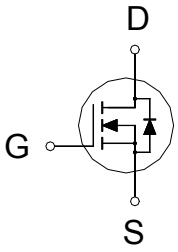
NIKO-SEM

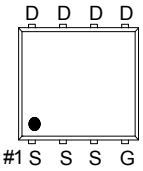
N-Channel Enhancement Mode Field Effect Transistor

PE552BA
PDFN 3x3P
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D[3]
20V	5mΩ	47A





RoHS Compliant

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}	20	V
Gate-Source Voltage		V_{GS}	±8	V
Continuous Drain Current[3]	T_C = 25 °C	I_D	47	A
	T_C = 100 °C		30	
	T_A = 25 °C		15	
	T_A = 70 °C		12	
Pulsed Drain Current[1]		I_{DM}	70	
Avalanche Current		I_{AS}	38.6	
Avalanche Energy	L = 0.1mH	E_{AS}	74.6	mJ
Power Dissipation	T_C = 25 °C	P_D	19	W
	T_C = 100 °C		7	
	T_A = 25 °C		2	
	T_A = 70 °C		1.3	
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]	$R_{\theta JA}$		60	°C / W
Junction-to-Case	$R_{\theta JC}$		6.5	

[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.
[3]Package limitation current is 22A

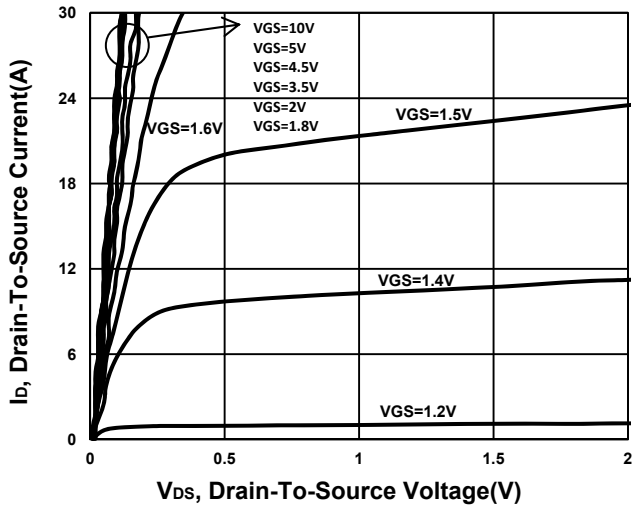
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.7	0.9	

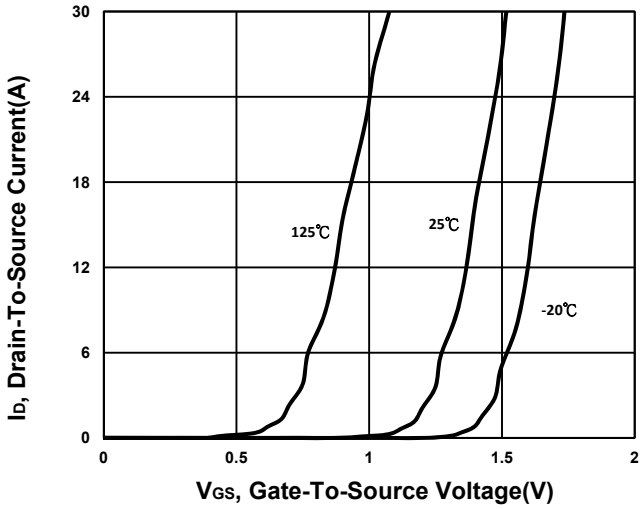
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0V			1	μA
		V_{DS} = 10V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 5A		4.1	5	mΩ
		V_{GS} = 2.5V, I_D = 5A		4.7	5.7	
		V_{GS} = 1.8V, I_D = 5A		6	8.2	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 5A		70		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		4407		pF
Output Capacitance	C_{oss}			469		
Reverse Transfer Capacitance	C_{rss}			381		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		0.7		Ω
Total Gate Charge[2]	Q_g	V_{GS}=4.5V , V_{DS} = 10V , I_D = 5A		49		nC
Gate-Source Charge[2]	Q_{gs}			6		
Gate-Drain Charge[2]	Q_{gd}			13		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 4.5V $I_D \cong$ 5A, V_{GEN} = 10V, R_G =6Ω		20		nS
Rise Time[2]	t_r			25		
Turn-Off Delay Time[2]	$t_{d(off)}$			180		
Fall Time[2]	t_f			85		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				14	A
Forward Voltage[1]	V_{SD}	I_F = 5A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 5A , dI_F/dt = 100A / μS		24		nS
Reverse Recovery Charge	Q_{rr}			12		nC

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

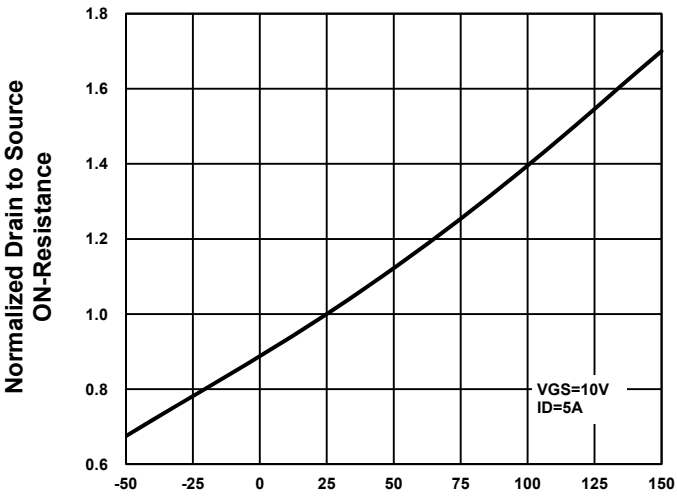
Output Characteristics



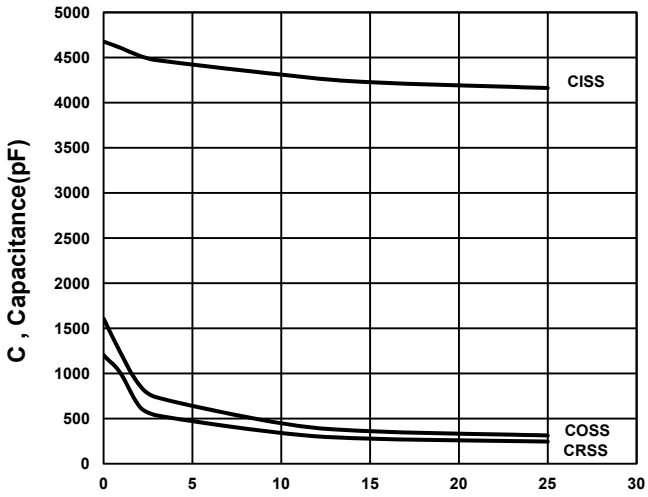
Transfer Characteristics



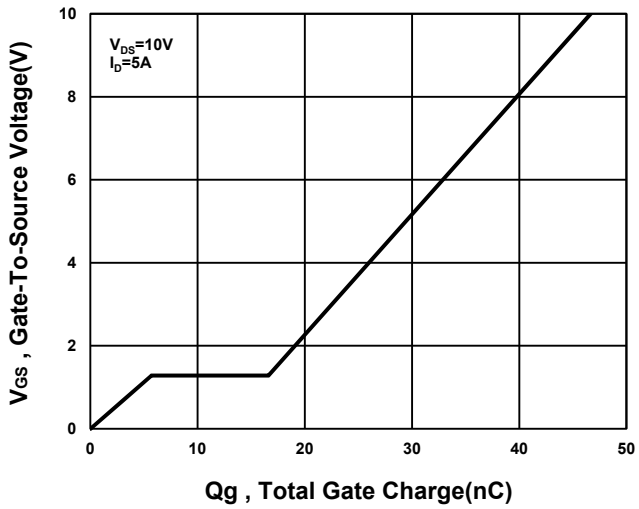
On-Resistance VS Temperature



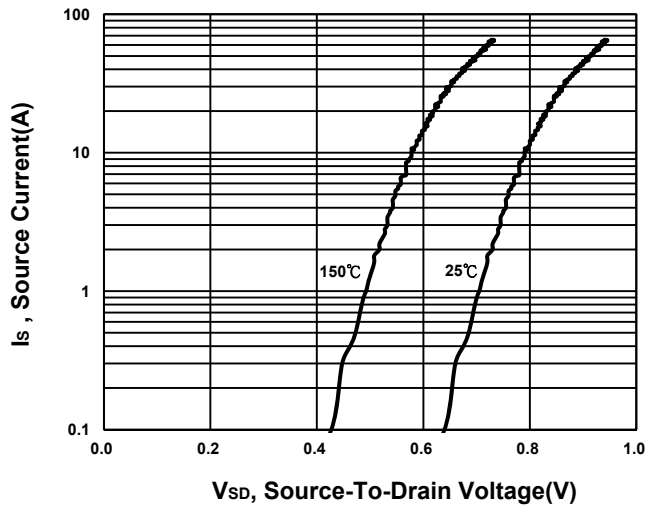
Capacitance Characteristic



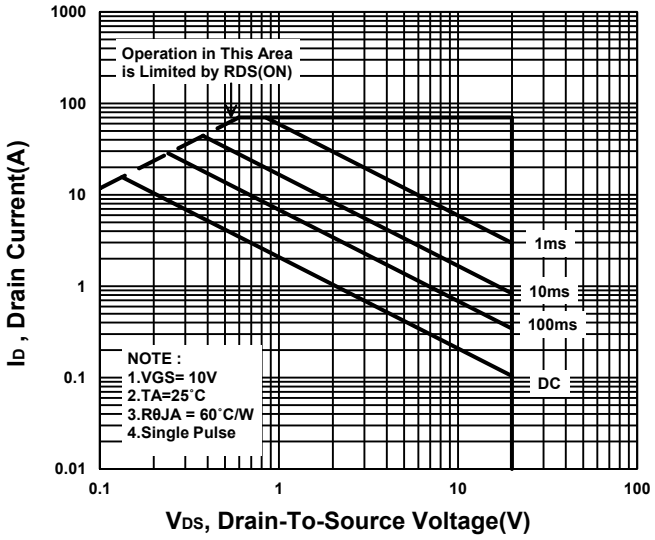
Gate charge Characteristics



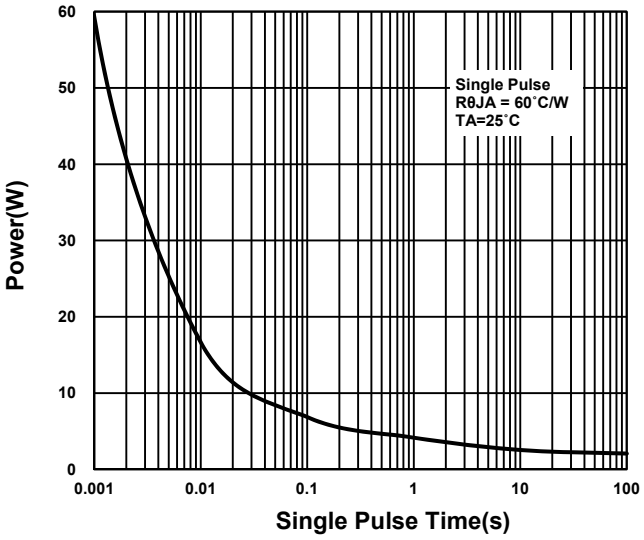
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve