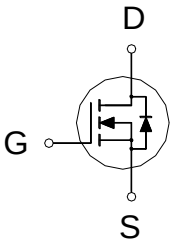
NIKO-SEM

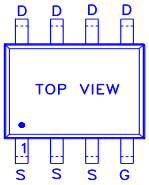
N-Channel Enhancement Mode Field Effect Transistor

P3010BV
SOP-8
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
100V	30mΩ	5.8A





G: GATE
D: DRAIN
S: SOURCE

RoHS Compliant

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	100	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_A = 25 °C	I_D	5.8	A
	T_A = 70 °C		4.6	
Pulsed Drain Current[1]		I_{DM}	37	
Avalanche Current		I_{AS}	12	
Avalanche Energy	L = 1mH	E_{AS}	72	mJ
Power Dissipation	T_A = 25 °C	P_D	2.3	W
	T_A = 70 °C		1.5	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		53	°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.

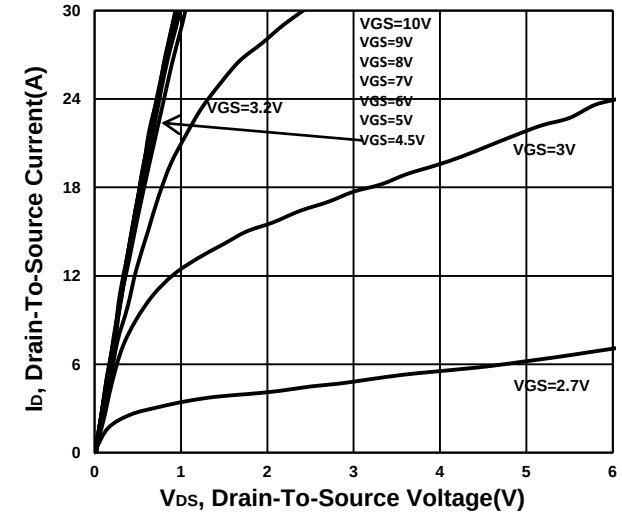
ELECTRICAL CHARACTERISTICS (T_J = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.3	1.8	2.3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 80V, V_{GS} = 0V			1	μA
		V_{DS} = 80V, V_{GS} = 0V, T_J = 55 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 5A		27	35	mΩ
		V_{GS} =10V, I_D = 5A		25.5	30	

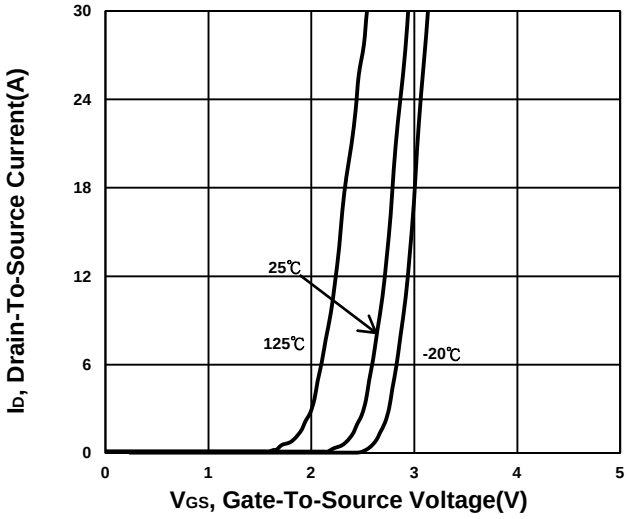
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 5A		46		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	1526	1908	2289	pF
Output Capacitance	C_{oss}		110	138	165	
Reverse Transfer Capacitance	C_{rss}		52	87	121	
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		0.8		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 50V , V_{GS} = 10V, I_D =5A	32	41	49	nC
Gate-Source Charge[2]	Q_{gs}		4.5	5.6	6.7	
Gate-Drain Charge[2]	Q_{gd}		7.5	12.5	17.5	
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 50V , $I_D \cong$ 5A, V_{GS} = 10V, R_{GEN} =6Ω		16		nS
Rise Time[2]	t_r			45		
Turn-Off Delay Time[2]	$t_{d(off)}$			47		
Fall Time[2]	t_f			38		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				1.9	A
Forward Voltage[1]	V_{SD}	I_F = 5A, V_{GS} = 0V			1.2	V
Diode Reverse Recovery Time	t_{rr}	I_F=5A, dI/dt=100A/μs		28		nS
Diode Reverse Recovery Charge	Q_{rr}			25		nC

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

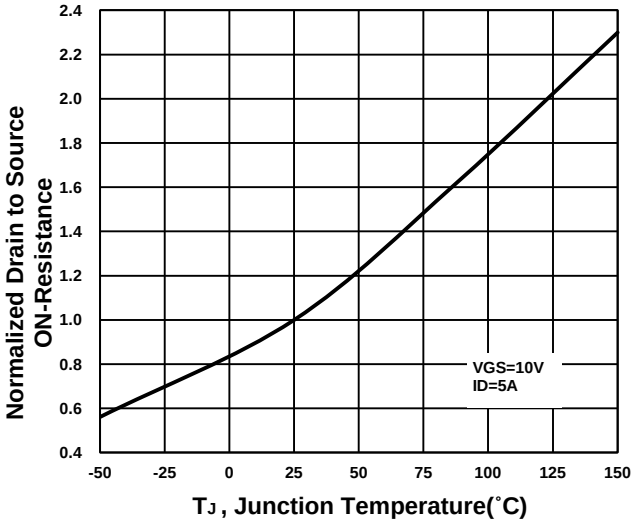
Output Characteristics



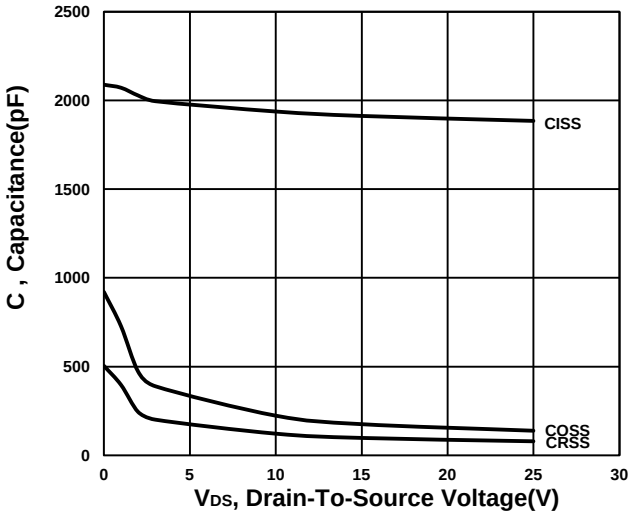
Transfer Characteristics



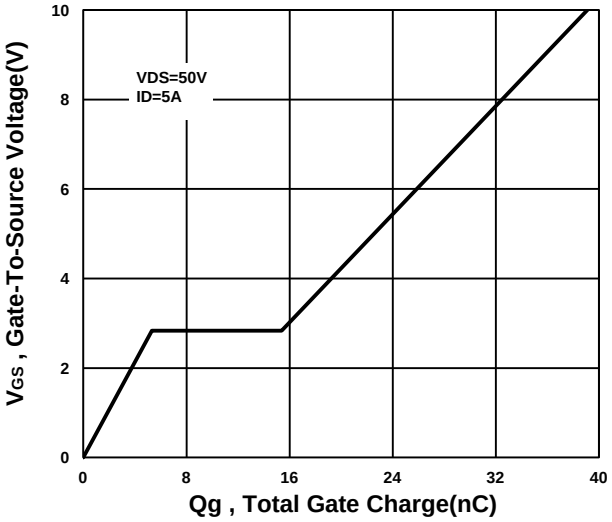
On-Resistance VS Temperature



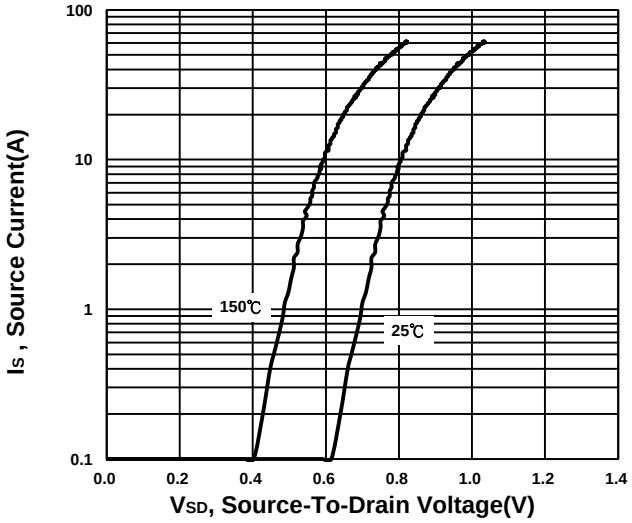
Capacitance Characteristic



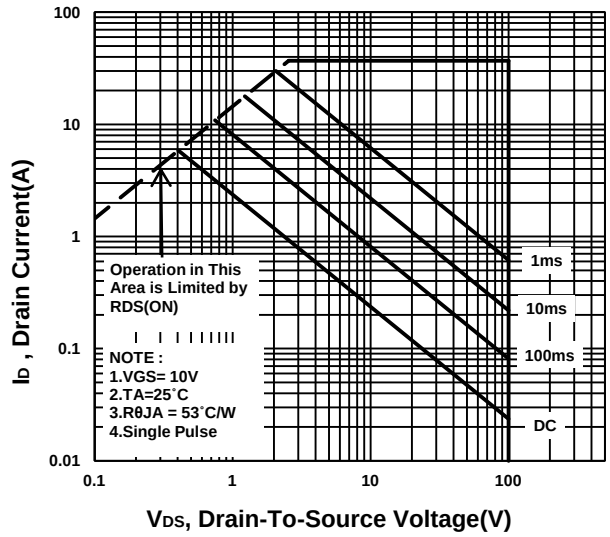
Gate charge Characteristics



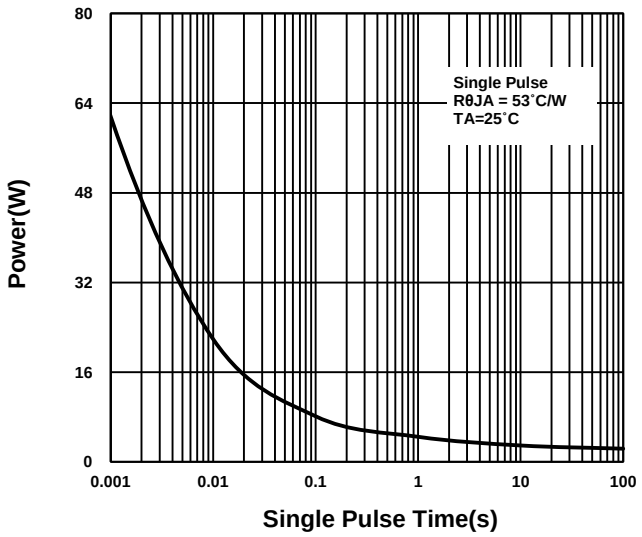
Source-Drain Diode Forward Voltage



Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve