NIKO-SEM

Dual N-Channel Enhancement Mode Field Effect Transistor

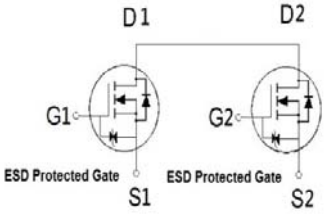
PE5C6JZ

PDFN 3x3S

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
24V	5.5mΩ	54A

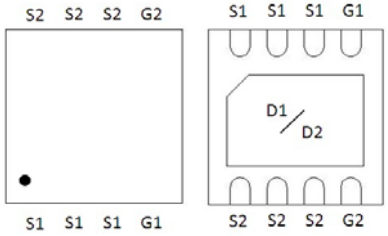


Features

- Patent Pending.
- Pb−Free, Halogen Free and RoHS compliant.
- Low $R_{DS(on)}$ to Minimize Conduction Losses.
- Ohmic Region Good $R_{DS(on)}$ Ratio.
- Optimized Gate Charge to Minimize Switching Losses.
- Products Integrated ESD diode with ESD Protected up to 2KV.

Applications

- Protection Circuits Applications.
- Protable Devices for Battery PACK Applications.



G : GATE
D : DRAIN
S : SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	24	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current[2]	T_C = 25 °C	I_D	54	A
	T_C = 100 °C		34	
	T_A = 25 °C		16	
	T_A = 70 °C		13	
Pulsed Drain Current[1]		I_{DM}	90	
Avalanche Current		I_{AS}	28	
Avalanche Energy	L = 0.1mH	E_{AS}	39	mJ
Power Dissipation	T_C = 25 °C	P_D	27	W
	T_C = 100 °C		11	
	T_A = 25 °C		2.5	
	T_A = 70 °C		1.6	
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[3]	$R_{\theta JA}$		50	°C／W
Junction-to-case	$R_{\theta JC}$		4.5	

[1]Pulse width limited by maximum junction temperature.
[2]Package limitation current is 13A.
[3]The value of $R_{\theta JA}$ is measured with the device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C.

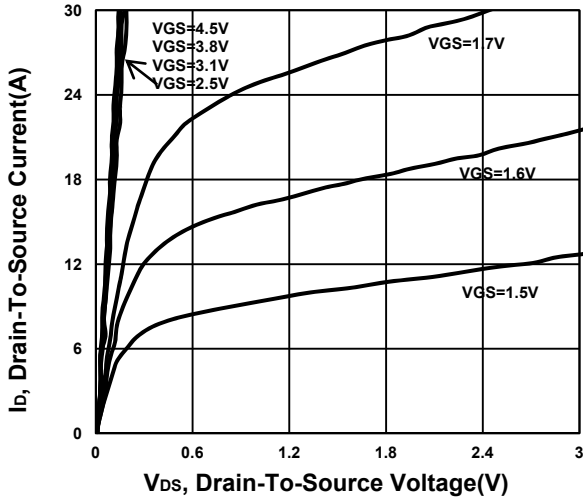
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

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	24			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.6	0.9	1.2	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±10V			±10	uA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 20V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V, T_J = 125 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 3A	3.6	4.6	5.5	mΩ
		V_{GS} = 3.8V, I_D = 3A	3.9	4.9	6	
		V_{GS} = 3.1V, I_D = 3A	4.3	5.3	6.9	
		V_{GS} = 2.5V, I_D = 3A	5	6	8.5	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 3A		24		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 12V, f = 1MHz		1774		pF
Output Capacitance	C_{oss}			327		
Reverse Transfer Capacitance	C_{rss}			267		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.8		Ω
Total Gate Charge[2]	$Q_{g(V_{GS}=4.5V)}$	V_{DS} = 12V, I_D = 3A		24		nC
	$Q_{g(V_{GS}=3.9V)}$			21.4		
Gate-Source Charge[2]	Q_{gs}			2.2		
Gate-Drain Charge[2]	Q_{gd}			9		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 12V, $I_D \cong$ 3A, V_{GEN} = 4.5V, R_G = 6Ω		20		nS
Rise Time[2]	t_r			38		
Turn-Off Delay Time[2]	$t_{d(off)}$			70		
Fall Time[2]	t_f			18		

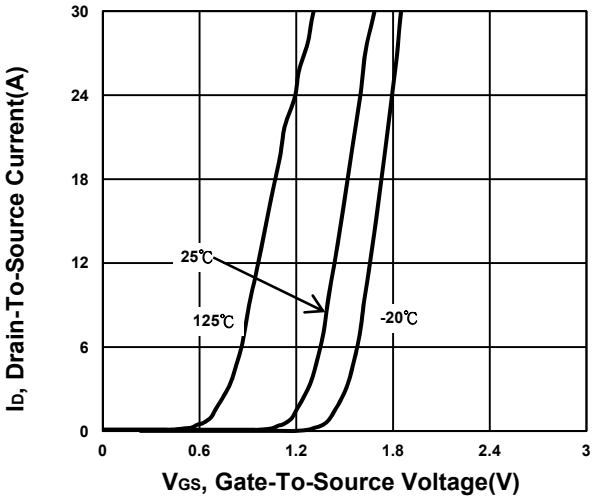
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				22	A
Forward Voltage[1]	V_{SD}	I_F = 3A, V_{GS} = 0V			1.2	V
Reverse Recovery Time	t_{rr}	I_F = 3A , dI_F/dt = 100A / μS		28		nS
Reverse Recovery Charge	Q_{rr}			13		nC

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Package limitation current is 13A.

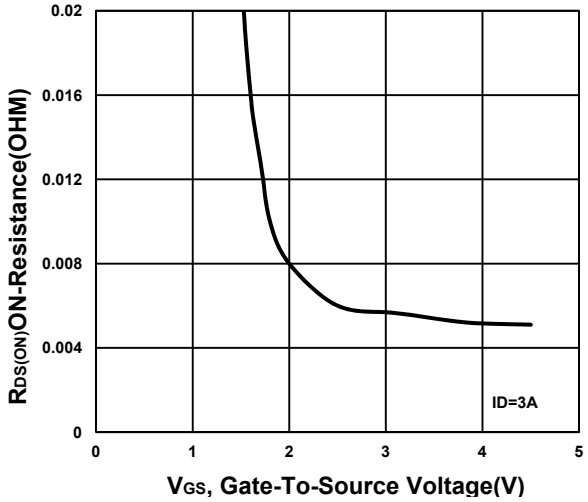
Output Characteristics



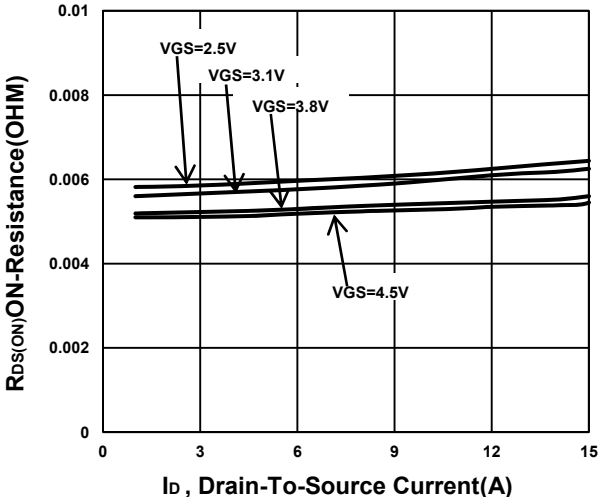
Transfer Characteristics



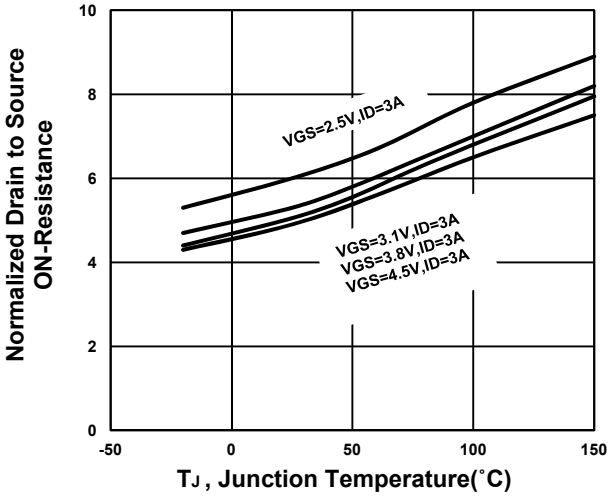
On-Resistance VS Gate-To-Source



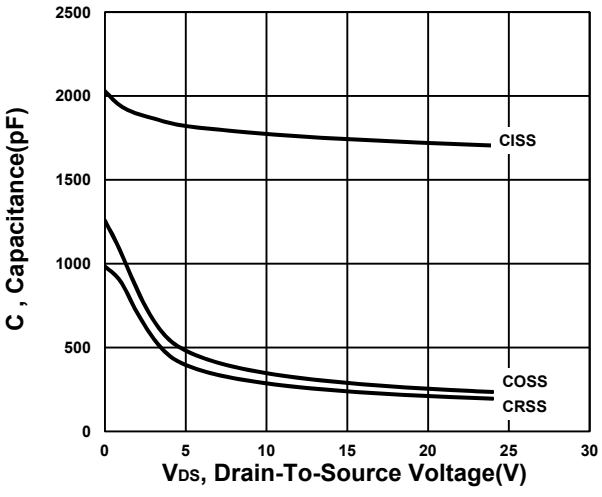
On-Resistance VS Drain Current



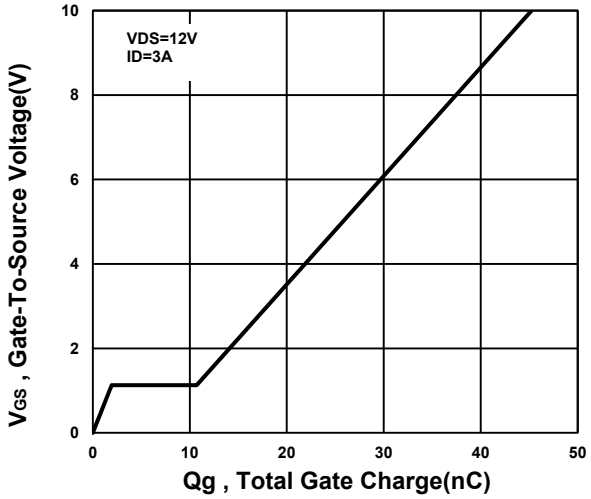
On-Resistance VS Temperature



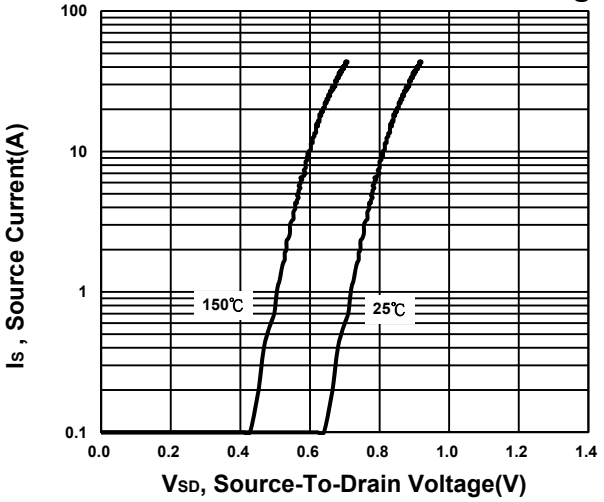
Capacitance Characteristic



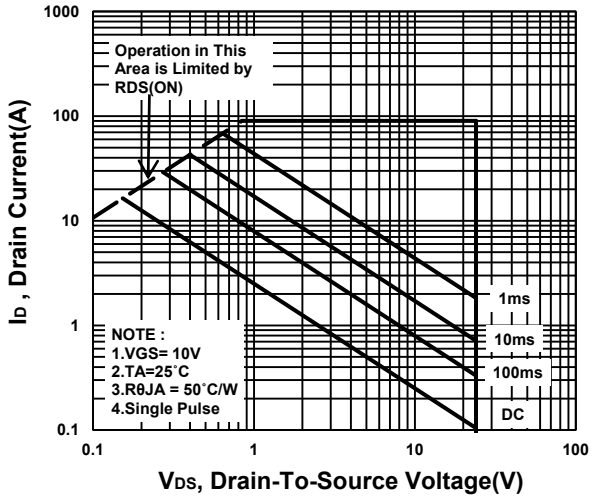
Gate charge Characteristics



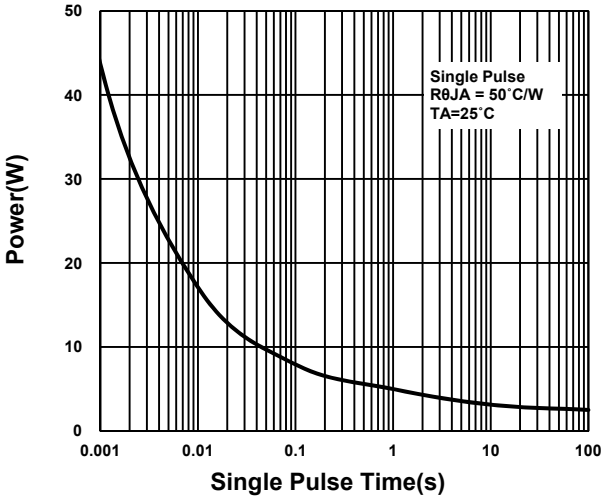
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve