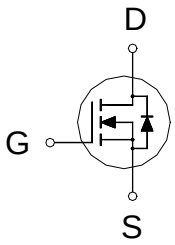
NIKO-SEM

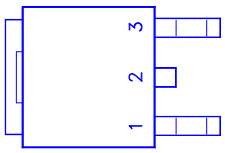
N-Channel Logic Level Enhancement Mode Field Effect Transistor

P4506BD
TO-252
Halogen-Free & Lead-Free

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
60	45mΩ	22A





1.GATE
2.DRAIN
3.SOURCE

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25 °C	I_D	22	A
	T_C = 70 °C		18	
Pulsed Drain Current[1]		I_{DM}	80	
Power Dissipation	T_C = 25 °C	P_D	42	W
	T_C = 70 °C		27	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C
Lead Temperature ($^1/_{16}$" from case for 10 sec.)		T_L	275	

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		3	°C / W
Junction-to-Ambient	$R_{\theta JA}$		75	°C / W

[1]Pulse width limited by maximum junction temperature.

ELECTRICAL CHARACTERISTICS (T_C = 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	60			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			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 48V, V_{GS} = 0V			1	µA
		V_{DS} = 40V, V_{GS} = 0V, T_J = 55 °C			10	

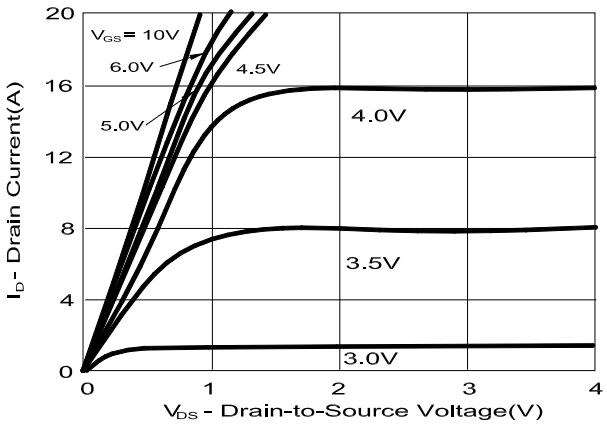
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 10V	80			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 5V, I_D = 10A		42	60	mΩ
		V_{GS} = 10V, I_D = 15A		35	45	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 15A		15		S

DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		790		pF
Output Capacitance	C_{oss}			98		
Reverse Transfer Capacitance	C_{rss}			42		
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 5A		15.2	22	nC
Gate-Source Charge[2]	Q_{gs}			2.9		
Gate-Drain Charge[2]	Q_{gd}			3.2		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 30V, $I_D \cong$ 1A, V_{GS} = 10V, R_{GEN} = 6Ω		13.5	24	nS
Rise Time[2]	t_r			9.8	18	
Turn-Off Delay Time[2]	$t_{d(off)}$			23	40	
Fall Time[2]	t_f			7.2	16	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_C = 25 °C)						
Continuous Current	I_S				15	A
Forward Voltage[1]	V_{SD}	I_F = I_S, V_{GS} = 0V			1.3	V

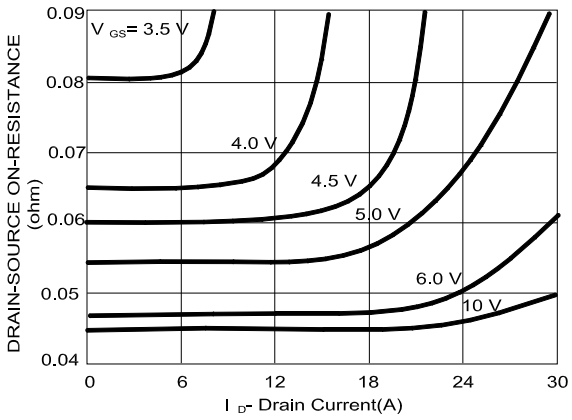
[1]Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.
[2]Independent of operating temperature.

REMARK: THE PRODUCT MARKED WITH "P4506BD", DATE CODE or LOT #

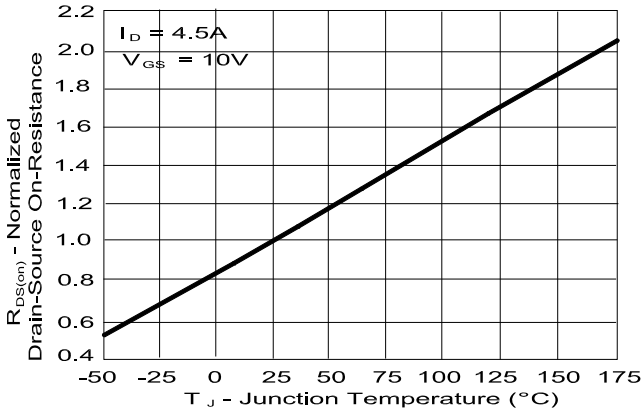
On-Region Characteristics



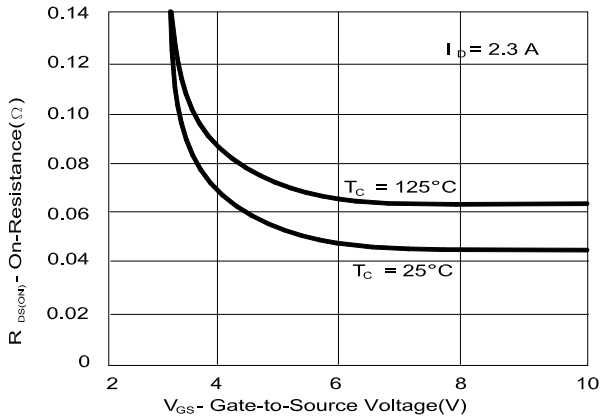
On-Resistance Variation with Drain Current and Gate Voltage



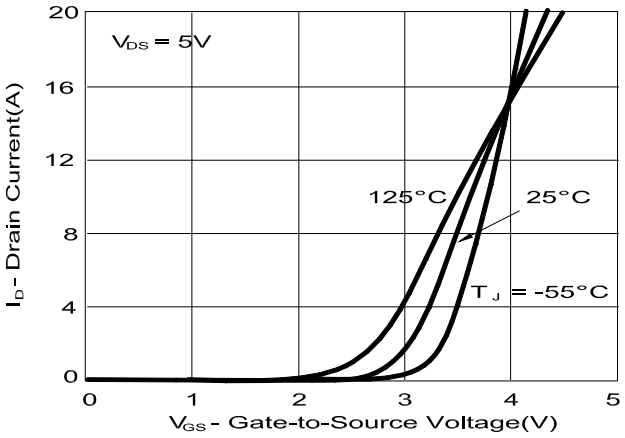
On-Resistance Variation with Temperature



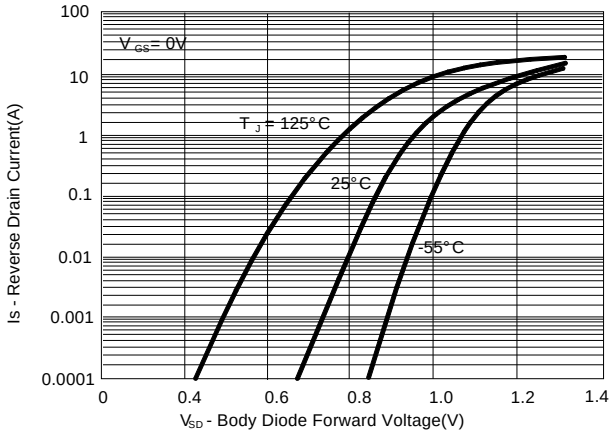
On-Resistance Variation with Gate-to-Source Voltage

