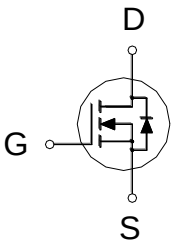
NIKO-SEM

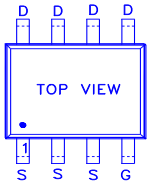
N-Channel Enhancement Mode Field Effect Transistor

PV510BA
SOP-8
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	4mΩ	22A





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}	30	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A = 25 °C	I_D	22	A
	T_A = 70 °C		17	
Pulsed Drain Current[1]		I_{DM}	100	
Avalanche Current		I_{AS}	37	
Avalanche Energy	L = 0.1mH	E_{AS}	68	mJ
Power Dissipation	T_A = 25 °C	P_D	2.7	W
	T_A = 70 °C		1.7	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		45	°C / W
Junction-to-Case	$R_{\theta JC}$		25	

[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.

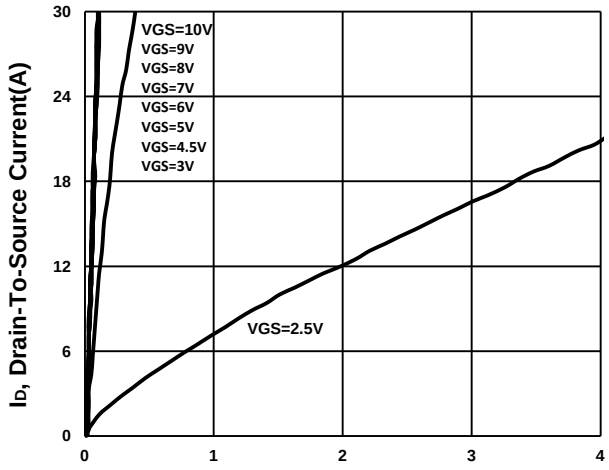
.ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 16A		3.7	5	mΩ
		V_{GS} =10V, I_D = 20A		3.2	4	

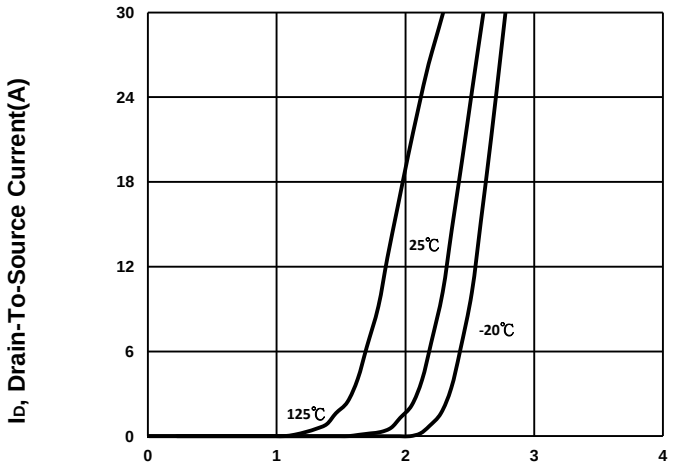
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 20A		60		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		2210		pF
Output Capacitance	C_{oss}			390		
Reverse Transfer Capacitance	C_{rss}			234		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.4		Ω
Total Gate Charge[2]	$Q_{g(VGS=10V)}$	V_{DS} = 15V , I_D =20A		44		nC
	$Q_{g(VGS=4.5V)}$			23		
Gate-Source Charge[2]	Q_{gs}			5.7		
Gate-Drain Charge[2]	Q_{gd}			13		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , $I_D \cong$ 20A, V_{GS} = 20V, R_{GEN} =6Ω		25		nS
Rise Time[2]	t_r			12		
Turn-Off Delay Time[2]	$t_{d(off)}$			56		
Fall Time[2]	t_f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				22	A
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1	V
Diode Reverse Recovery Time	t_{rr}	I_F= 20A, dI/dt=100A/μs		27		nS
Diode Reverse Recovery Charge	Q_{rr}			15		nC

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

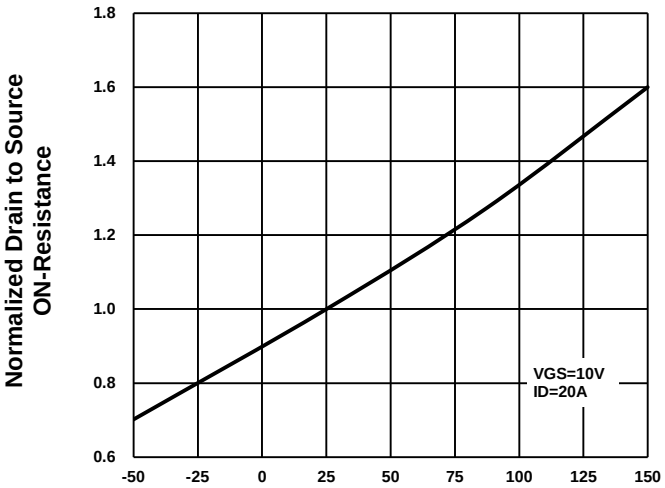
Output Characteristics



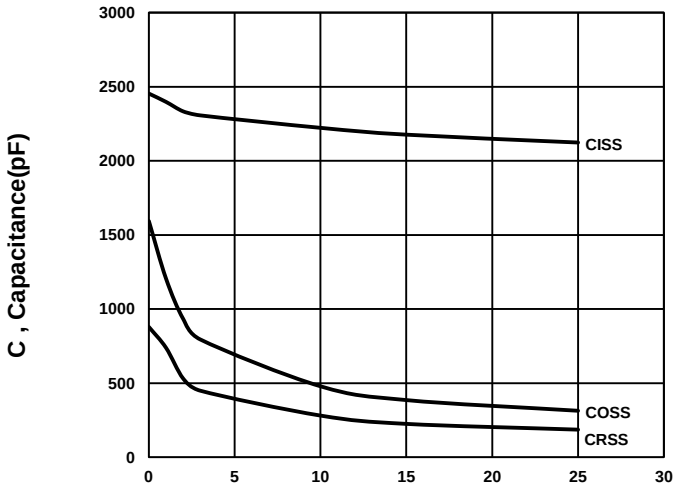
Transfer Characteristics



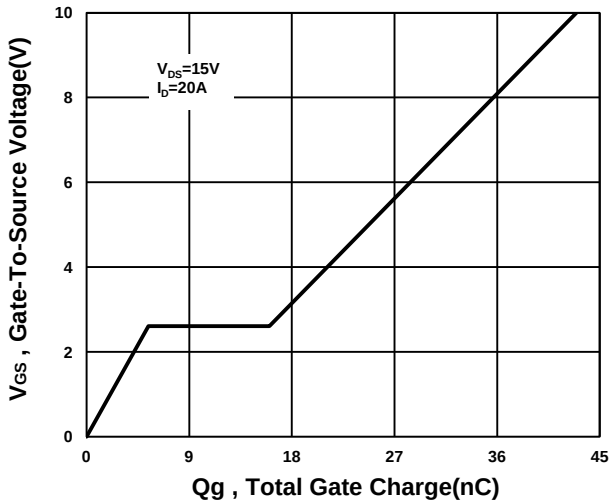
On-Resistance VS Temperature



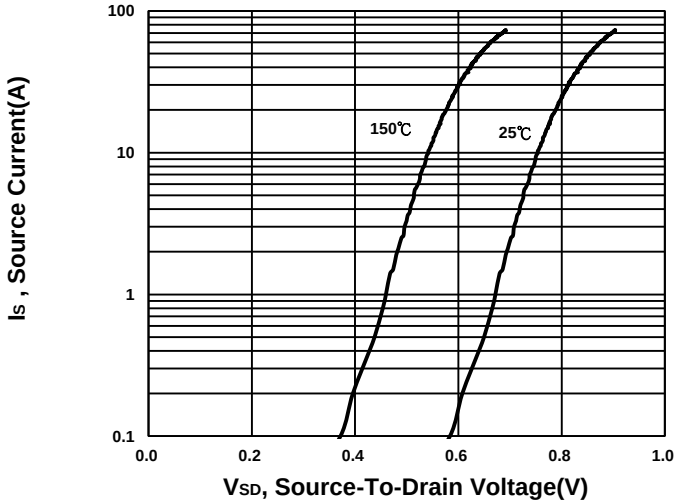
Capacitance Characteristic



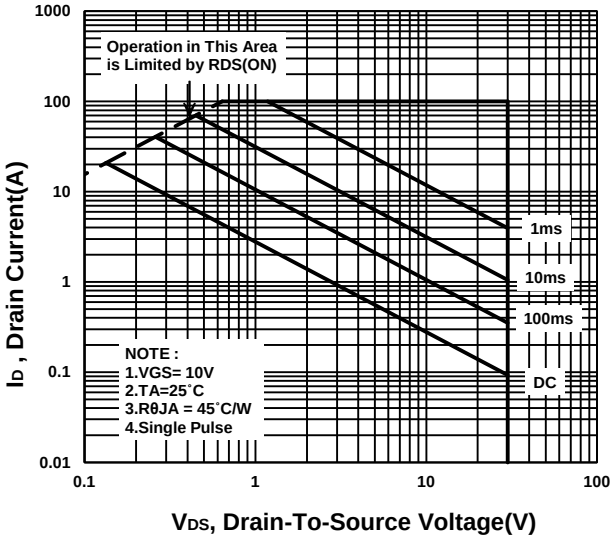
Gate charge Characteristics



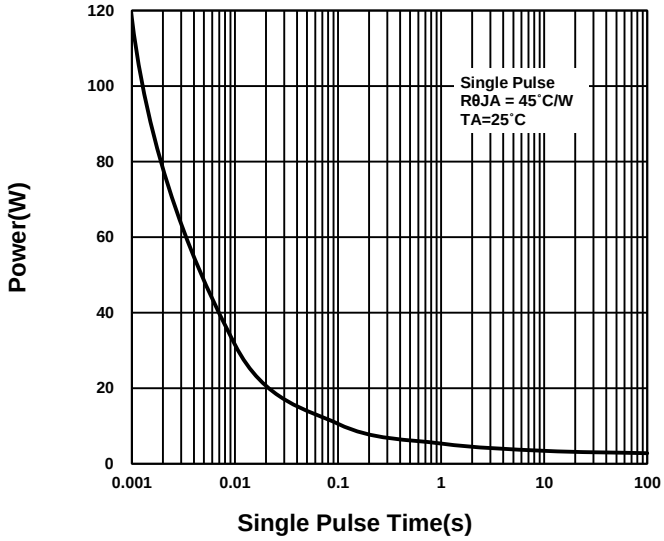
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve

