NIKO-SEM

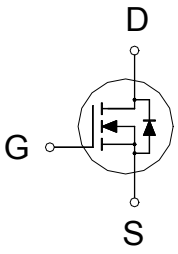
N-Channel Enhancement Mode Field Effect Transistor

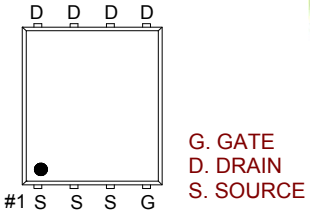
PK6A6BA
PDFN 5x6P
Halogen-Free & Lead-Free

RoHS Compliant

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	8mΩ	42A





ABSOLUTE MAXIMUM RATINGS (T_A = 25 °C Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	42	A
	T_C = 100 °C		26.6	
Pulsed Drain Current[1]		I_{DM}	100	
Continuous Drain Current	T_A = 25 °C	I_D	11	
	T_A = 70 °C		9	
Avalanche Current		I_{AS}	33.7	
Avalanche Energy	L = 0.1mH	E_{AS}	56.8	mJ
Power Dissipation	T_C = 25 °C	P_D	31	W
	T_C = 100 °C		12.5	
Power Dissipation	T_A = 25 °C	P_D	2.3	W
	T_A = 70 °C		1.5	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	$R_{\theta JA}$		54	°C / W
Junction-to-Case	$R_{\theta JC}$		4	

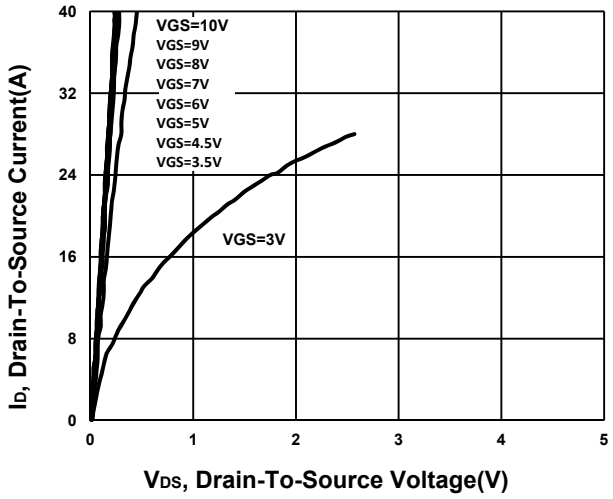
[1]Pulse width limited by maximum junction temperature.
[2]The value of $R_{\theta JA}$ is measured with the device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

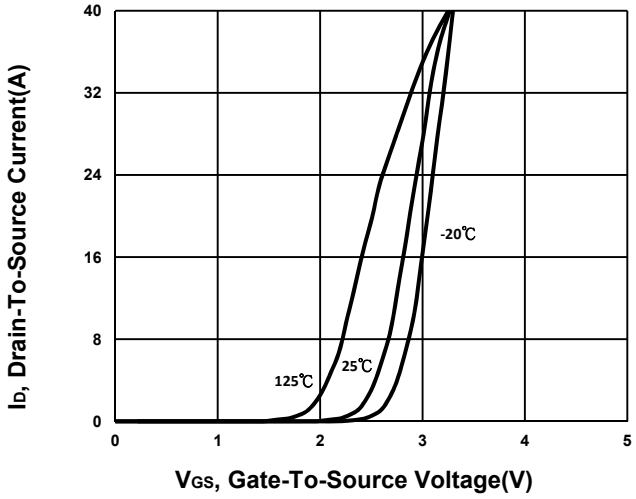
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.8	2.3	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 32V, V_{GS} = 0V			1	μA
		V_{DS} = 30V, V_{GS} = 0V, T_J = 55 °C			10	μA
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 11A		6.4	12	mΩ
		V_{GS} = 10V, I_D = 11A		5.5	8	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 11A		55		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		1672		pF
Output Capacitance	C_{oss}			206		pF
Reverse Transfer Capacitance	C_{rss}			124		pF
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.3		Ω
Total Gate Charge[2]	Q_g (V_{GS} = 10V)	V_{DS} = 15V , V_{GS} = 10V, I_D = 11A		34		nC
	Q_g (V_{GS} = 4.5V)			18		nC
Gate-Source Charge[2]	Q_{gs}			5.1		nC
Gate-Drain Charge[2]	Q_{gd}			8.3		nC
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , I_D ≅ 11A, V_{GS} = 10V, R_{GEN} =6Ω		25		nS
Rise Time[2]	t_r			11		nS
Turn-Off Delay Time[2]	$t_{d(off)}$			41		nS
Fall Time[2]	t_f			12		nS
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				24	A
Forward Voltage[1]	V_{SD}	I_F = 11A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 11A, dI_F/dt = 100A / μS		19.5		nS
Reverse Recovery Charge	Q_{rr}			9.4		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

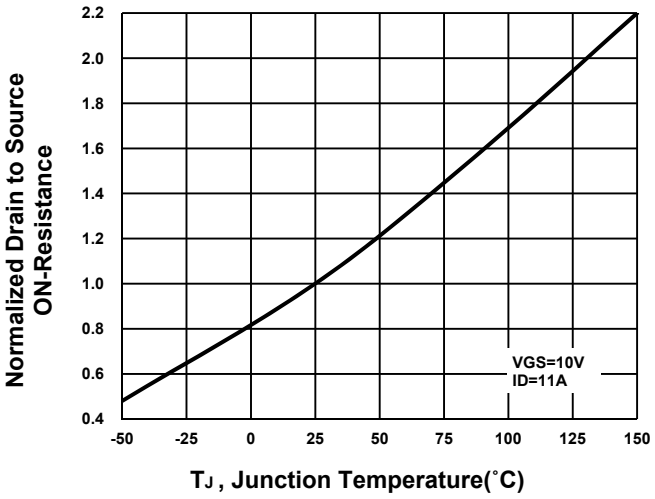
Output Characteristics



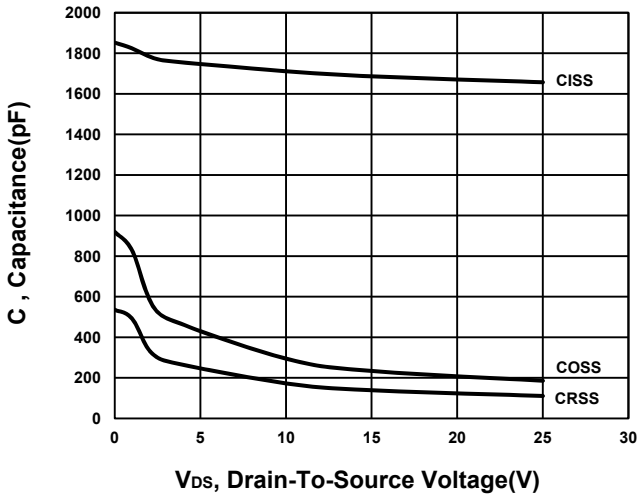
Transfer Characteristics



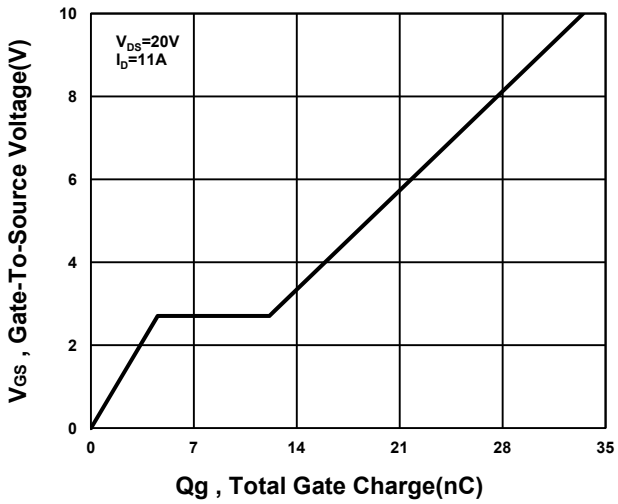
On-Resistance VS Temperature



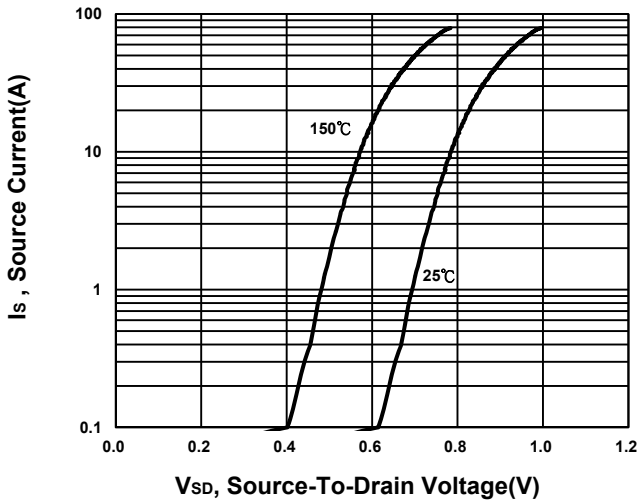
Capacitance Characteristic



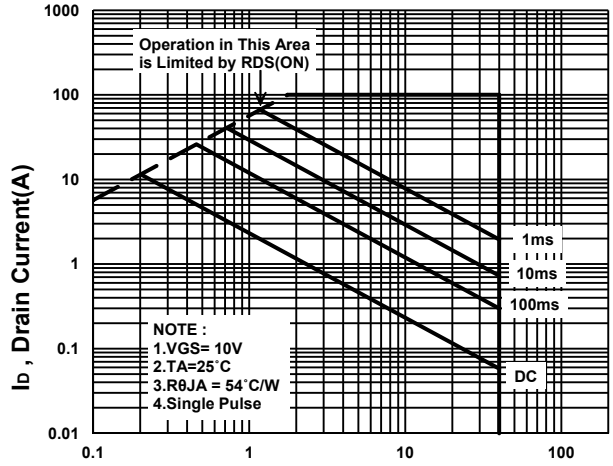
Gate charge Characteristics



Source-Drain Diode Forward Voltage

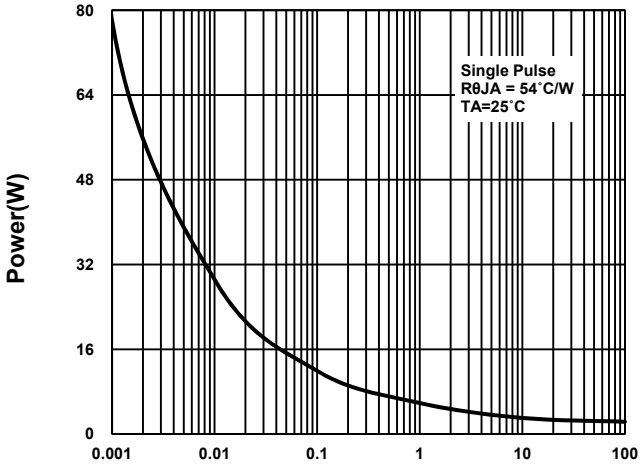


Safe Operating Area



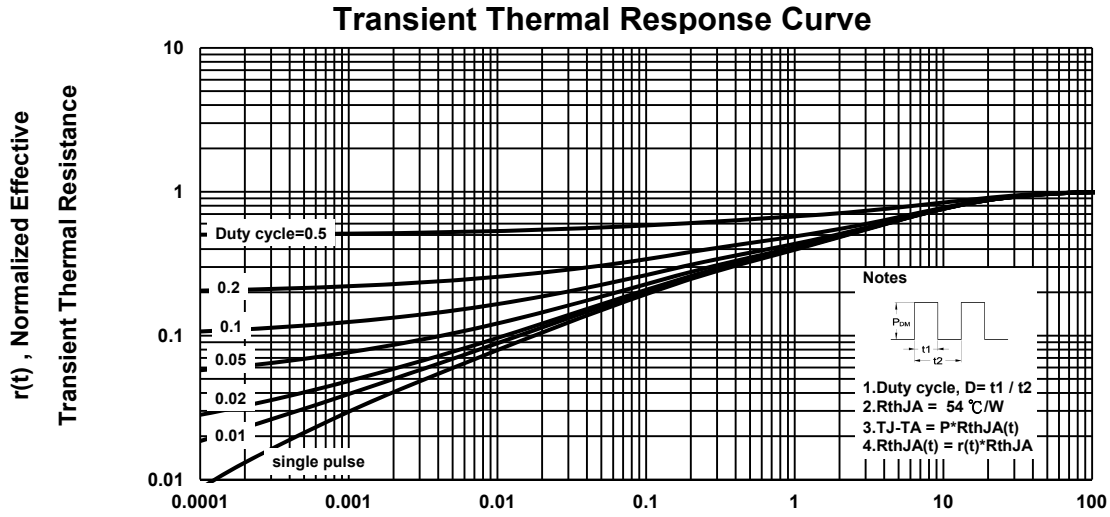
VDS, Drain-To-Source Voltage(V)

Single Pulse Maximum Power Dissipation



Single Pulse Time(s)

Transient Thermal Response Curve



T1 , Square Wave Pulse Duration[sec]

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