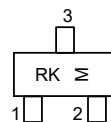


PRIMARY CHARACTERISTICS

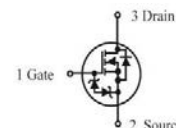
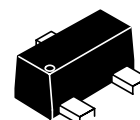
BV _{DSS}	R _{DS(on)} MAX	I _D
60V	2.3Ω@V _{GS} =10V	380mA
	2.7Ω@V _{GS} =5V	

SC-89
PACKAGE
MARKING DIAGRAM


RK = Specific Device Code
M = Month Code

Data Code List

Month	Odd Year	Even Year
Jan	1	E
Feb	2	F
Mar	3	H
Apr	4	J
May	5	K
Jun	6	L
Jul	7	N
Aug	8	P
Sep	9	U
Oct	T	X
Nov	V	Y
Dec	C	Z


GENERAL DESCRIPTION

- We declare that the material of product compliance with RoHS requirements and Halogen Free.
- ESD Protected

MECHANICAL DATA

- Case : Molded plastic, SC-89
- Polarity : Shown above
- Terminals : Plated terminals, solderable per MIL-STD-750, Method 2026
- Epoxy : UL94-V0 rated flame retardant

MAXIMUM RATINGS(Ta = 25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	VDSS	60	V
Gate-Source Voltage	VGS	±20	V
Drain Current	ID		mA
– Steady State TA = 25°C		320	
TA = 85°C		230	
– t<5s TA = 25°C		380	
TA = 85°C		270	
Pulsed Drain Current (tp=10μs)	IDM	1.5	A
Source Current (Body Diode)	IS	300	mA

THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation(Note 1)	PD		mW
– Steady State		300	
– t<5s		420	
Junction-to-Ambient(Note 1)	RθJA		°C/W
– Steady State		417	
– t<5s		300	
Lead Temperature for Soldering Purposes (1/8 " from case for 10 s)	TL	260	°C
Junction and Storage temperature	TJ, Tstg	–55~+150	°C
Gate-Source ESD Rating(HBM, Method 3015)	ESD	2000	V

1. FR-5 = 1.0×0.75×0.062 in.

ELECTRICAL CHARACTERISTICS (Ta= 25°C)
OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain–Source Breakdown Voltage (VGS = 0, ID = 250μA)	VBRDSS	60	-	-	V
Drain-to–Source Breakdown Voltage Temperature Coefficient	VBRDSS/TJ	-	71	-	mV/°C
Zero Gate Voltage Drain Current (VGS = 0, VDS = 60 V)	IDSS	-	-	1.0	μA
(VGS = 0, VDS = 50 V)		-	-	500	nA
Gate–Body Leakage Current, Forward (VGS = 20 V)	IGSSF	-	-	10	μA
Gate–Body Leakage Current, Reverse (VGS = - 20 V)	IGSSR	-	-	-10	μA

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage (VDS = VGS, ID = 250μA)	VGS(th)	1.0	1.5	2	V
Negative Threshold Temperature Coefficient	VGS(TH)/TJ	-	4	-	mV/°C
Static Drain–Source On–State Resistance (VGS = 10 V, ID = 500 mA)	RDS(on)	-	-	2.3	Ohm
(VGS = 5.0 V, ID = 50 mA)		-	-	2.7	
Forward Transconductance (VDS = 5.0 V, ID = 200 mA)	gfs	80	-	-	mS

DYNAMIC CHARACTERISTICS

Total Gate Charge (VDS = 10V, VGS = 4.5V, ID = 0.5A)	Qg	-	360	-	pC
Gate–Source Charge (VDS = 10V, VGS = 4.5V, ID = 0.5A)	Qgs	-	90	-	
Gate–Drain Charge (VDS = 10V, VGS = 4.5V, ID = 0.5A)	Qgd	-	210	-	
Input Capacitance (VDS = 25 V, VGS = 0, f = 1.0 MHz)	Ciss	-	34	-	pF
Output Capacitance (VDS = 25 V, VGS = 0, f = 1.0 MHz)	Coss	-	3	-	pF
Reverse Transfer Capacitance (VDS = 25 V, VGS = 0, f = 1.0 MHz)	Crss	-	2.2	-	pF

SWITCHING CHARACTERISTICS

Turn-On Delay Time	VDS = 10 V, VGEN = 10 V, ID = 500 mA	td(on)	-	3.8	-	ns
Rise Time		tr	-	3.4	-	
Turn-Off Delay Time		td(off)	-	19	-	
Fall Time		tf	-	12	-	

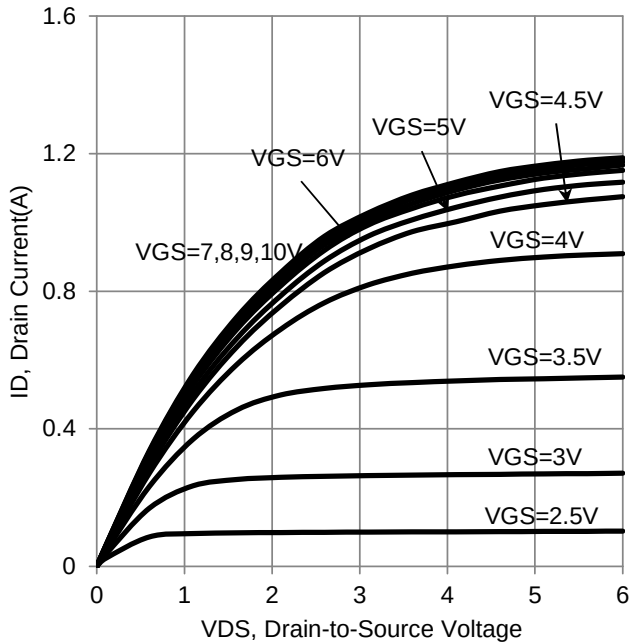
BODY–DRAIN DIODE RATINGS

Diode Forward On–Voltage (IS = 115 mA, VGS = 0 V)	VSD	-	-	1.4	V
		-	0.7	-	

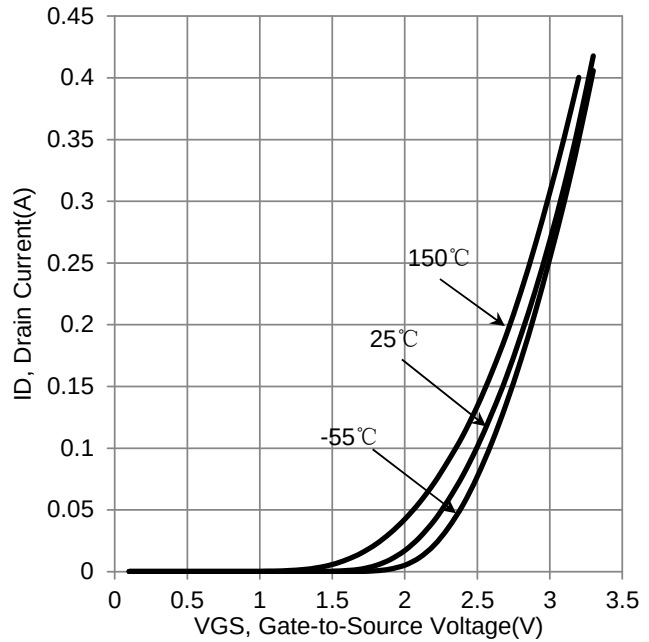
2.Pulse Test: Pulse Width ≤300 μs, Duty Cycle ≤2.0%.



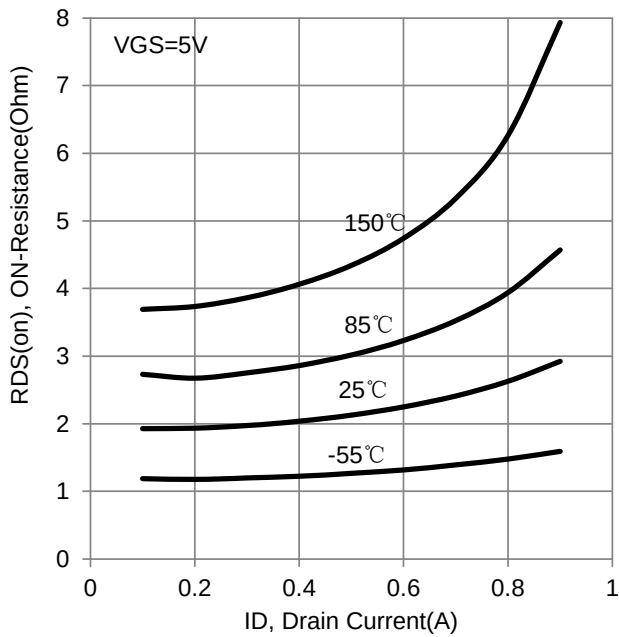
ELECTRICAL CHARACTERISTICS CURVES



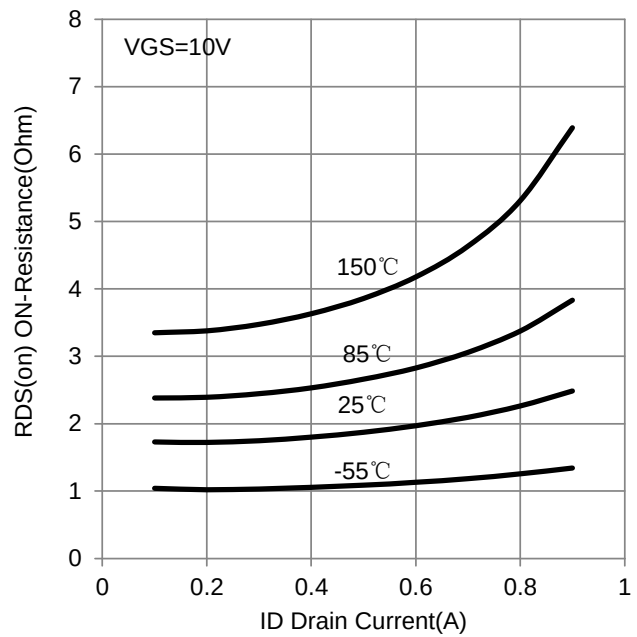
On-Region Characteristics



Transfer Characteristics



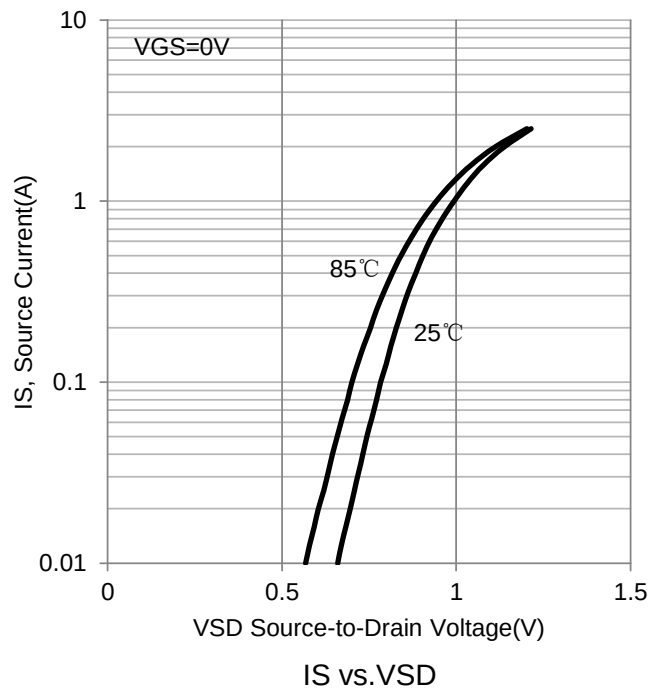
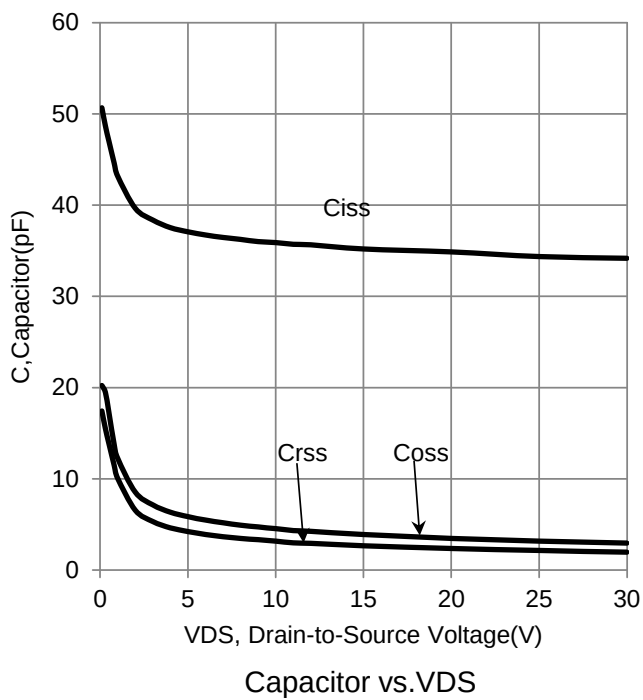
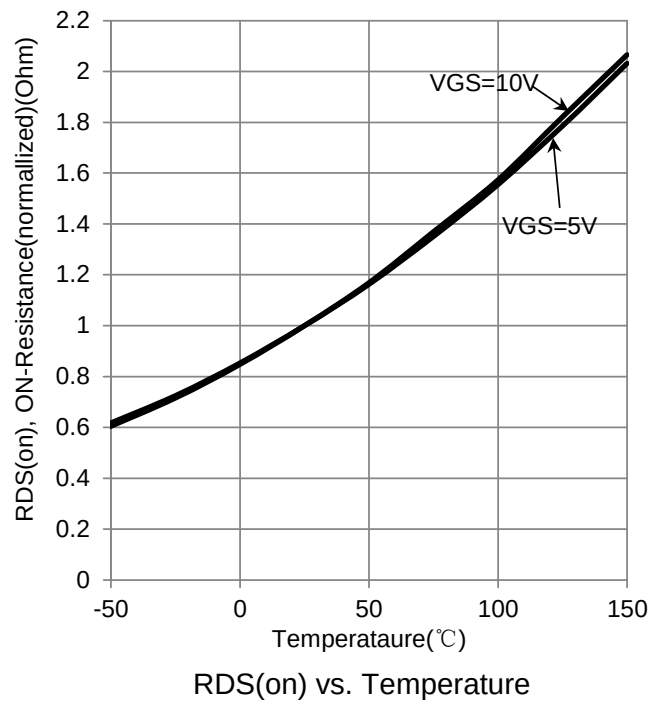
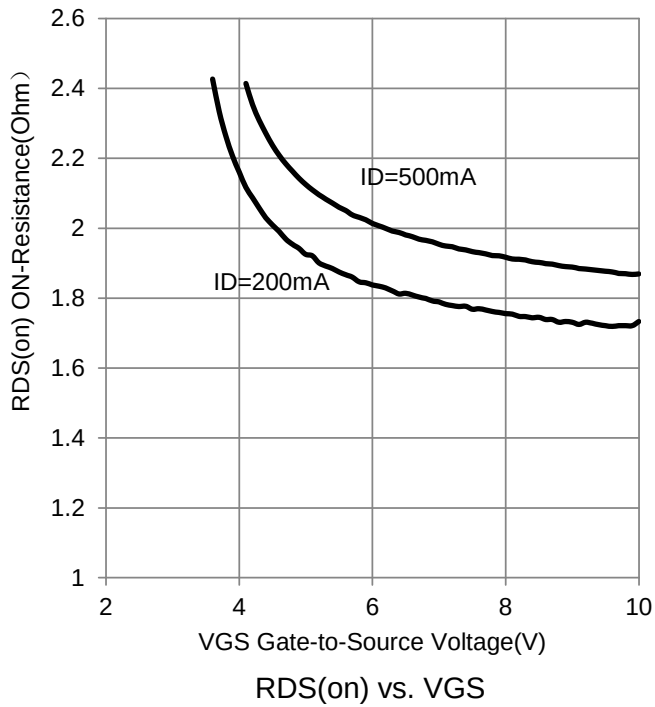
$R_{DS(on)}$ vs. I_D



$R_{DS(on)}$ vs. I_D

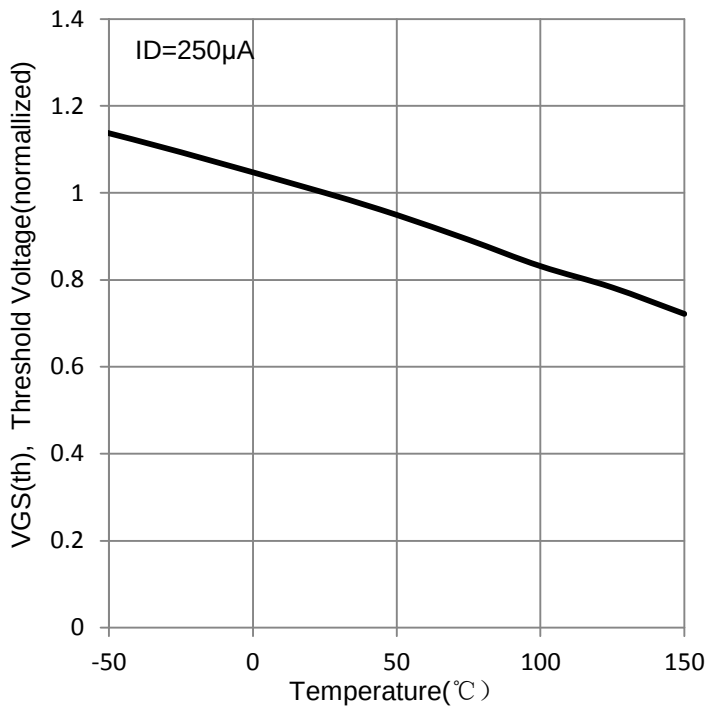


ELECTRICAL CHARACTERISTICS CURVES (Con.)

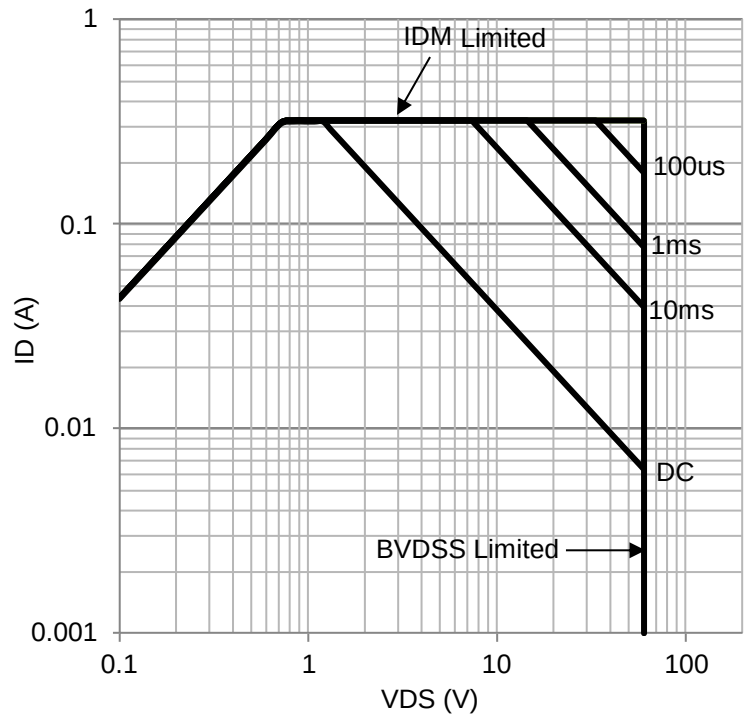




ELECTRICAL CHARACTERISTICS CURVES (Con.)



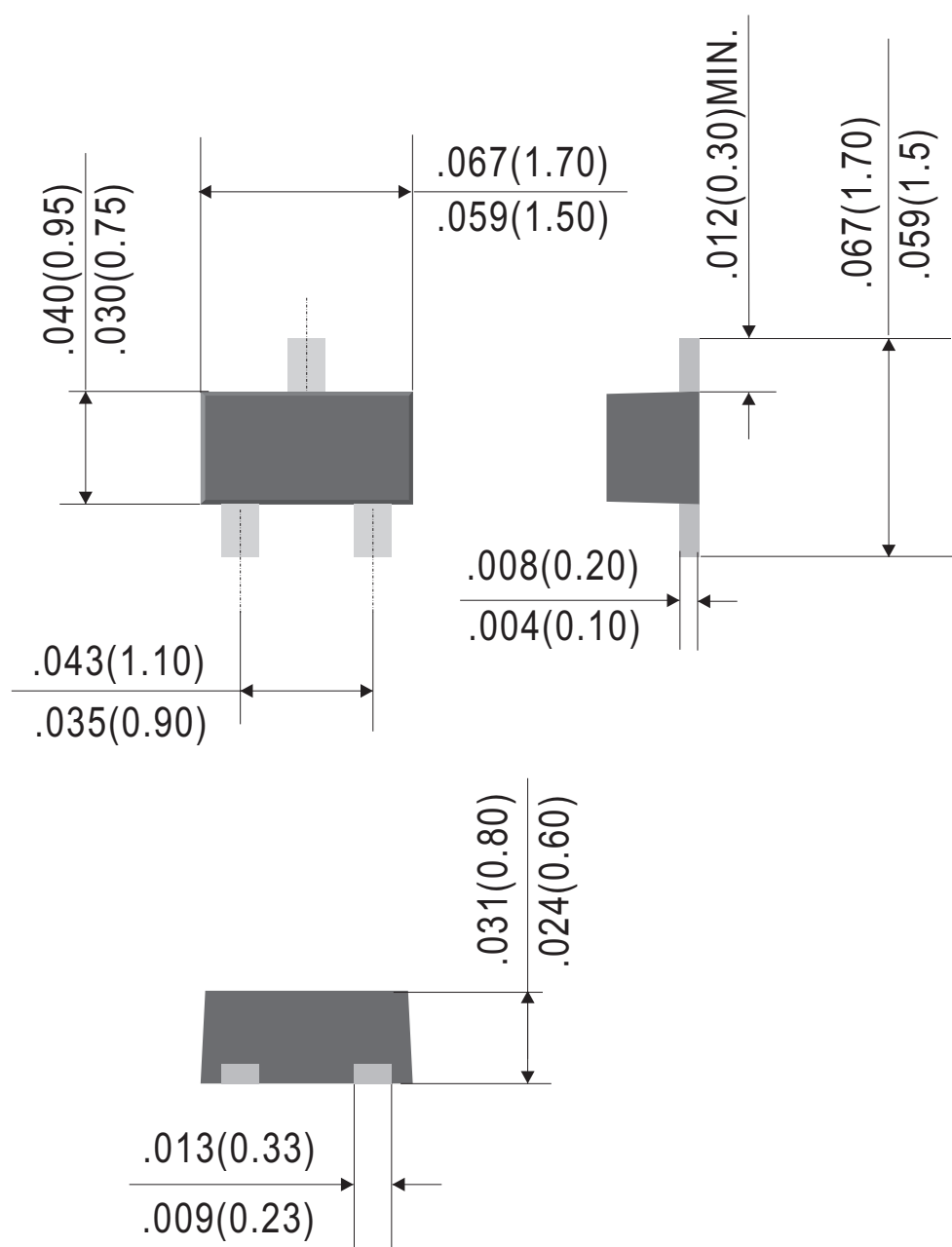
$V_{GS(th)}$ vs. Temperature



Safe Operating Area

Outline Drawing

SC-89



Dimensions in inches and (millimeters)

Rev.D

Ordering Information:

Device PN	Packing
2N7002KT -T ⁽¹⁾ H ⁽²⁾ -WS ⁽³⁾	Tape&Reel: 3 Kpcs/Reel

Note: (1) Packing code, Tape & Reel Packing

(2) Halogen free product for packing code suffix "H"

(3) WS : Willas brand abbreviation, Label Type does not display

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