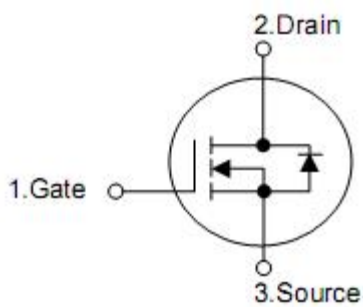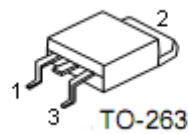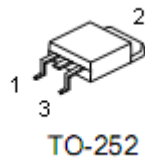# 1. Features

- n RDS(ON)= 7mΩ typ@ VGS=10V
- n Lead free and Green Device Available
- n Low Rds-on to Minimize Conductive Loss
- n High avalanche Current

2. Application

- n Power Supply
- n DC-DC Converters

3. Pin configuration

TO-252   TO-263

Pin	Function
1	Gate
2	Drain
3	Source

4. Ordering Information

Part Number	Package	Brand
KND3306B	TO-252	KIA
KNB3306B	TO-263	KIA

5. Absolute maximum ratings

$(T_C= 25^oC$, unless otherwise specified)

Parameter		Symbol	Rating		Units
			TO-252	TO-263	
Drain-source voltage		V_{DSS}	60		V
Gate-source voltage		V_{GSS}	±25		V
Continuous Drain Current	T_C=25 ^oC	$I_D{}^3$	80*	80	A
	T_C=100 ^oC		60*	60	
Pulsed Drain Current	T_C=25 ^oC	$I_{DP}{}^4$	280		
Avalanche Current		$I_{AS}{}^5$	20		
Avalanche Energy		$E_{AS}{}^5$	400		mJ
Maximum Power Dissipation	T_C=25 ^oC	P_D	84.5	156	W
	T_C =100 ^oC		41	80	
Junction & Storage Temperature Range		T_L, T_{STG}	-55~+150		^oC

*Drain current limited by maximum junction temperature.

6. Thermal characteristics

Symbol	Parameter	Typical		Unit
		TO-252	TO-263	
$R_{θJC}$	Thermal Resistance, Junction-to-Case	1.48	0.8	^oC /W
$R_{θJA}$	Thermal Resistance, Junction-to-Ambient	62.5		

7. Electrical characteristics

(T_J=25°C,unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS}=0V,I_D=250µA	60	-	-	V
Zero gate voltage drain current	I_{DSS}	V_{DS}=48V,V_{GS}=0V T_J=125 ºC			1	µA
					100	µA
Gate-body leakage current	I_{GSS}	V_{GS}=±25V,V_{DS}=0V			±100	nA
Gate threshold voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250µA	2	3	4	V
Drain-source on resistance	$R_{DS(on)}$	V_{GS}=10V,I_D=40A（TO-263)		7	8.0	mΩ
		V_{GS}=10V,I_D=40A（TO-252)		7.5	8.5	mΩ
Diode Characteristics						
Diode Forward Voltage	V_{SD}[1]	V_{GS}=0V,I_{SD}=20A		0.85	1.3	V
Diode Continuous Forwardcurrent	I_S[3]				80	A
Reverse recovery time	t_{rr}	I_F=30A, di/dt=100A/µs		33		ns
Reverse recovery charge	Q_{rr}			61		nC
Dynamic Characteristics[2]						
Gate Repacitance	R_G	V_{GS}=0V, V_{DS}=0A Frequency=1MHz		1.2		Ω
Input capacitance	C_{iss}	V_{DS}=25V,V_{GS}=0V,f=1MHz		3080		pF
Output capacitance	C_{oss}			400		
Reverse transfer capacitance	C_{rss}			195		
Turn-on delay time	$t_{d(on)}$	V_{DD}=30V,I_D=30A, R_G=6.8Ω,V_{GS}=10V		14		ns
Rise time	t_r			13		
Turn-off delay time	$t_{d(off)}$			20		
Fall time	t_f			7.5		
Gate Charge Characteristics[2]						
Total gate charge	Q_g	V_{DS}=30V, I_D=30A ,V_{GS}=10V,		104		nC
Gate-source charge	Q_{gs}			16		
Gate-drain charge	Q_{gd}			22		

