NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

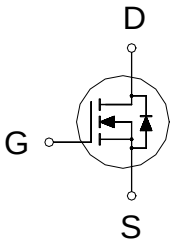
P1503BVG

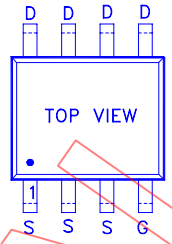
SOP-8

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30	15mΩ	11A





G : GATE
D : DRAIN
S : SOURCE

ABSOLUTE MAXIMUM RATINGS (T_C = 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_C = 25 °C	I_D	11	A
	T_C = 70 °C		7.5	
Pulsed Drain Current[1]		I_{DM}	48	
Power Dissipation	T_C = 25 °C	P_D	2.5	W
	T_C = 70 °C		2.0	
Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		50	°C / W

[1]Pulse width limited by maximum junction temperature.
[2]Duty cycle ≤ 1%

ELECTRICAL CHARACTERISTICS (T_C = 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	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.5	3.0	
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 = 10A		17.5	24	mΩ
		V_{GS} = 10V, I_D = 11A		12.5	15	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 11A		18		S

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DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		960	1200	pF
Output Capacitance	C_{oss}			150		
Reverse Transfer Capacitance	C_{rss}			120		
Gate Resistance	R_g	V_{GS} = 15mV, V_{DS} = 0V, f = 1MHz		1.5		Ω
Total Gate Charge[2](10V)	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 11A		17	26	nC
Total Gate Charge[2](4.5V)	Q_g			10	12	
Gate-Source Charge[2]	Q_{gs}			3.1		
Gate-Drain Charge[2]	Q_{gd}			6.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V , $I_D \cong$ 1A, V_{GS} = 10V, R_{GEN} = 3Ω		5.5	7	nS
Rise Time[2]	t_r			6.5	8	
Turn-Off Delay Time[2]	$t_{d(off)}$			20	26	
Fall Time[2]	t_f			5	7	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				4.5	A
Pulsed Current[3]	I_{SM}				9	
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.1	V
Reverse Recovery Time	t_{rr}	I_F = 4.5A, dI_F/dt = 100A / μS		20	25	nS

[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.
[3]Pulse width limited by maximum junction temperature.

REMARK: THE PRODUCT MARKED WITH "P1503BVG", DATE CODE or LOT #

Orders for parts with Lead-Free plating can be placed using the PXXXXXXXG parts name.

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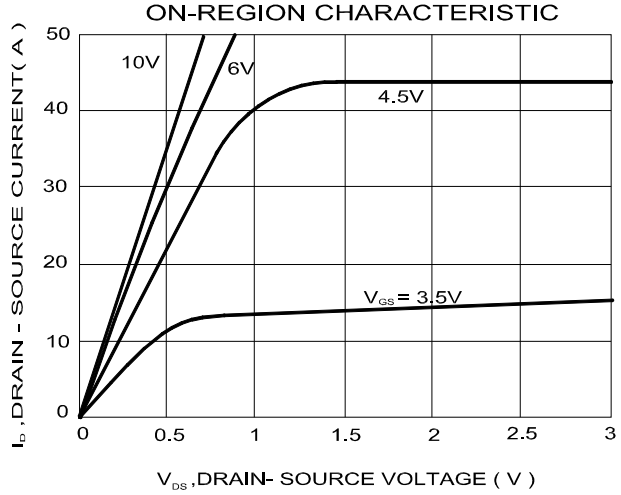
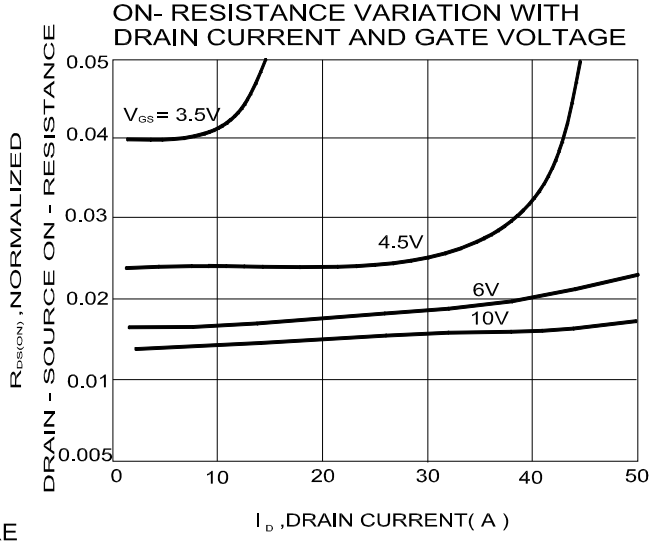
TYPICAL PERFORMANCE CHARACTERISTICS

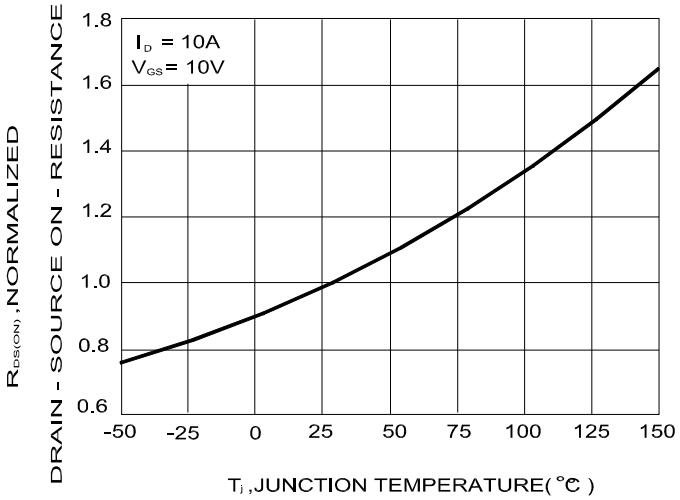
ON-REGION CHARACTERISTIC



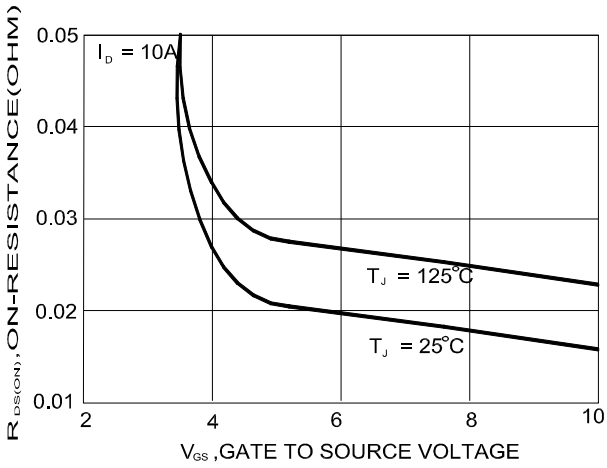
ON- RESISTANCE VARIATION WITH DRAIN CURRENT AND GATE VOLTAGE



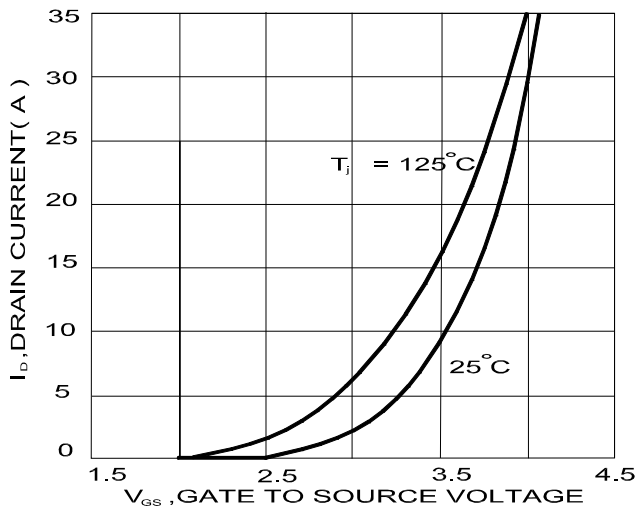
ON- RESISTANCE VARIATION WITH TEMPERATURE



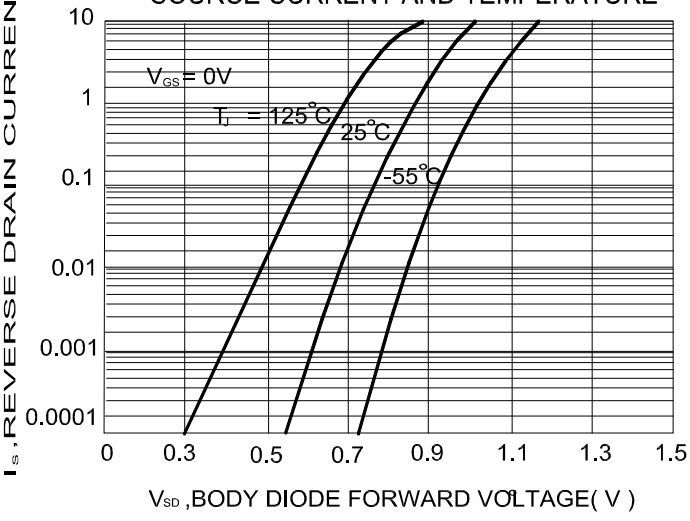
ON-RESISTANCE VARIATION WITH GATE-TO-SOURCE VOLTAGE



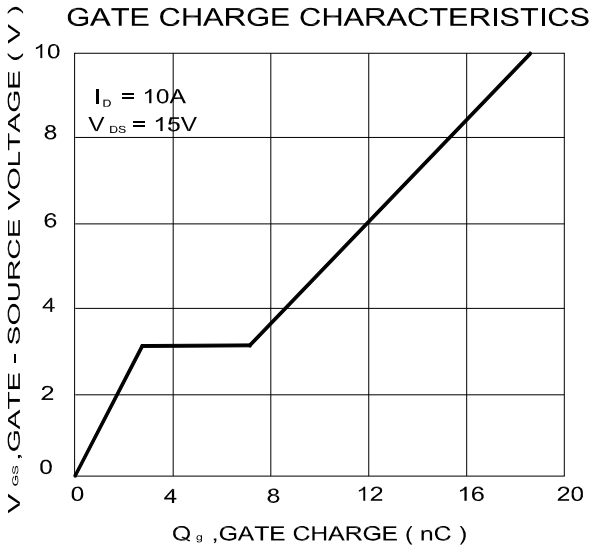
TRANSFER CHARACTERISTICS



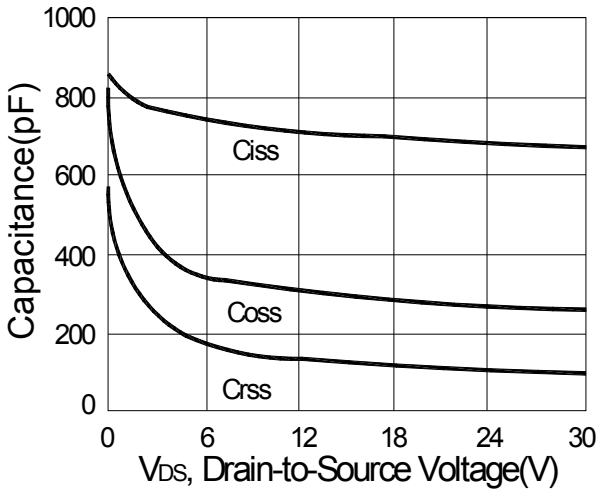
BODY DIODE FORWARD VOLTAGE VARIATION WITH SOURCE CURRENT AND TEMPERATURE



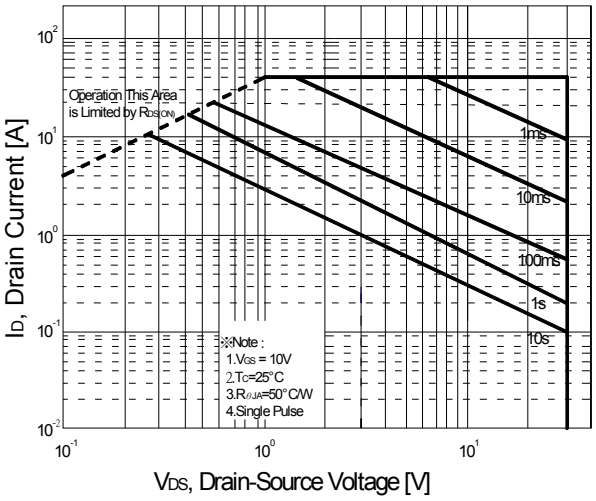
GATE CHARGE CHARACTERISTICS



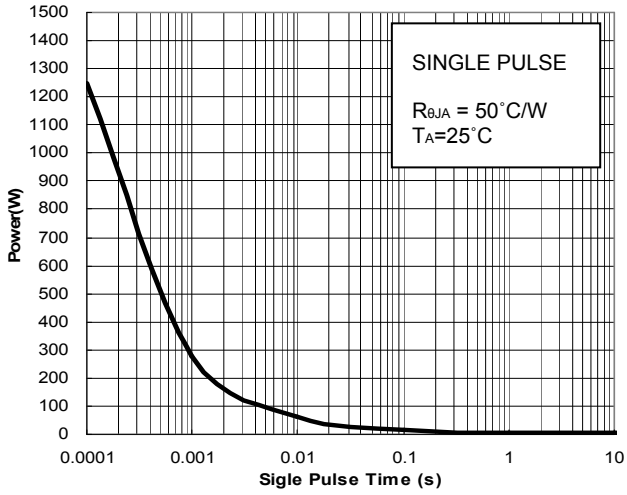
CAPACITANCE CHARACTERISTICS

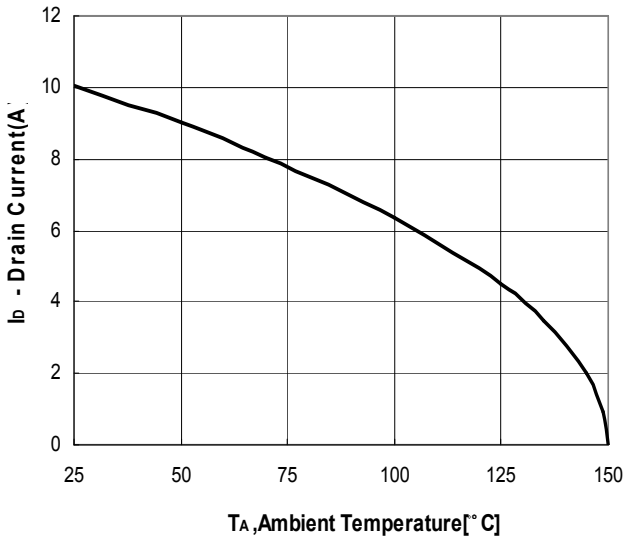


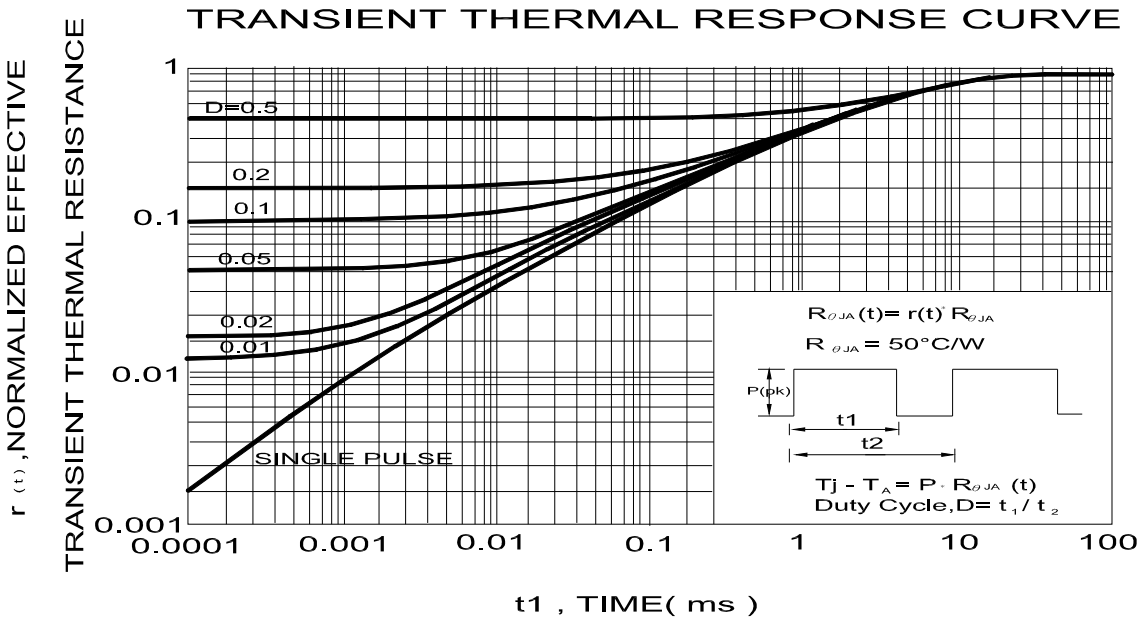
Maximum Safe Operating Area



Single Pulse Maximun Power dissipation






TRANSIENT THERMAL RESPONSE CURVE
r (t),NORMALIZED EFFECTIVE TRANSIENT THERMAL RESISTANCE
1
0.1
0.01
0.001
D=0.5
0.2
0.1
0.05
0.02
0.01
SINGLE PULSE
R θJA (t)= r(t) R θJA
R θJA = 50°C/W
P(pk)
t1
t2
Tj - TA = P R θJA (t)
Duty Cycle,D= t1 / t2
0.0001
0.001
0.01
0.1
1
10
100
t1 , TIME(ms)

SOIC-8(D) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.70	4.90	5.10	H	0.40	0.715	0.83
B	3.70	3.90	4.10	I	0.19	0.22	0.26
C	5.80	6.00	6.20	J	0.25	0.375	0.5
D	0.33	0.445	0.51	K	0°	4°	8°
E		1.27		L			
F	1.20	1.375	1.62	M			
G	0.08	0.175	0.28	N