

N-CHANNEL MOSFET

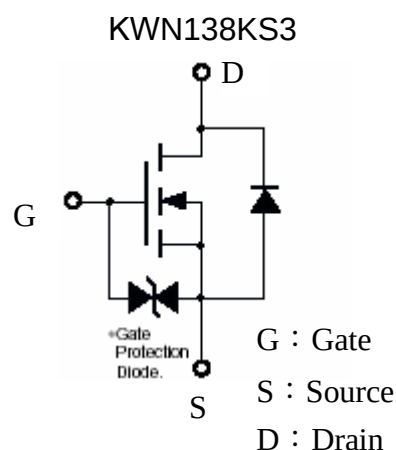
Description:

The KWN138KS3 is a N-channel enhancement-mode MOSFET.

Features:

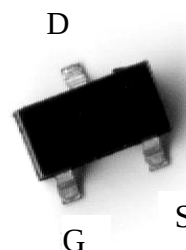
- Low on-resistance
- High ESD
- High speed switching
- Low-voltage drive
- Easily designed drive circuits
- Easy to use in parallel
- Pb-free package

Symbol



Outline

SOT-323



Ordering Information

Device	Package	Shipping
KWN138KS3	SOT-323 (Pb-free lead plating and halogen-free package)	3000 pcs / Tape & Reel

Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-Source Voltage		V _{DSS}	60	V
Gate-Source Voltage		V _{GSS}	±20	V
Drain Current	Continuous	I _D	220	mA
	Pulsed	I _{DP}	800 *1	
Drain Reverse Current	Continuous	I _{DR}	220	
	Pulsed	I _{DRP}	800 *1	
Total Power Dissipation		P _D	200 *2	mW
Thermal Resistance, Junction to Ambient		R _{θJA}	625 *2	°C/W
ESD susceptibility			1500 *3	V
Operating Channel Temperature Range		T _{CH}	-55~+150	°C
Storage Temperature Range		T _{stg}	-55~+150	

Note : *1. Pulse Width ≤ 300μs, Duty cycle ≤ 2%

*2. When the device is mounted on a minimum pad size

*3. Human body model, 1.5kΩ in series with 100pF

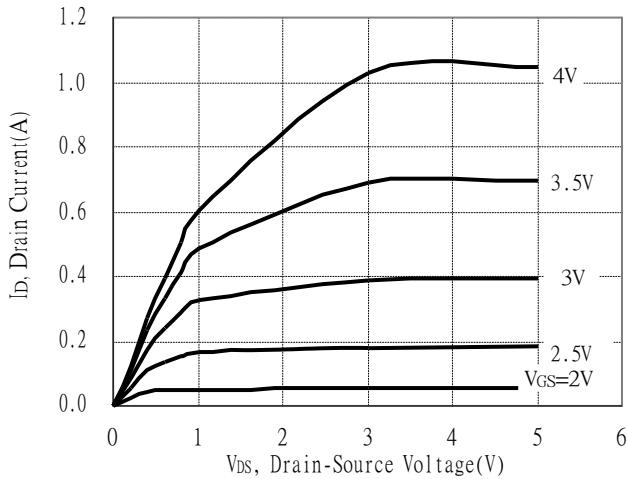
Electrical Characteristics (Ta=25°C)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV _{DSS} *	60	-	-	V	V _{GS} =0, I _D =10μA
V _{GS(th)}	0.5	1.2	1.5		V _{DS} =V _{GS} , I _D =250μA
I _{GSS}	-	-	±10	μA	V _{GS} =±20V, V _{DS} =0
I _{DSS}	-	-	1		V _{DS} =60V, V _{GS} =0
R _{DS(ON)} *	-	1.2	3	Ω	I _D =220mA, V _{GS} =10V
	-	1.4	3.2		I _D =220mA, V _{GS} =4.5V
G _{FS}	200	360	-	mS	V _{DS} =10V, I _D =220mA
Dynamic					
C _{iss}	-	29	-	pF	V _{DS} =25V, V _{GS} =0, f=1MHz
C _{oss}	-	4	-		
C _{rss}	-	2.8	-		
t _{d(ON)}	-	3	-	ns	V _{DS} =30V, I _D =200mA, V _{GS} =10V, R _G =6Ω
t _r	-	5	-		
t _{d(OFF)}	-	14	-		
t _f	-	9	-		
Q _g	-	1.1	-	nC	V _{DS} =30V, I _D =200mA, V _{GS} =10V
Q _{gs}	-	0.1	-		
Q _{gd}	-	0.23	-		
Source-Drain Diode					
*V _{SD}	-	0.8	1.2	V	V _{GS} =0V, I _S =200mA

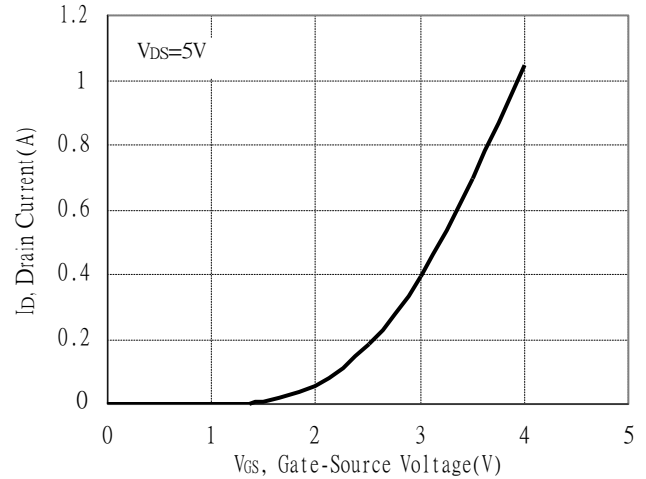
*Pulse Test : Pulse Width ≤ 380μs, Duty Cycle ≤ 2%

Typical Characteristics

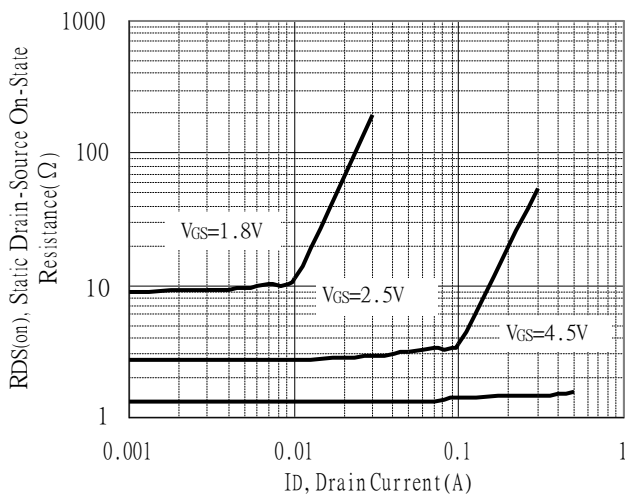
Typical Output Characteristics



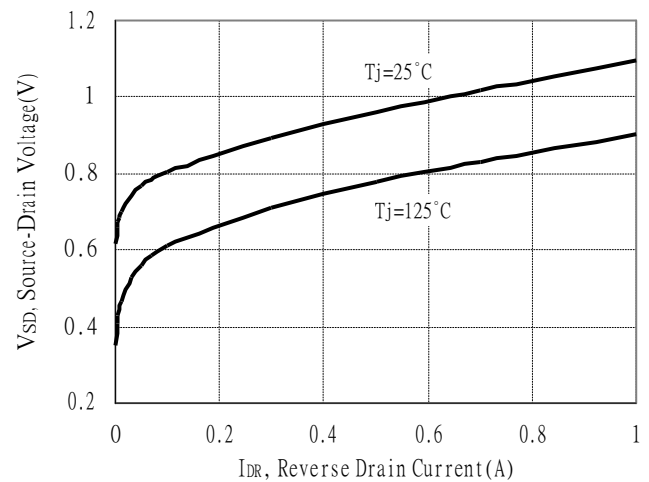
Typical Transfer Characteristics



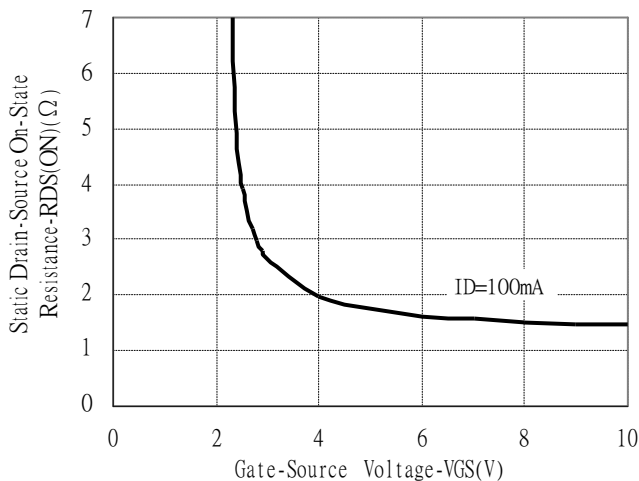
Static Drain-Source On-State resistance vs Drain Current



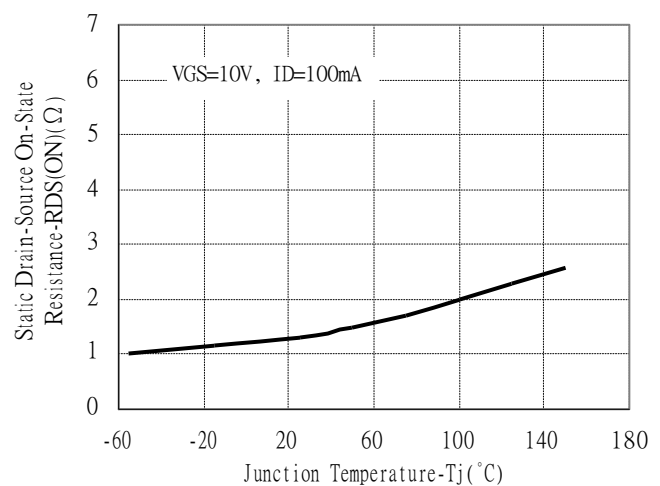
Reverse Drain Current vs Source-Drain Voltage



Static Drain-Source On-State Resistance vs Gate-Source Voltage

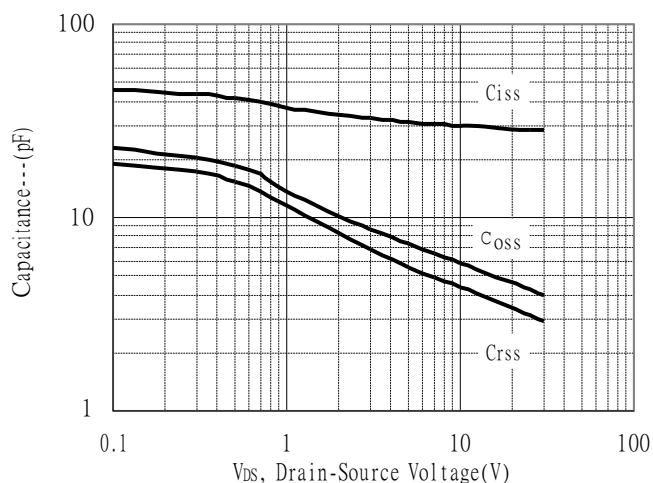


Drain-Source On-State Resistance vs Junction Temperature

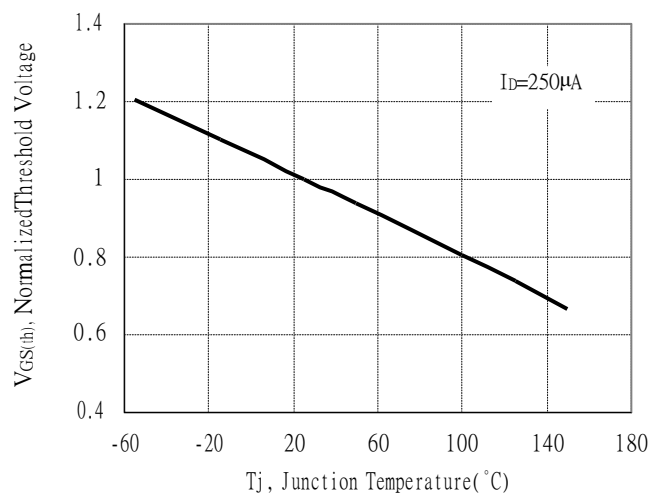


Characteristic Curves(Cont.)

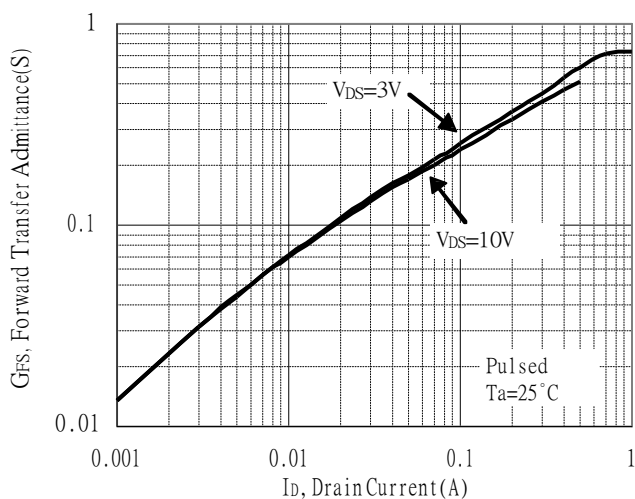
Capacitance vs Drain-to-Source Voltage



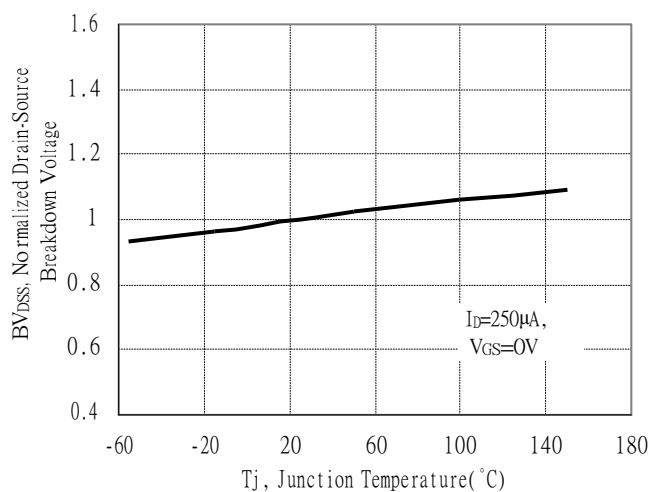
Threshold Voltage vs Junction Temperature



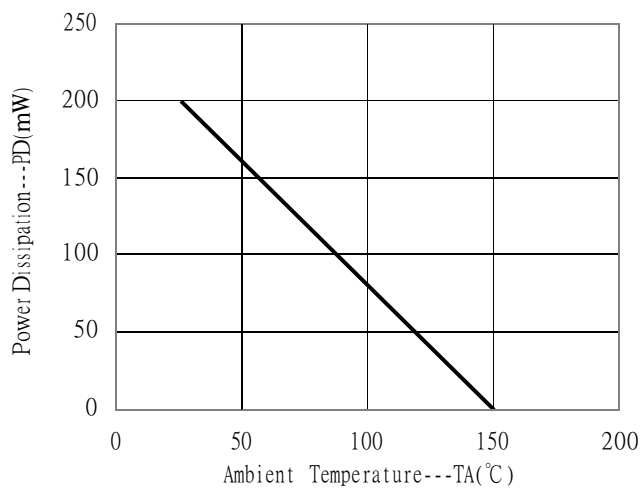
Forward Transfer Admittance vs Drain Current



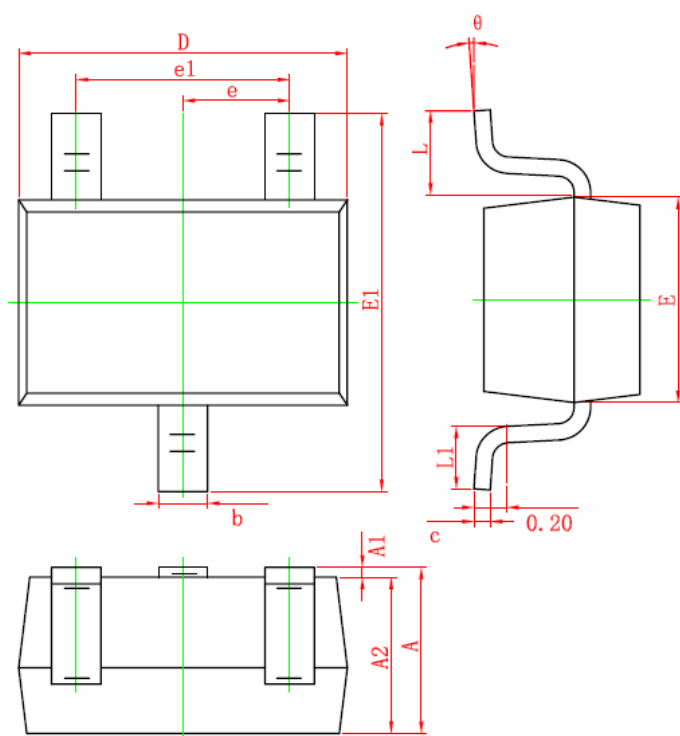
Breakdown Voltage vs Ambient Temperature



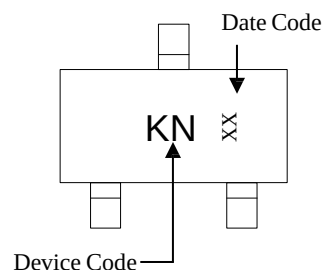
Power Derating Curve



SOT-323 Dimension



Marking:



3-Lead SOT-323 Plastic
 Surface Mounted Package
 Package Code: S3

Style: Pin 1.Gate 2.Source 3.Drain

DIM	Millimeters		Inches		DIM	Millimeters		Inches	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.900	1.100	0.035	0.043	E1	2.150	2.450	0.085	0.096
A1	0.000	0.100	0.000	0.004	e	0.650	TYP	0.026	TYP
A2	0.900	1.000	0.035	0.039	e1	1.200	1.400	0.047	0.055
b	0.200	0.400	0.008	0.016	L	0.525	REF	0.021	REF
c	0.080	0.150	0.003	0.006	L1	0.260	0.460	0.010	0.018
D	2.000	2.200	0.079	0.087	θ	0°	8°	0°	8°
E	1.150	1.350	0.045	0.053					