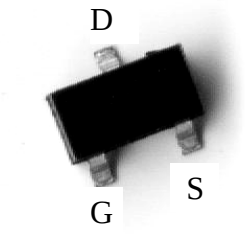
30V N-CHANNEL Enhancement Mode MOSFET

Features:

- Simple drive requirement
- Small package outline
- Pb-free package

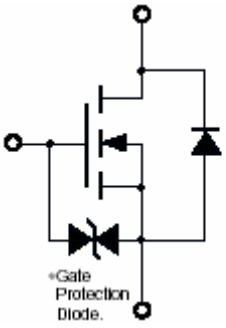
Outline

SOT-23



Symbol

KWN4003N3



G：Gate
S：Source
D：Drain

Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current @ T_A=25°C , V_{GS}=4V	I_D	1.3	A
Continuous Drain Current @ T_A=70°C, V_{GS}=4V		1.0	
Pulsed Drain Current (Notes 1, 2)	I_{DM}	3	
Maximum Power Dissipation@ T_A=25℃	P_D	1.38 (Note 3)	W
Linear Derating Factor		0.01	W/°C
ESD susceptibility		1000 (Note 4)	V
Operating Junction and Storage Temperature	Tj, Tstg	-55~+150	°C

Note : 1. Pulse width limited by maximum junction temperature.
2. Pulse width≤ 300μs, duty cycle≤2%.
3. Surface mounted on 1 in² copper pad of FR-4 board, t≤5s.
4. Human body model, 1.5kΩ in series with 100pF.

Thermal Performance

Parameter	Symbol	Limit	Unit
Thermal Resistance, Junction-to-Ambient(PCB mounted)	Rth,ja	90	°C/W

Note : Surface mounted on 1 in² copper pad of FR-4 board, t≤5s; 270°C/W when mounted on minimum copper pad.

Electrical Characteristics (Tj=25°C, unless otherwise noted)

Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Static					
BV_{DSS}	30	-	-	V	V_{GS}=0, I_D=250μA
$V_{GS(th)}$	1.0	1.3	1.8	V	V_{DS}=V_{GS}, I_D=250μA
I_{GSS}	-	-	±10	μA	V_{GS}=±20V, V_{DS}=0
I_{DSS}	-	-	1	μA	V_{DS}=30V, V_{GS}=0
	-	-	10	μA	V_{DS}=24V, V_{GS}=0 (Tj=70°C)
*$R_{DS(ON)}$	-	305	450	mΩ	V_{GS}=10V, I_D=500mA
	-	450	600	mΩ	V_{GS}=4V, I_D=100mA
	-	810	1000	mΩ	V_{GS}=2.5V, I_D=100mA
*G_{FS}	-	435	-	mS	V_{DS}=10V, I_D=100mA
Dynamic					
Ciss	-	43	-	pF	V_{DS}=5V, V_{GS}=0, f=1MHz
Coss	-	13	-	pF	
Crss	-	8	-	pF	
$t_{d(ON)}$	-	22	-	ns	V_{DS}=5V, I_D=100mA, V_{GS}=4.5V, R_G=50Ω
t_r	-	26	-	ns	
$t_{d(OFF)}$	-	72	-	ns	
t_f	-	55	-	ns	
Qg	-	1.34	-	nC	V_{DS}=24V, I_D=100mA, V_{GS}=5V
Qgs	-	0.1	-	nC	
Qgd	-	0.57	-	nC	
Source-Drain Diode					
*V_{SD}	-	0.74	1.2	V	V_{GS}=0V, I_S=100mA

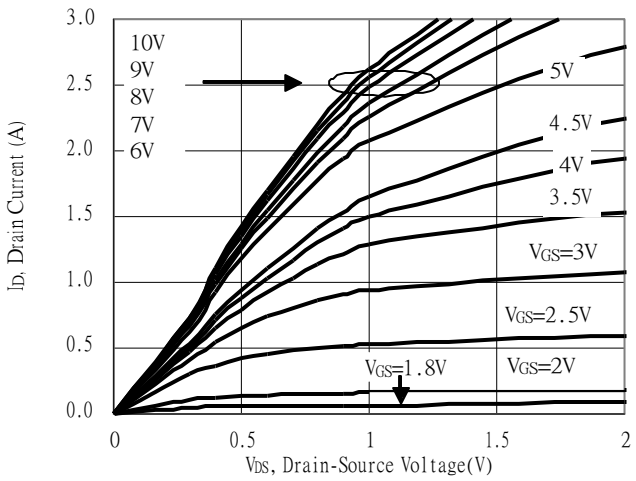
*Pulse Test : Pulse Width ≤300μs, Duty Cycle≤2%

Ordering Information

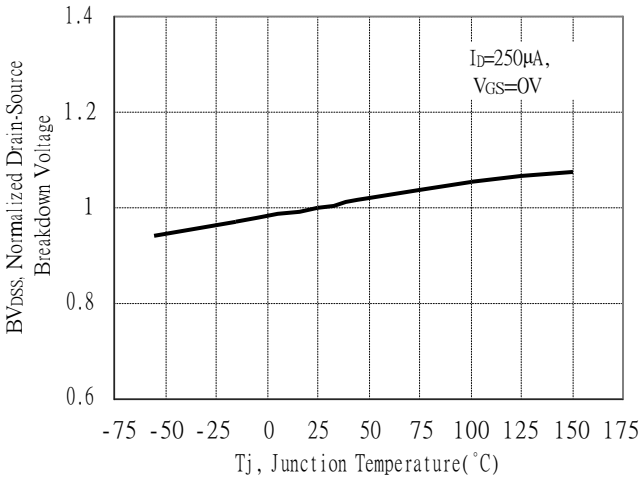
Device	Package	Shipping	Marking
KWN4003N3	SOT-23 (Pb-free)	3000 pcs / Tape & Reel	4003

Typical Characteristics

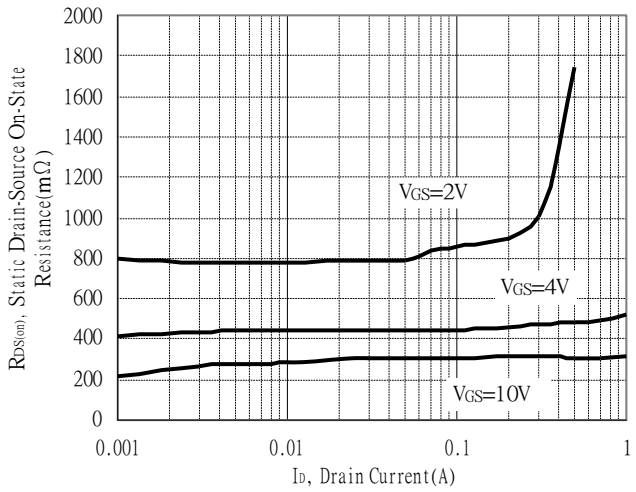
Typical Output Characteristics



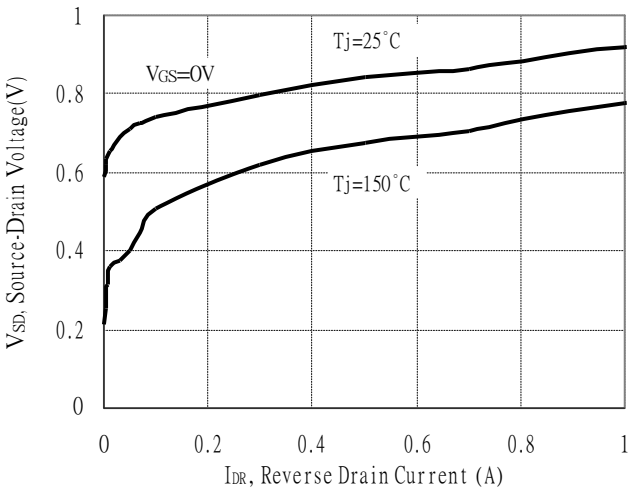
Brekdown Voltage vs Ambient Temperature



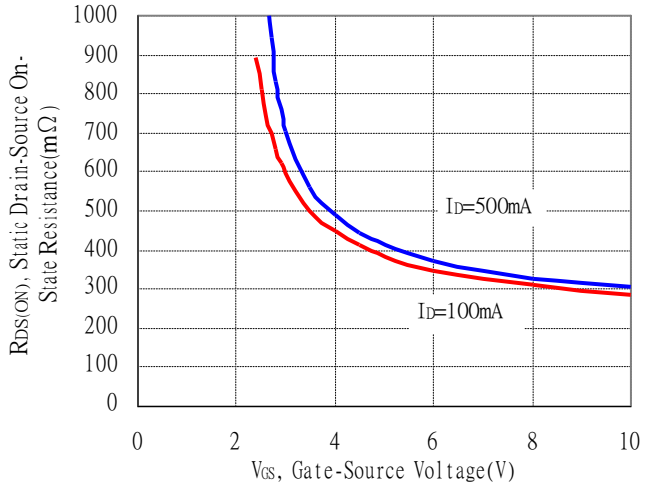
Static Drain-Source On-State resistance vs Drain Current



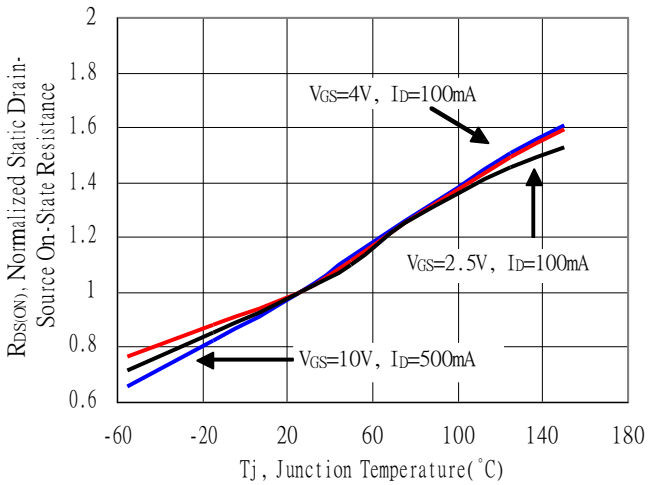
Reverse Drain Current vs Source-Drain Voltage



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

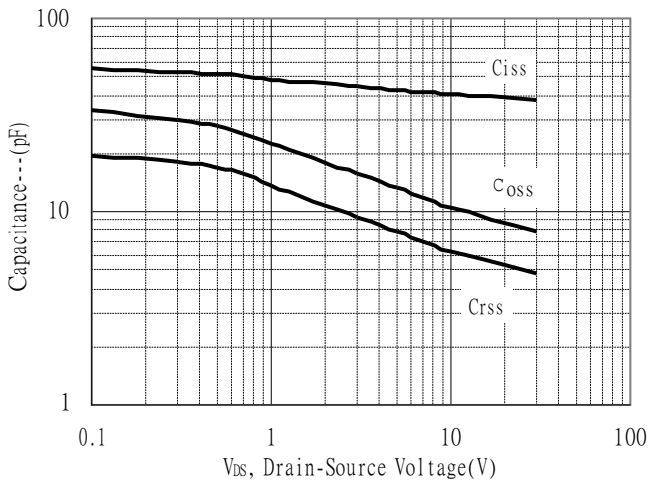


Drain-Source On-State Resistance vs Junction Tempearture

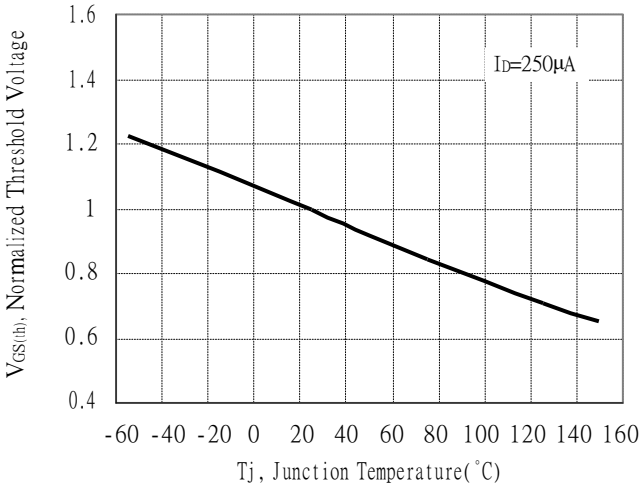


Typical Characteristics(Cont.)

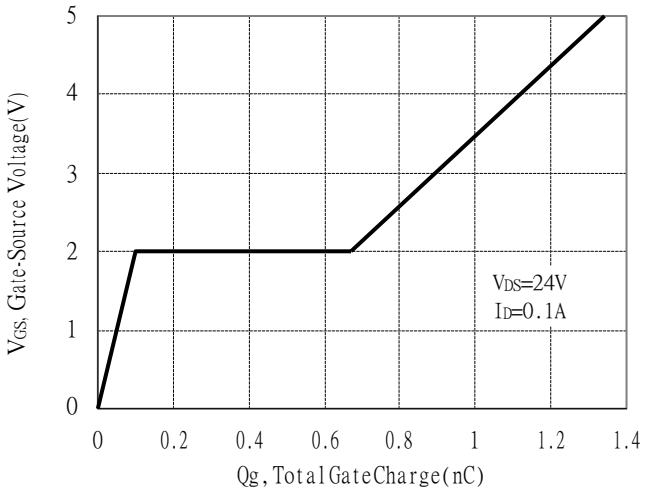
Capacitance vs Drain-to-Source Voltage



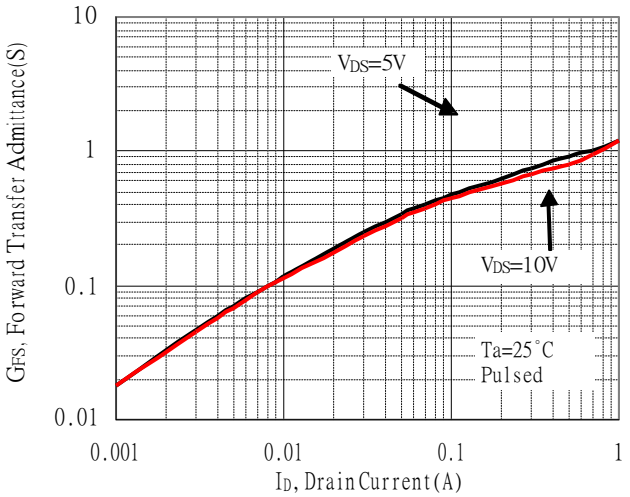
Threshold Voltage vs Junction Tempearture



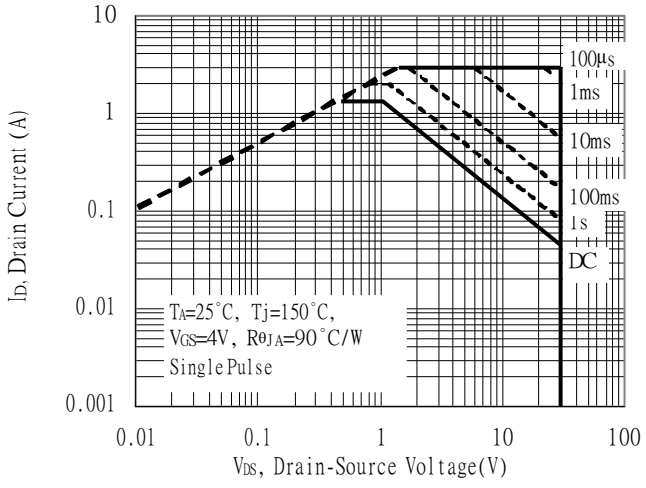
Gate Charge Characteristics



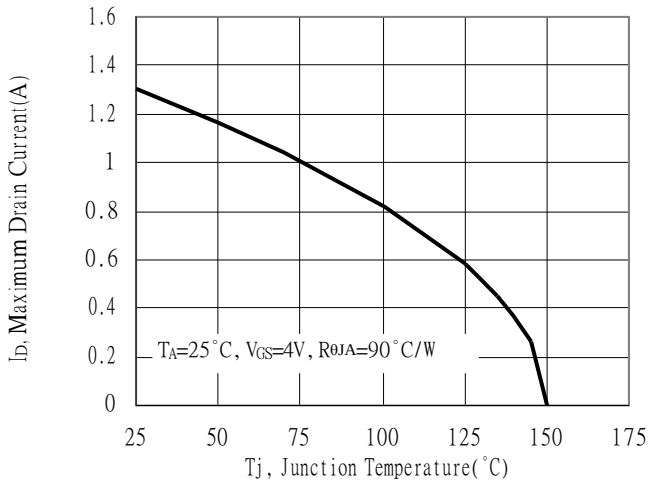
Forward Transfer Admittance vs Drain Current



Maximum Safe Operating Area

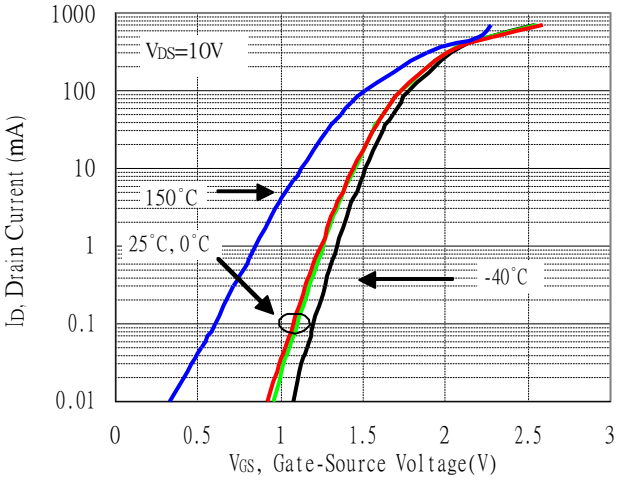


Maximum Drain Current vs JunctionTemperature

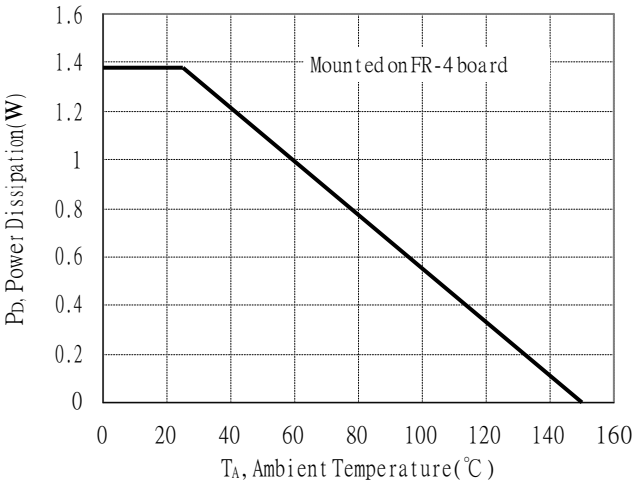


Typical Characteristics(Cont.)

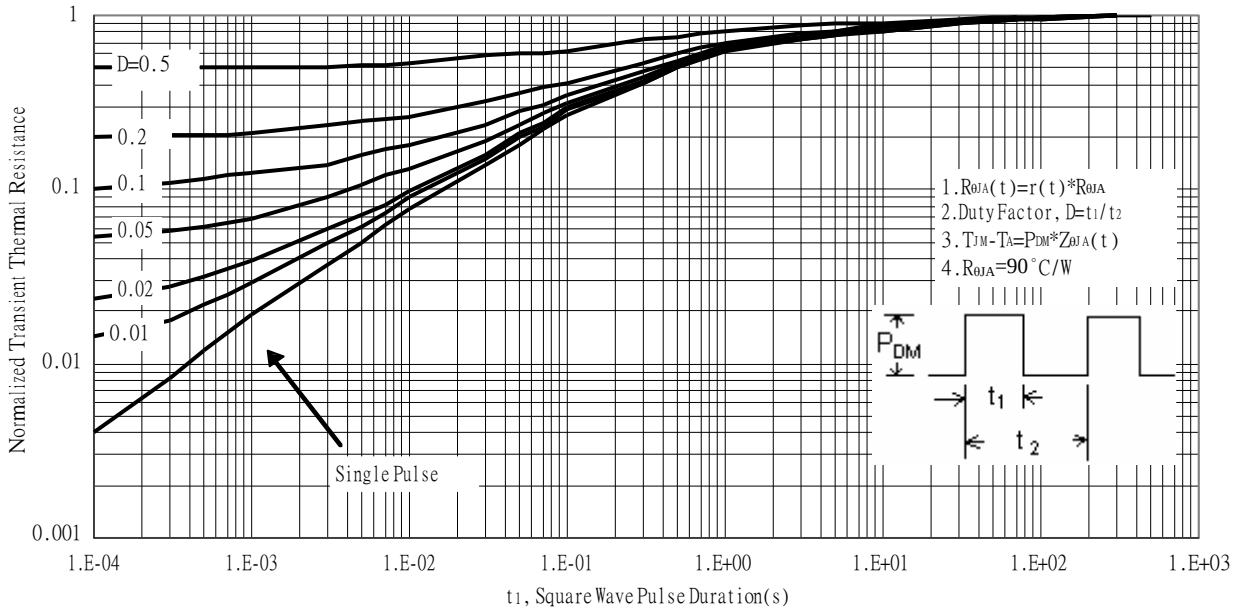
Typical Transfer Characteristics



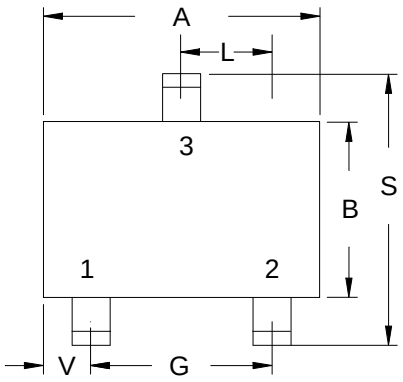
Power Derating Curve

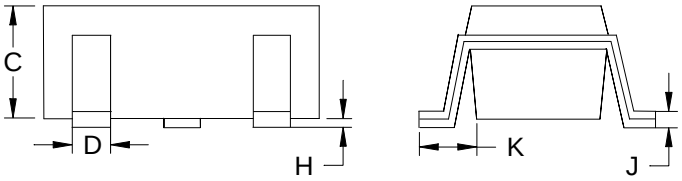


Transient Thermal Response Curves

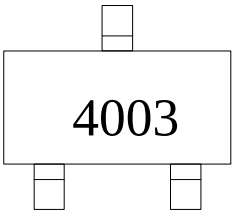


SOT-23 Dimension





Marking:



3-Lead SOT-23 Plastic
Surface Mounted Package
Code: N3

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

*: Typical

DIM	Inches		Millimeters		DIM	Inches		Millimeters	
	Min.	Max.	Min.	Max.		Min.	Max.	Min.	Max.
A	0.1102	0.1204	2.80	3.04	J	0.0032	0.0079	0.08	0.20
B	0.0472	0.0669	1.20	1.70	K	0.0118	0.0266	0.30	0.67
C	0.0335	0.0512	0.89	1.30	L	0.0335	0.0453	0.85	1.15
D	0.0118	0.0197	0.30	0.50	S	0.0830	0.1161	2.10	2.95
G	0.0669	0.0910	1.70	2.30	V	0.0098	0.0256	0.25	0.65
H	0.0000	0.0040	0.00	0.10					