NIKO-SEM

N-Channel Enhancement Mode Field Effect Transistor

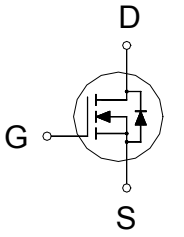
P1603BD

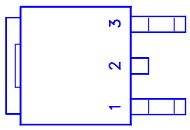
TO-252

Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
30V	14mΩ	40A





RoHS Compliant

1. GATE
2. DRAIN
3. 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_C = 25 °C	I_D	40	A
	T_C = 100 °C		32	
Pulsed Drain Current[1]		I_{DM}	150	
Avalanche Current		I_{AS}	23	
Avalanche Energy	L = 0.1mH	E_{AS}	26	mJ
Power Dissipation	T_C = 25 °C	P_D	42	W
	T_C = 100 °C		27	
Junction & Storage Temperature Range		T_J, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient	$R_{\theta JA}$		62.5	°C / W
Junction-to-Case	$R_{\theta JC}$		3	

[1]Pulse width limited by maximum junction temperature.

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

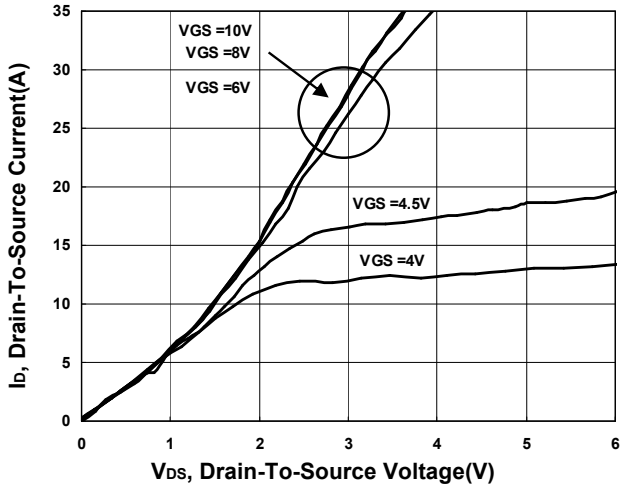
PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	1.7	2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V			1	μA
		V_{DS} = 20V, V_{GS} = 0V, T_J = 125 °C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 10V, I_D = 8A		13	14	mΩ
		V_{GS} = 4.5V, I_D = 6A		20	23	
Forward Transconductance[1]	g_{fs}	V_{DS} = 15V, I_D = 8A		21		S

On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V,	150			A
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1MHz		562		pF
Output Capacitance	C_{oss}			159		
Reverse Transfer Capacitance	C_{rss}			95		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.9		Ω
Total Gate Charge[2]	Q_g V_{GS}=10V	V_{DS} = 15V, V_{GS} = 10V, I_D = 8A		12.3		nC
	Q_g V_{GS}=4.5 V			5.2		
Gate-Source Charge[2]	Q_{gs}			1.8		
Gate-Drain Charge[2]	Q_{gd}			3.6		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 15V, $I_D \cong$ 8A, V_{GS} = 10V		21		nS
Rise Time[2]	t_r			9		
Turn-Off Delay Time[2]	$t_{d(off)}$			3		
Fall Time[2]	t_f			5		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				40	A
Forward Voltage[1]	V_{SD}	I_F = 8A, V_{GS} = 0V			1	V
Reverse Recovery Time	t_{rr}	I_F = 8A, dI_F/dt = 100A / μS		24		nS
Reverse Recovery Charge	Qrr			14		nC

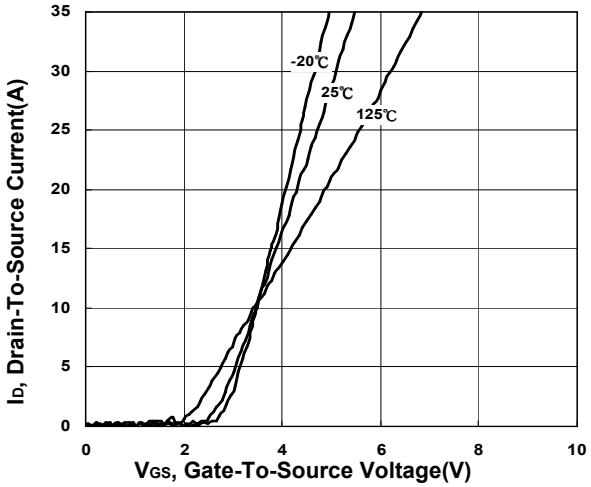
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

REMARK: THE PRODUCT MARKED WITH "P1603BD", DATE CODE or LOT #

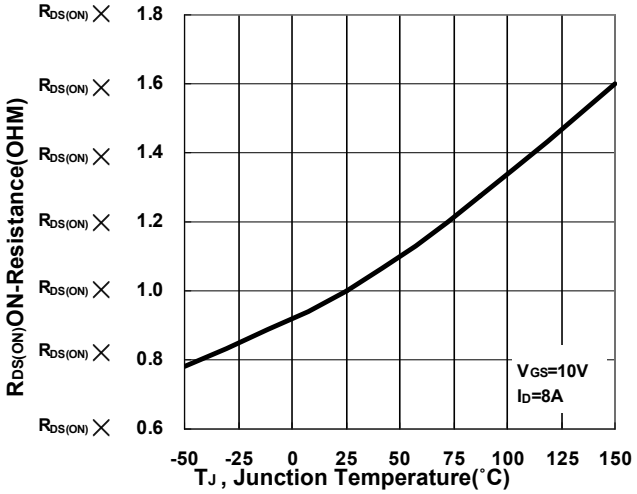
Output Characteristics



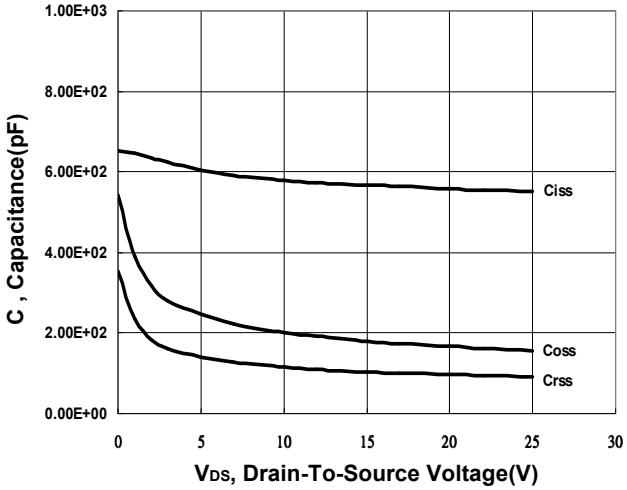
Transfer Characteristics



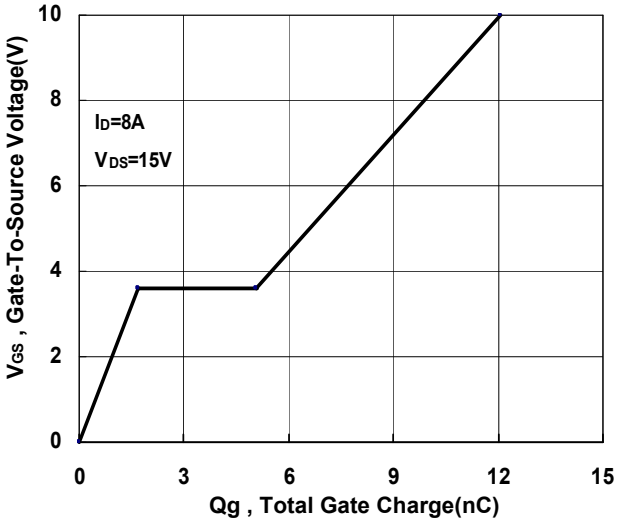
On-Resistance VS Temperature



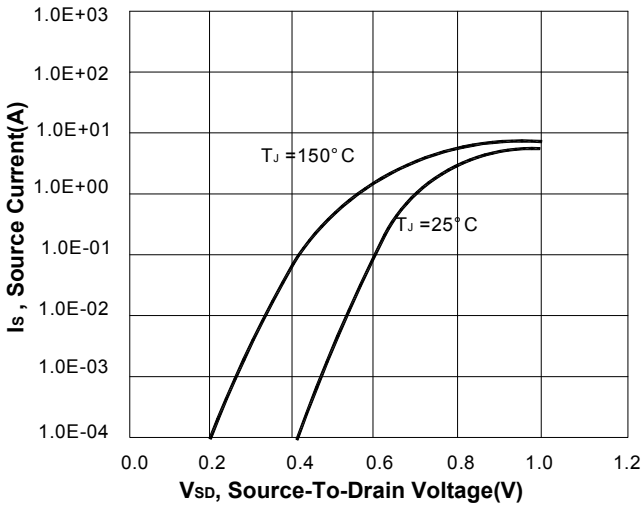
Capacitance Characteristic



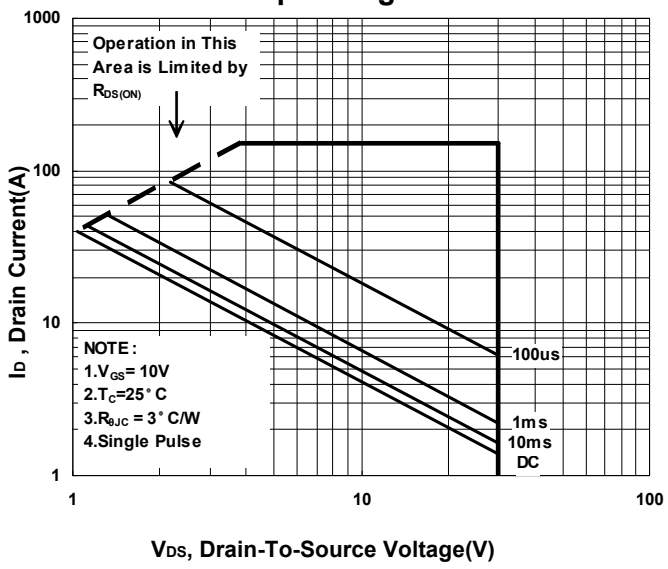
Gate charge Characteristics



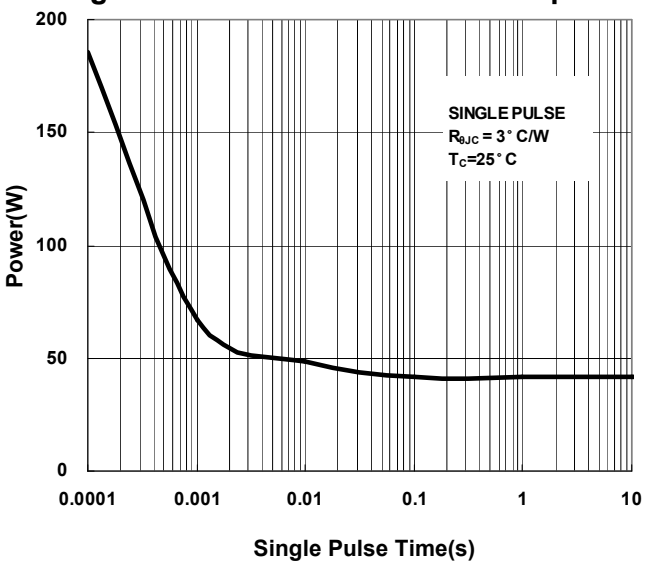
Source-Drain Diode Forward Voltage



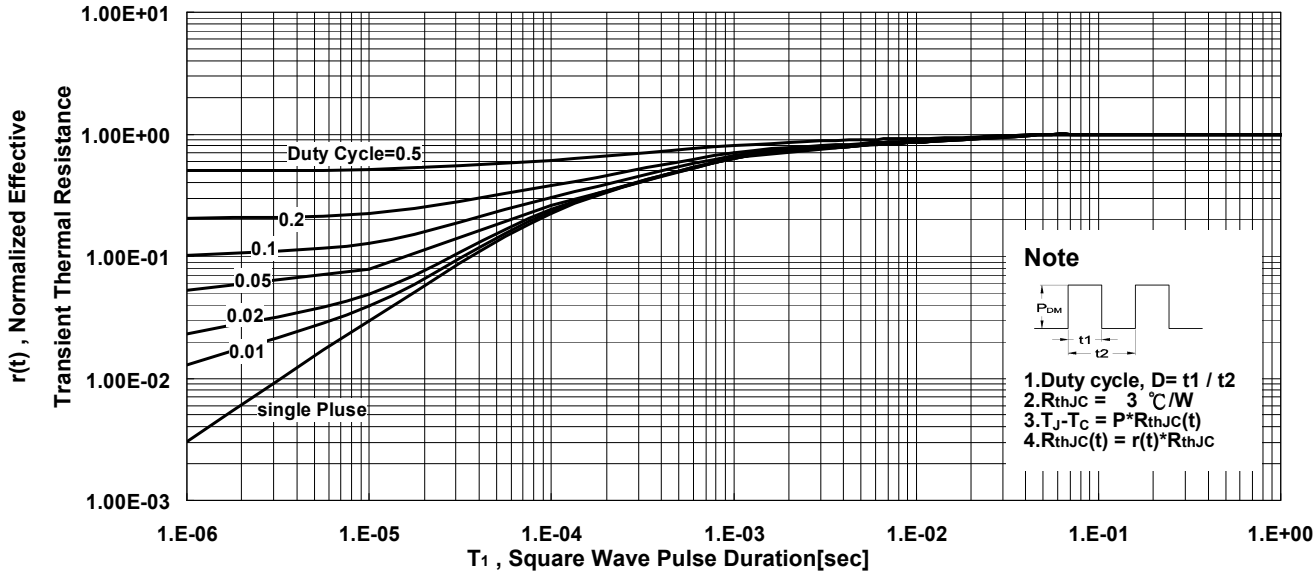
Safe Operating Area



Single Pulse Maximum Power Dissipation

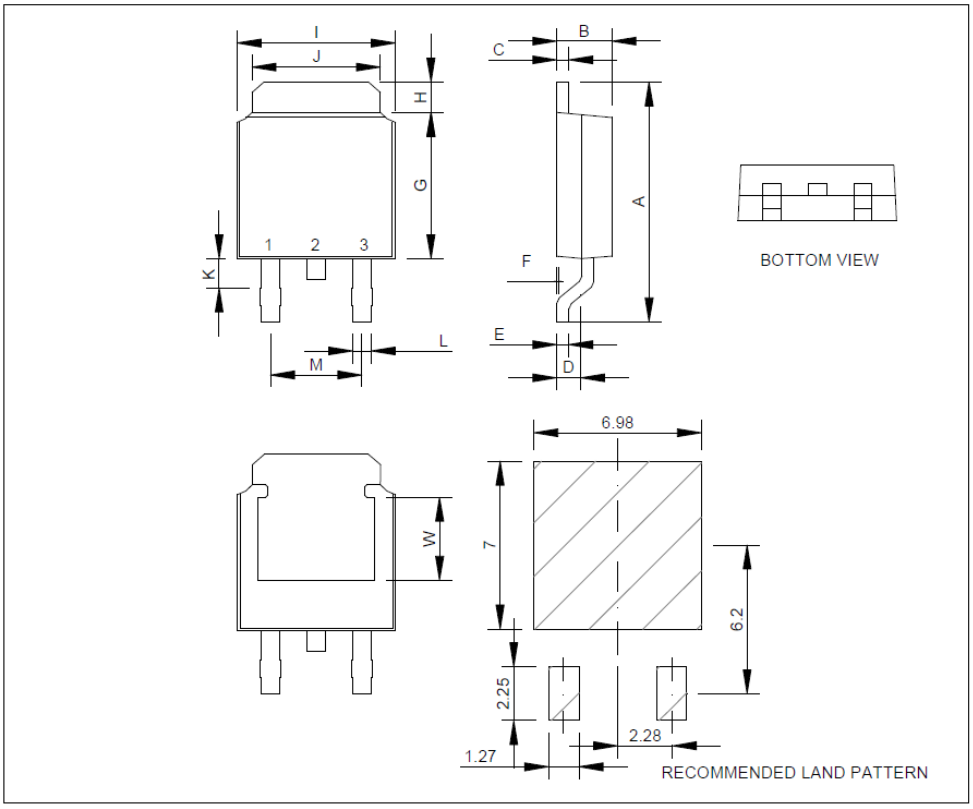


Transient Thermal Response Curve



TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	9.5	10.4	H	0.8	1.27	2.03
B	2.19	2.3	2.435	I	6.35	6.6	6.8
C	0.35	0.5	0.65	J	4.8	5.34	5.5
D	0.89		1.5	K	0.5		1.5
E	0.35		0.65	L	0.4	0.76	0.89
F	0.0		0.23	M	3.96		5.18
G	5.4		6.2	W	3.38	3.58	3.78



TO-252 (DPAK) MECHANICAL DATA 散熱片

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
S	4.57	5.249	5.6	U	1.4		3
T	3.81	4.064	5	V	0.95		1.1