Note:
1: Pulse test; pulse width ≦ 300us, duty cycle ≦ 2%.
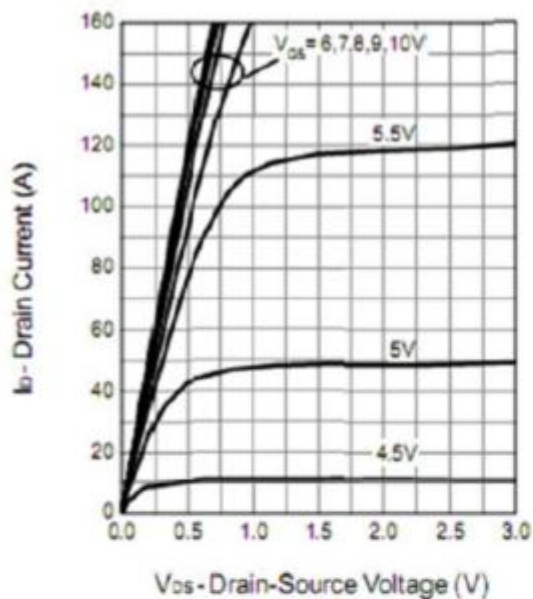2: Guaranteed by design, not subject to production testing.
3: Calculated continuous current based on maximum allowable junction temperature. Package limitation current is 55A.
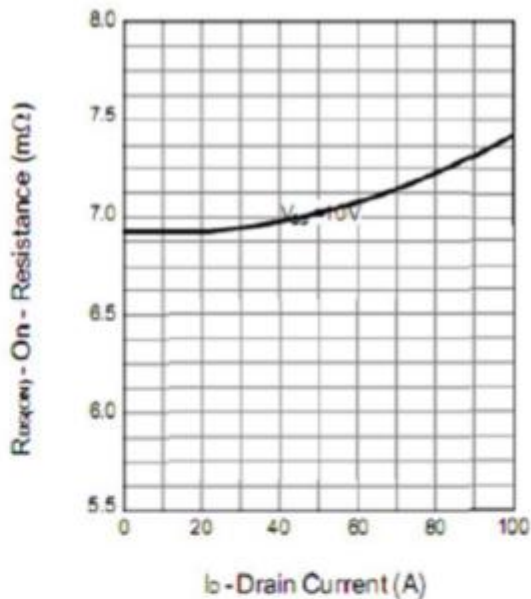4: Repetitive rating, pulse width limited by max junction temperature.
5: Starting T_J=25 ºC,L=0.5mH, IAS=40A.

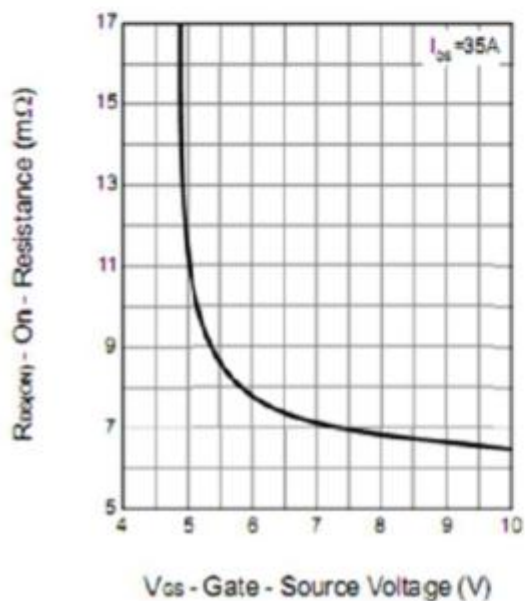## 7. Typical Characteristics

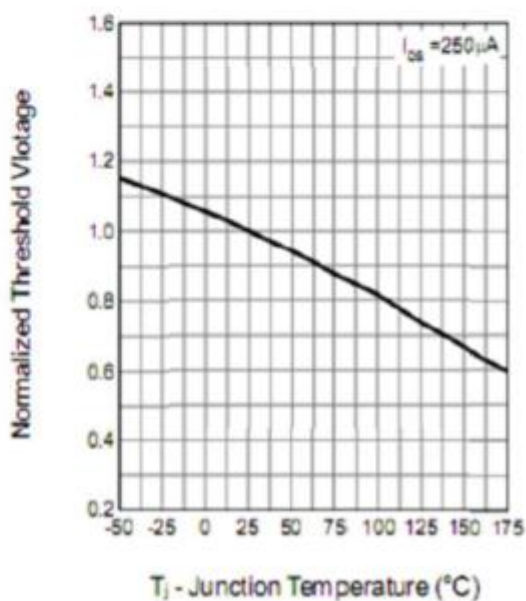**Output Characteristics**

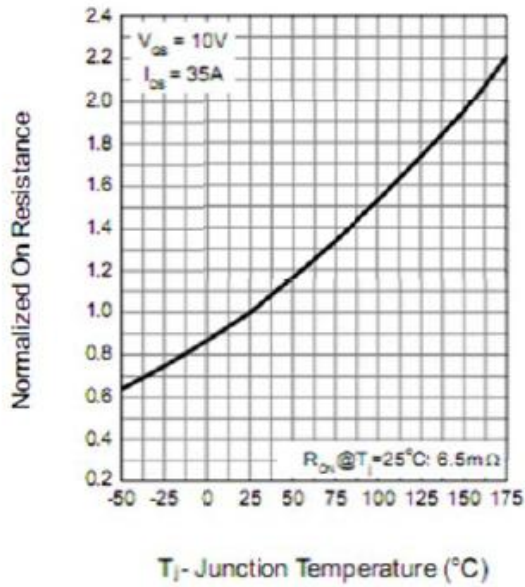**Drain-Source On Resistance**

Drain-Source On Resistance

Gate Threshold Voltage

Drain-Source On Resistance

$V_{GS} = 10V$
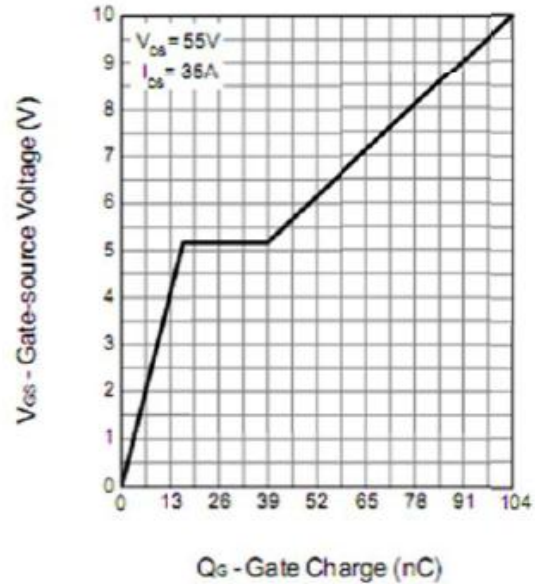$I_{DS} = 35A$

Normalized On Resistance

R_{DS}@T_j=25°C: 6.5mΩ

T_j - Junction Temperature (°C)

Source-Drain Diode Forward

I_S - Source Current (A)

T_j=175°C

T_j=25°C

V_{SD} - Source-Drain Voltage (V)

Capacitance

Frequency=1MHz

C - Capacitance (pF)

Ciss

Coss

Crss

V_{DS} - Drain - Source Voltage (V)

Gate Charge

$V_{DS} = 55V$
$I_{DS} = 35A$

V_{GS} - Gate-source Voltage (V)

Q_G - Gate Charge (nC)

Power Dissipation

Drain Current

Safe Operation Area
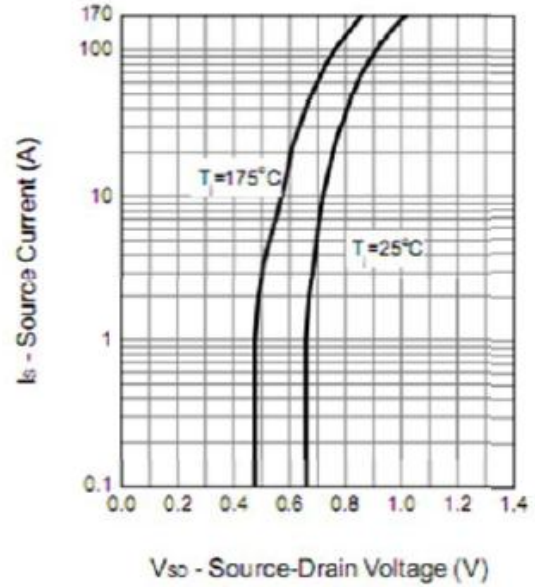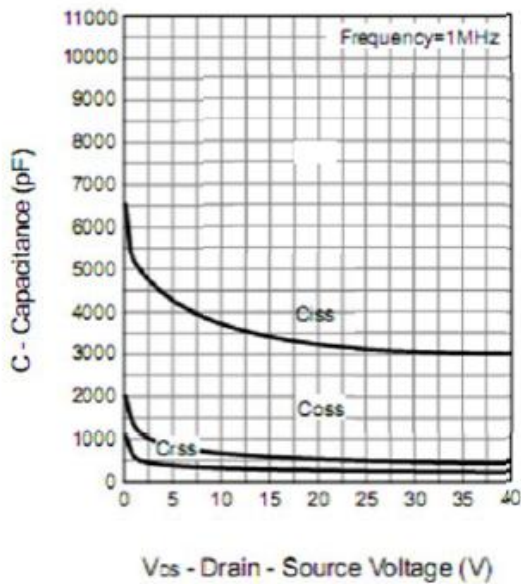
Thermal Transient Impedance
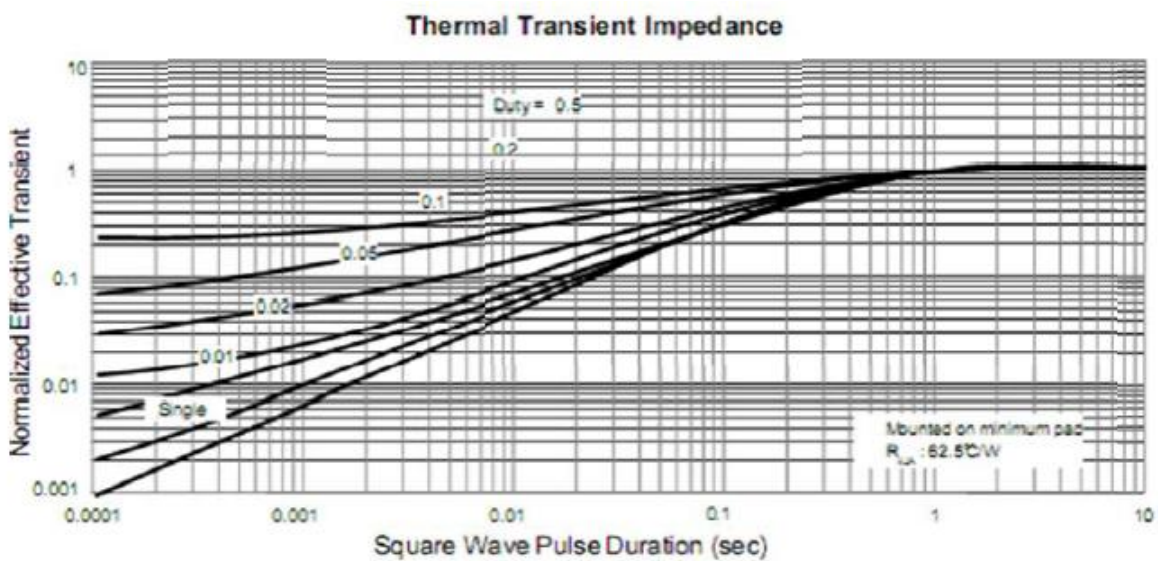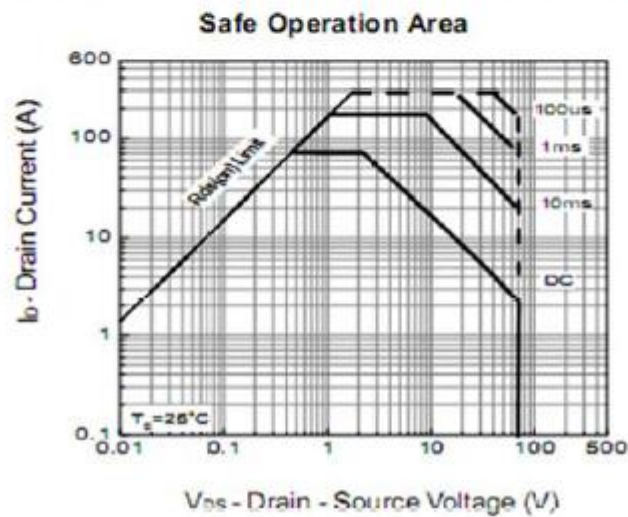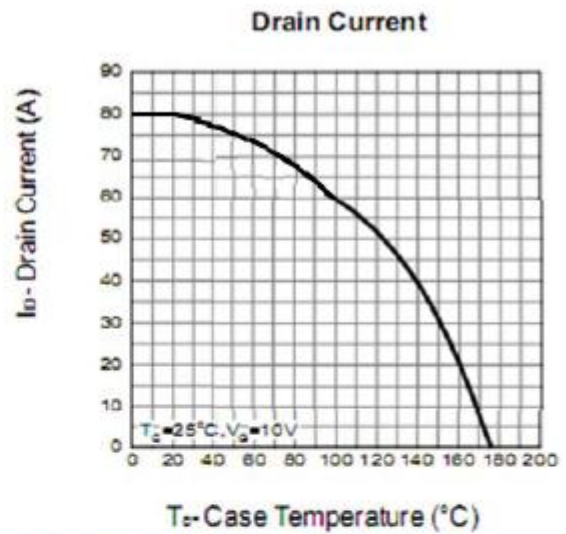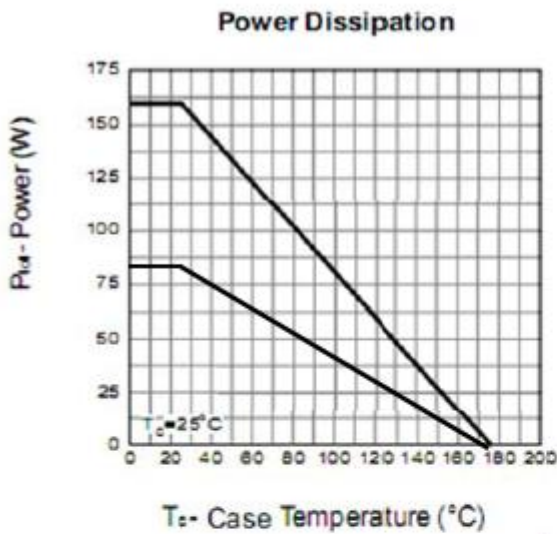
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