C$	400	mA
Pulsed Drain Current <sup>1,2</sup>	$I_{DM}$	800	mA
Power Dissipation	$P_D @TA=25^{\circ}C$	225	mW
Linear Derating Factor		0.002	W/°C
Operating Junction and Storage Temperature Range	$T_j, T_{stg}$	-55 ~ +150	°C

### Thermal Data

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-ambient <sup>3</sup> Max.	$R_{thj-a}$	556	°C/W

**Electrical Characteristics (T<sub>j</sub> = 25°C unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	50	-	-	V	V <sub>GS</sub> =0, I <sub>D</sub> =250uA
Gate Threshold Voltage	V <sub>GS(th)</sub>	0.5	-	2.0	V	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =1mA
Forward Transconductance	g <sub>fs</sub>	-	500	-	mS	V <sub>DS</sub> =10V, I <sub>D</sub> =220mA
Gate-Source Leakage Current	I <sub>GSS</sub>	-	-	±100	nA	V <sub>GS</sub> = ±20V
Drain-Source Leakage Current(T <sub>j</sub> =25°C)	I <sub>DSS</sub>	-	-	1	uA	V <sub>DS</sub> =50V, V <sub>GS</sub> =0
Static Drain-Source On-Resistance	R <sub>DS(ON)</sub>	-	-	3.5	Ω	V <sub>GS</sub> =10V, I <sub>D</sub> =220mA
		-	-	6.0		V <sub>GS</sub> =4.5V, I <sub>D</sub> =220mA
Input Capacitance	C <sub>iss</sub>	-	-	50	pF	V <sub>GS</sub> =0V V <sub>DS</sub> =25V f=1.0MHz
Output Capacitance	C <sub>oss</sub>	-	-	25		
Reverse Transfer Capacitance	C <sub>rss</sub>	-	-	5		

**Source-Drain Diode**

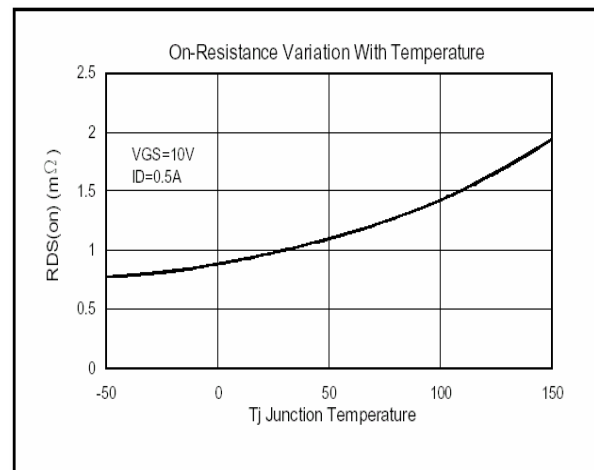
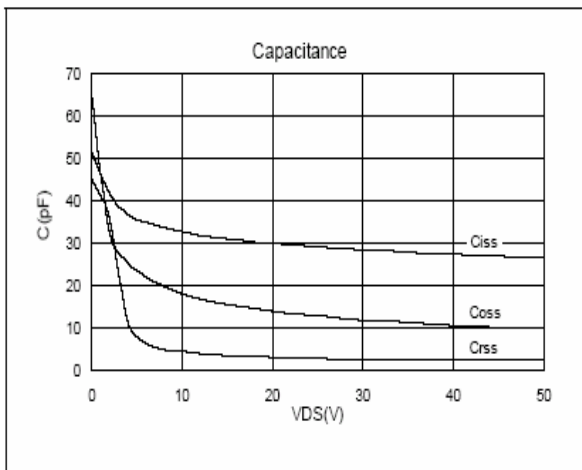
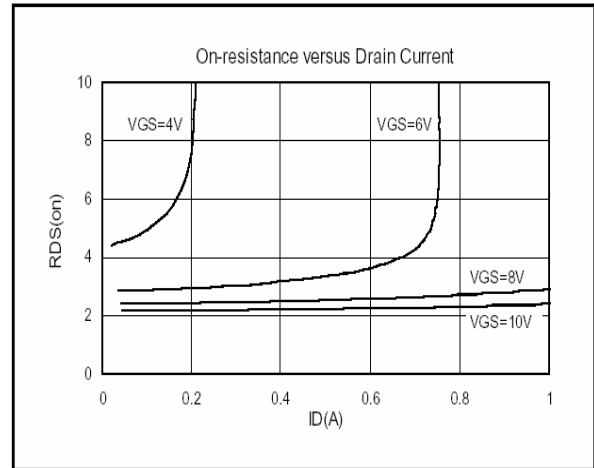
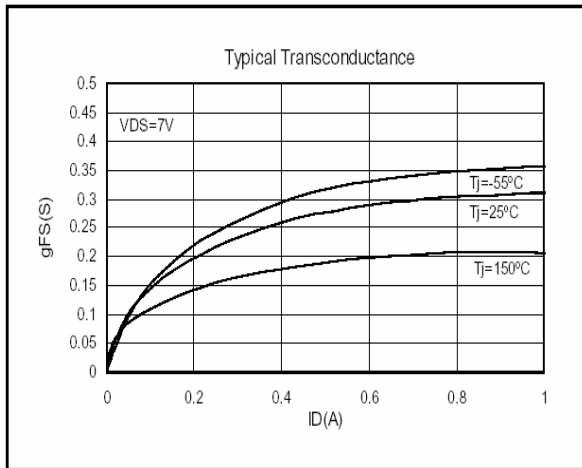
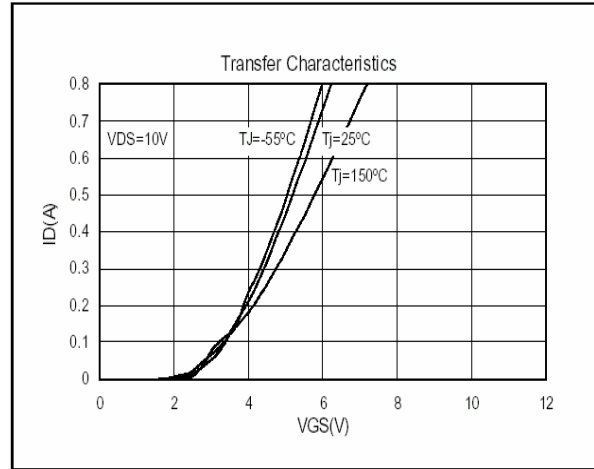
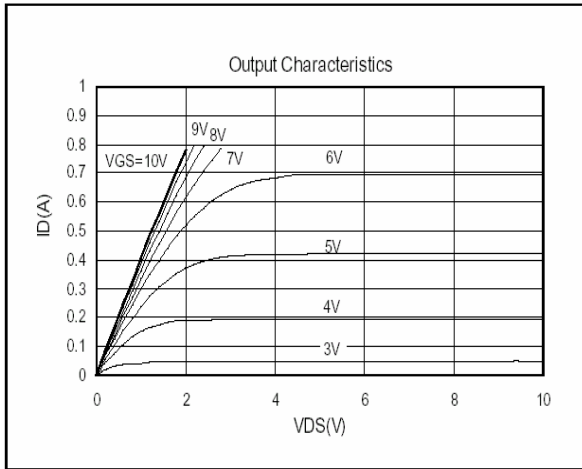
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Forward On Voltage <sup>2</sup>	V <sub>SD</sub>	-	-	1.5	V	I <sub>S</sub> =100mA, V <sub>GS</sub> =0V

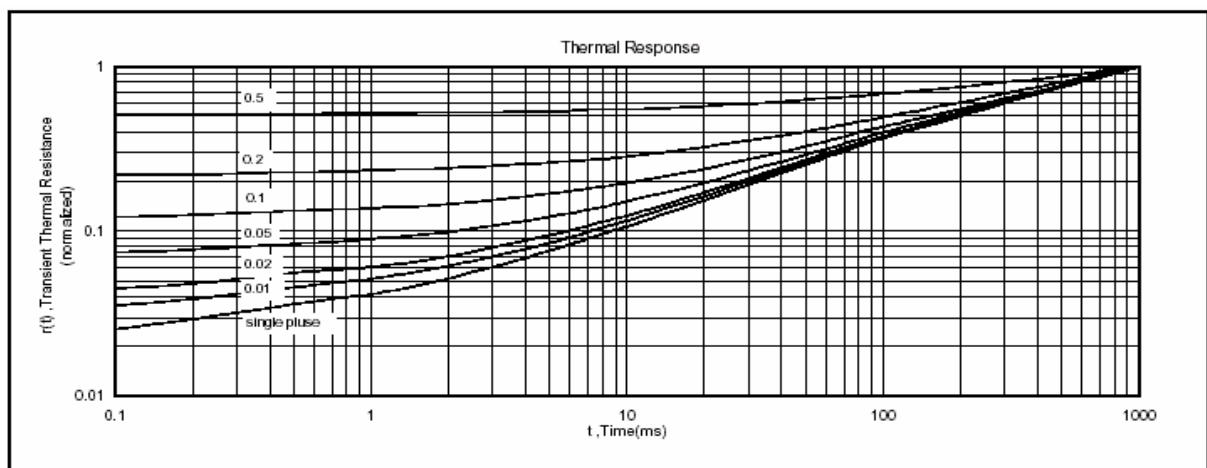
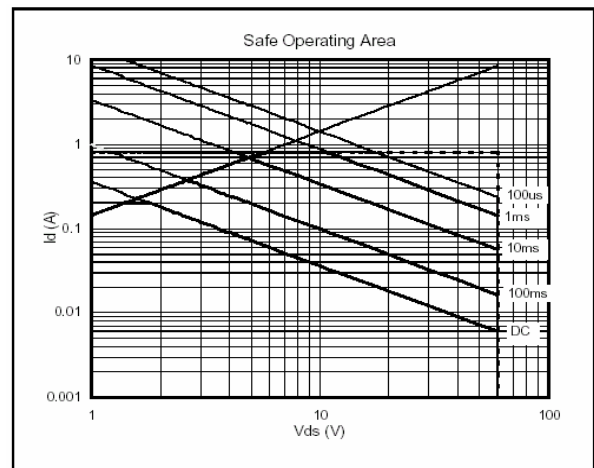
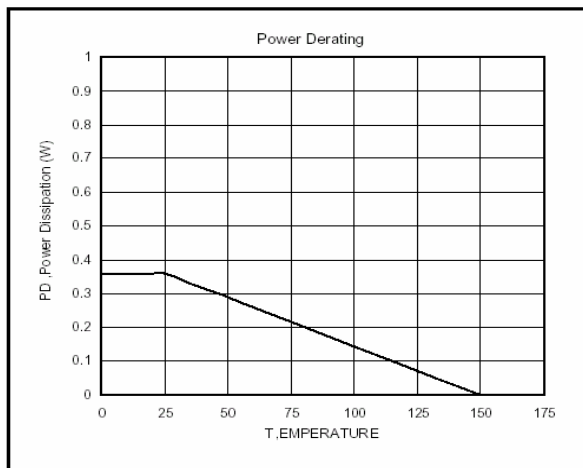
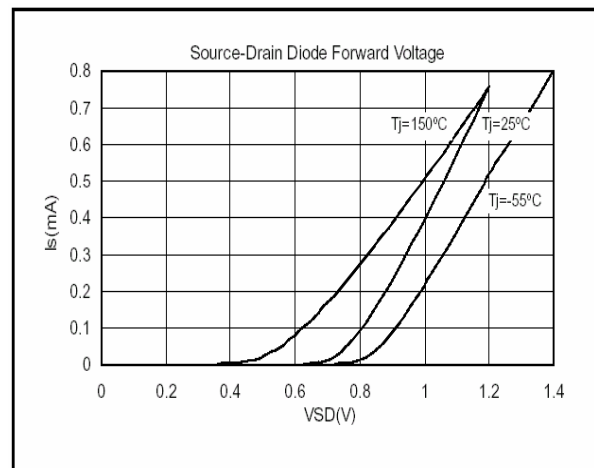
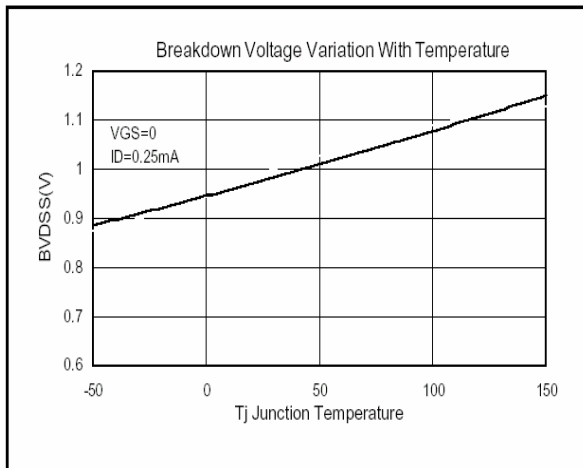
Notes: 1. Pulse width limited by Max. junction temperature.

2. Pulse width ≤ 300us, duty cycle ≤ 2%.

3. Surface mounted on 1 in<sup>2</sup> copper pad of FR4 board; 270°C/W when mounted on Min. copper pad.

## Characteristics Curve





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