

## N-CHANNEL ENHANCEMENT MODE FIELD EFFECT TRANSISTOR

**VOLTAGE** 60 Volts

**CURRENT** 115 mAmp

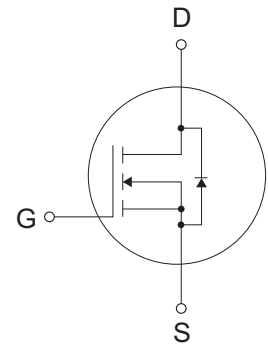
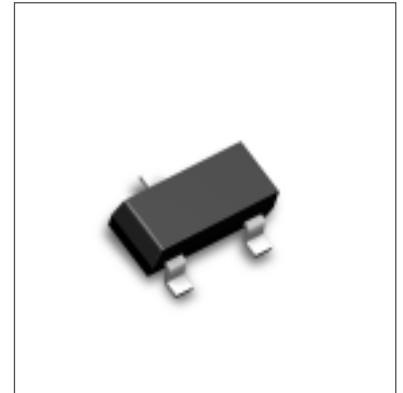
**PACKAGE** SOT-23

### DESCRIPTION

• N-channel enhancement mode field effect transistor, designed for high speed pulsed amplifier and driver applications, which is manufactured by the N-Channel DMOS process.

### FEATURES

- High density cell design for low  $R_{DS(ON)}$ .
- Voltage controlled small signal switching.
- Rugged and reliable.
- High saturation current capability.
- High-speed switching.
- CMOS logic compatible input.
- Not thermal runaway.
- No secondary breakdown.



### ABSOLUTE MAXIMUM RATINGS

$T_A = 25^\circ\text{C}$  Unless otherwise noted.

Parameter	Symbol	2N7002	Units
Drain-Source Voltage	$V_{DSS}$	60	V
Drain-Gate Voltage ( $R_{gs} \leq 1\text{M}\Omega$ )	$V_{DRG}$	60	V
Gate Source Voltage -Continuous -No Repetitive ( $t_p < 50\mu\text{s}$ )	$V_{GSS}$	$\pm 20$ $\pm 20$	V
Maximum Drain Current -Continuous -Pulsed	$I_D$	115 800	mA
Maximum POver Dissipation Derated Above $25^\circ\text{C}$	$P_D$	200	mW
Operation and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	625	$^\circ\text{C} / \text{W}$

## ELECTRICAL CHARACTERISTICS

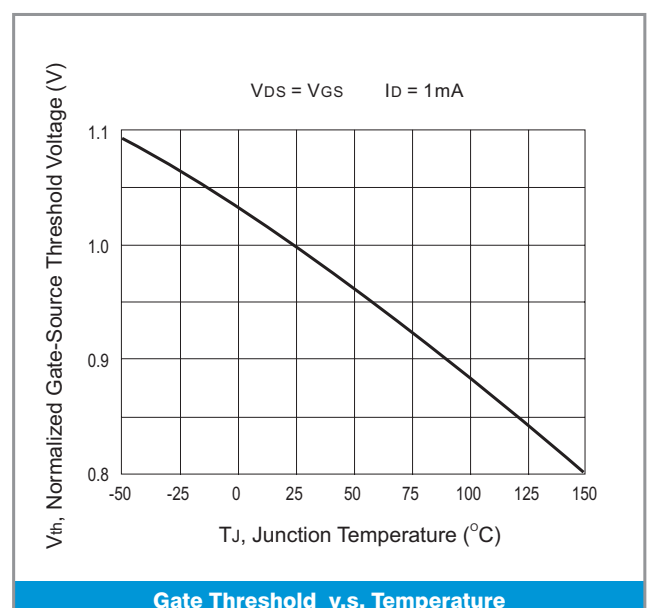
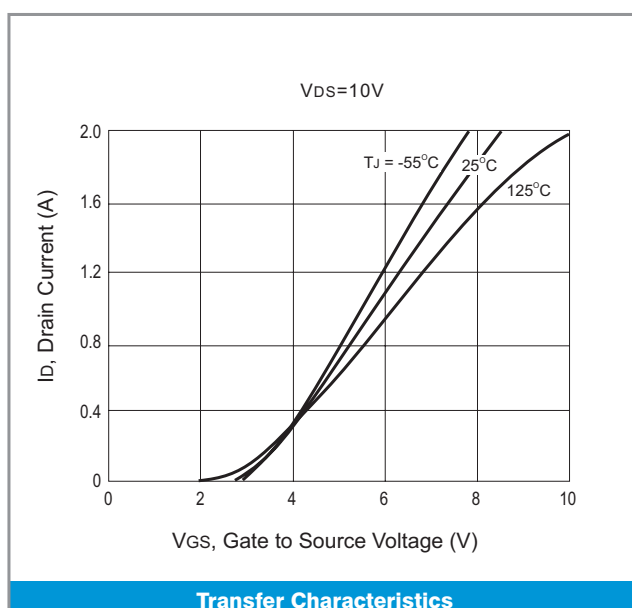
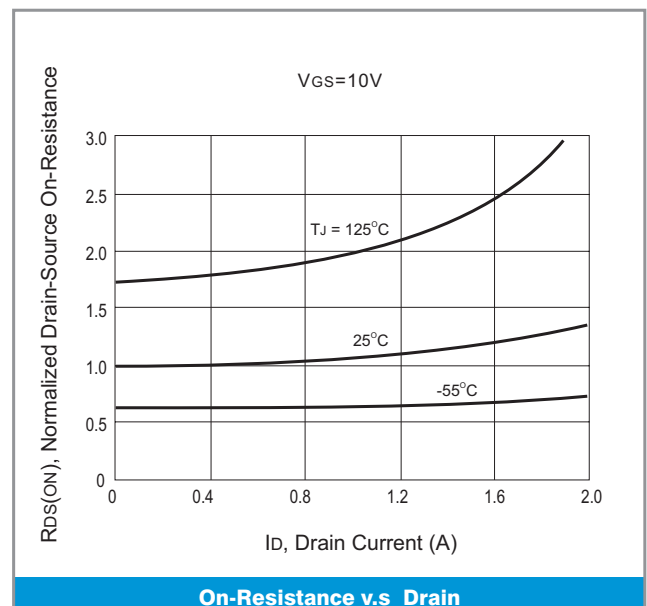
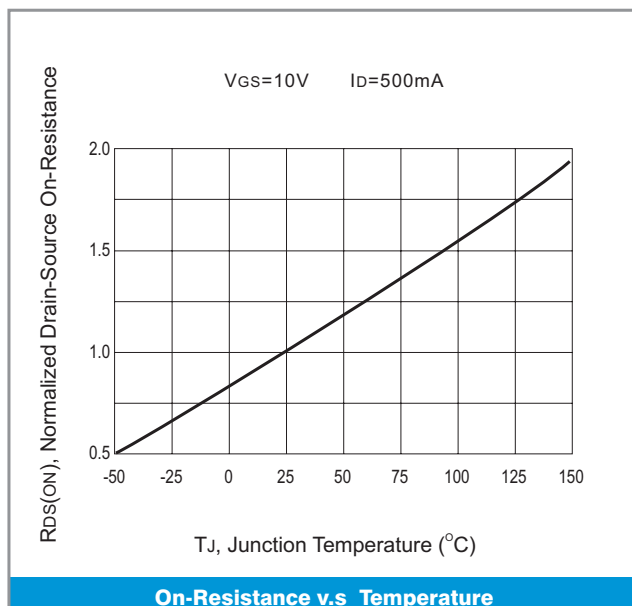
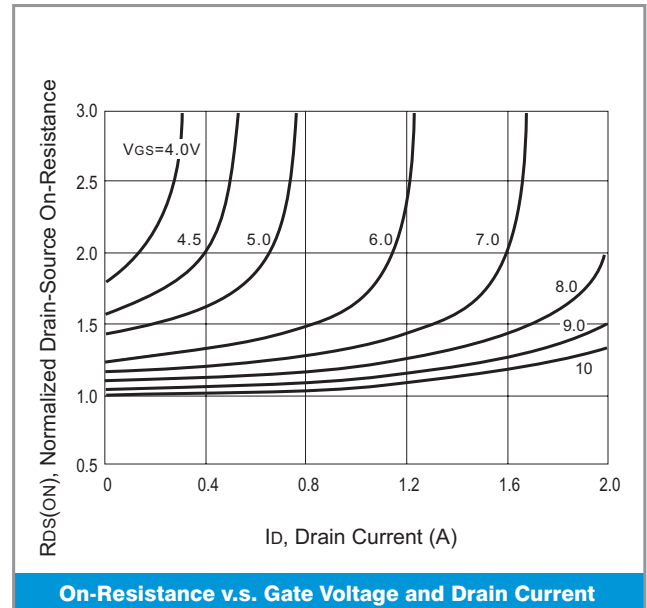
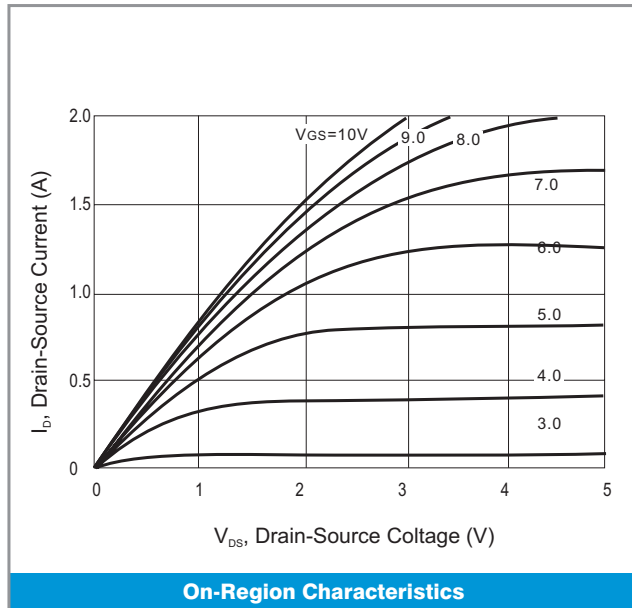
T<sub>A</sub> = 25°C Unless otherwise noted.

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	V <sub>GS</sub> =0V, I <sub>b</sub> =10μA	60	-	-	V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =25°C V <sub>DS</sub> =60V, V <sub>GS</sub> =0V, T <sub>J</sub> =125°C	- -	- -	1.0 0.5	μA mA
Gate - Body Leakage, Forward	I <sub>GSSF</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> =20V	-	-	100	nA
Gate - Body Leakage, Reverse	I <sub>GSSR</sub>	V <sub>DS</sub> =0V, V <sub>GS</sub> = -20V	-	-	-100	nA
<b>ON CHARACTERISTICS (note1)</b>						
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>b</sub> =250μA	1	2.1	2.5	V
Static Drain-Source On-Resistance	R <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>b</sub> =500mA, T <sub>J</sub> =100°C	-	1.2	7.5	Ω
Drain-Source On-Voltage	V <sub>DS(on)</sub>	V <sub>GS</sub> =10V, I <sub>b</sub> =500mA V <sub>GS</sub> =5.0V, I <sub>b</sub> =50mA	- -	0.60 0.09	3.75 1.50	V
On-State Drain Current	I <sub>D(on)</sub>	V <sub>GS</sub> =10V, V <sub>DS</sub> ≥ 2V <sub>DS(on)</sub>	500	2700	-	mA
Forward Transconductance	G <sub>FS</sub>	V <sub>DS</sub> ≥ 2V <sub>DS(on)</sub> , I <sub>b</sub> =200mA	80	320	-	mS
<b>DYNAMIC CHARACTERISTICS</b>						
Input Capacitance	C <sub>ISS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1.0 MHz	-	20	50	pF
Output Capacitance	C <sub>OSS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1.0 MHz	-	11	25	pF
Reverse Transfer Capacitance	C <sub>RSS</sub>	V <sub>DS</sub> =25V, V <sub>GS</sub> =0V, F=1.0 MHz	-	4	5	pF
Turn-On Time	T <sub>ON</sub>	V <sub>DD</sub> =30V, R <sub>L</sub> =150Ω, I <sub>b</sub> =200 mA V <sub>GS</sub> =10V, R <sub>GEN</sub> =25Ω	-	-	20	ns
Turn-Off Time	T <sub>OFF</sub>	V <sub>DD</sub> =30V, R <sub>L</sub> =150Ω, I <sub>b</sub> =200 mA V <sub>GS</sub> =10V, R <sub>GEN</sub> =25Ω	-	-	20	ns

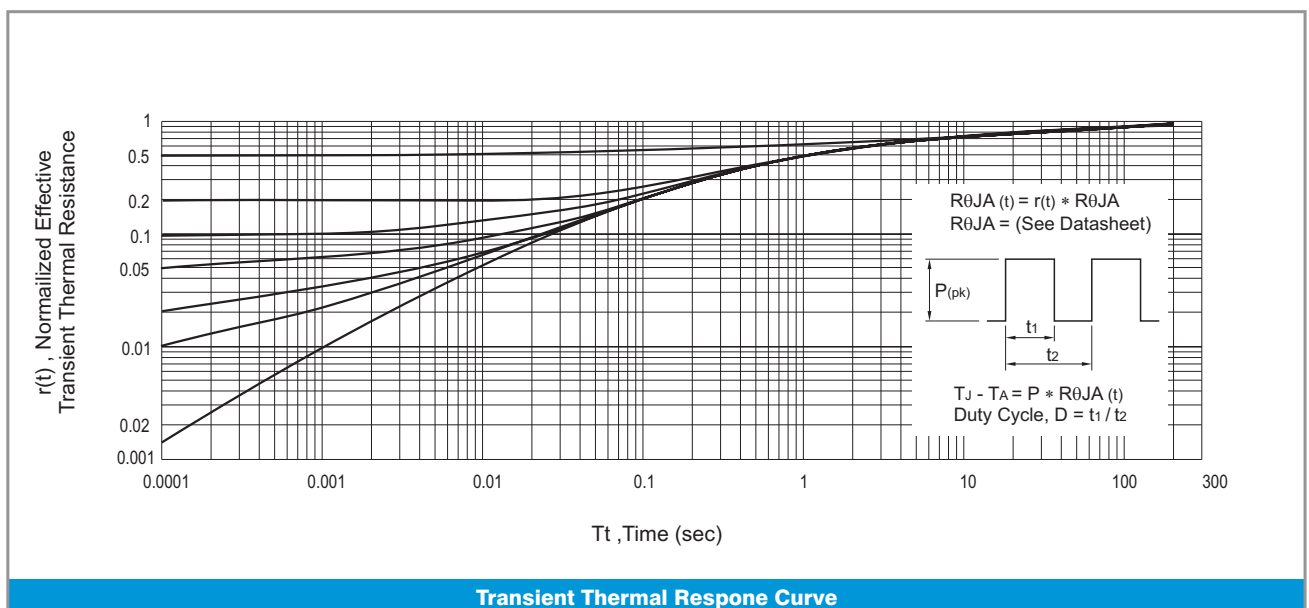
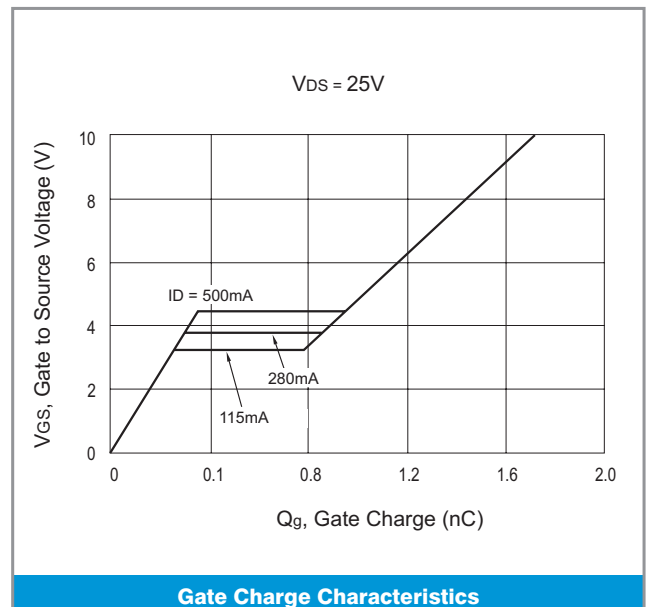
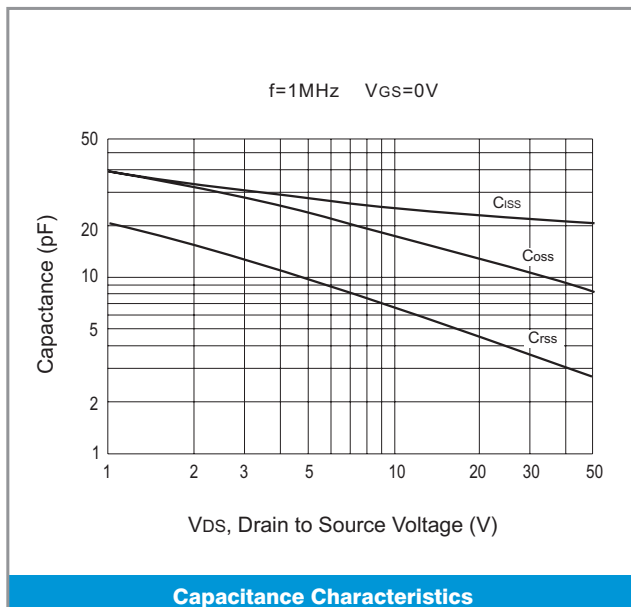
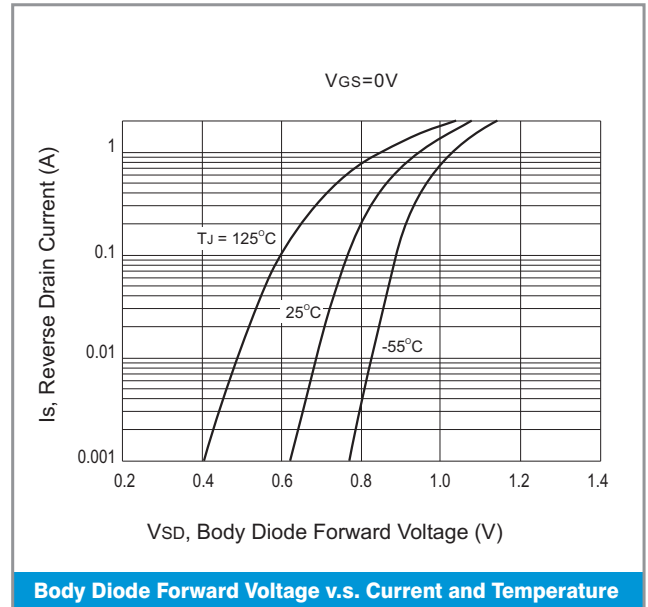
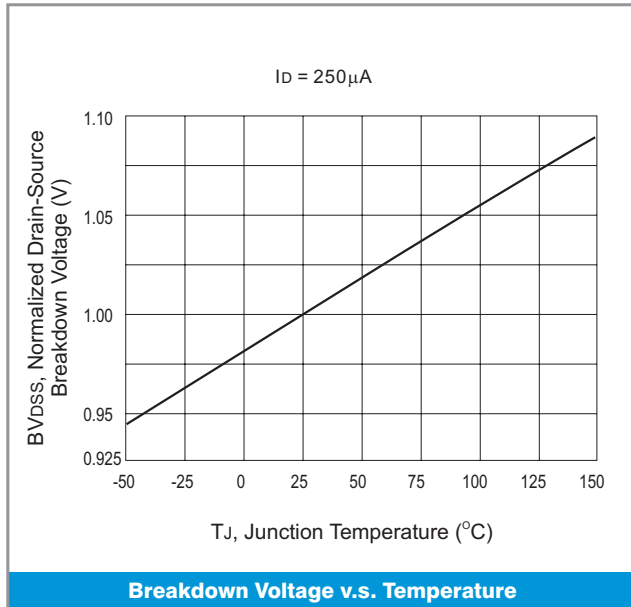
Note:

1.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2.0%

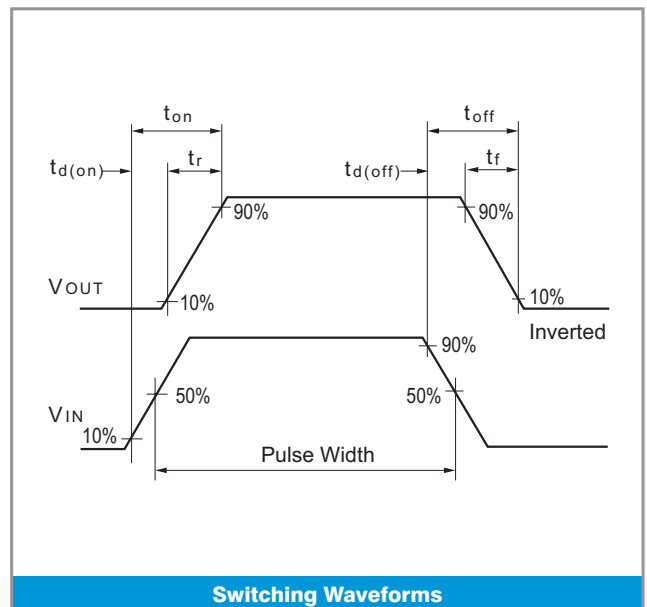
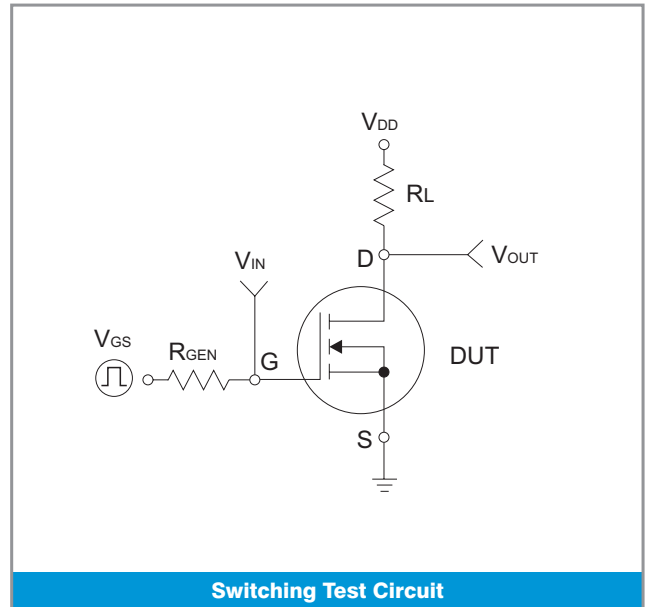
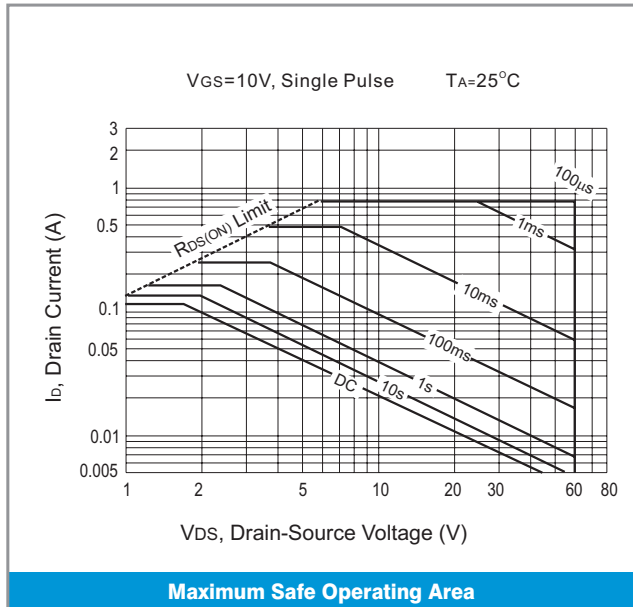
# RATING and CHARACTERISTIC CURVES



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