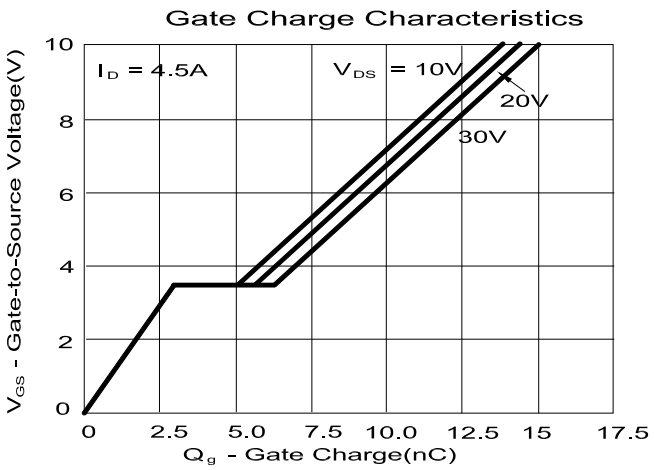


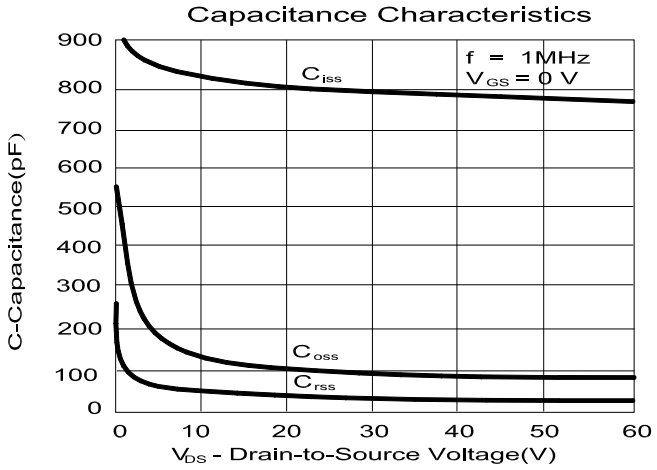
Transfer Characteristics

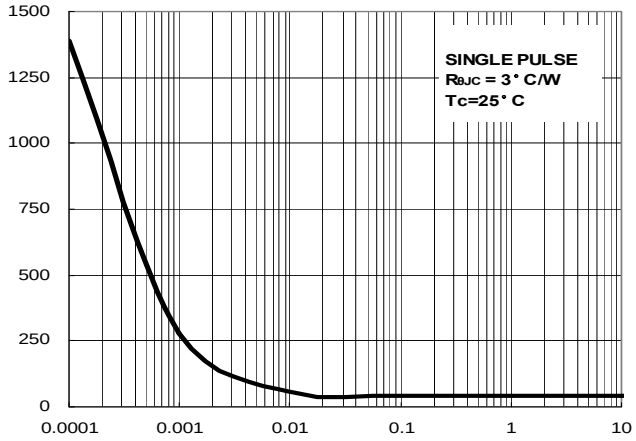


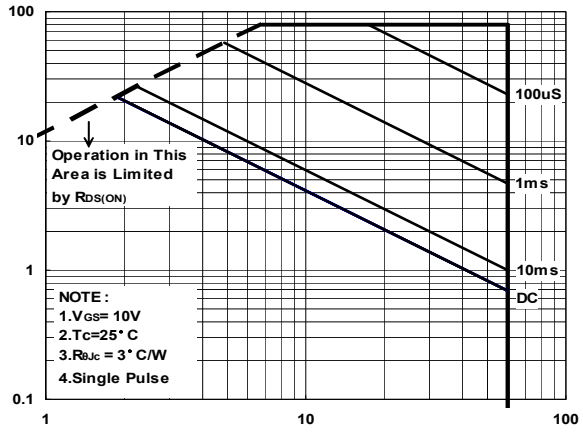
Body Diode Forward Voltage Variation with Source Current and Temperature



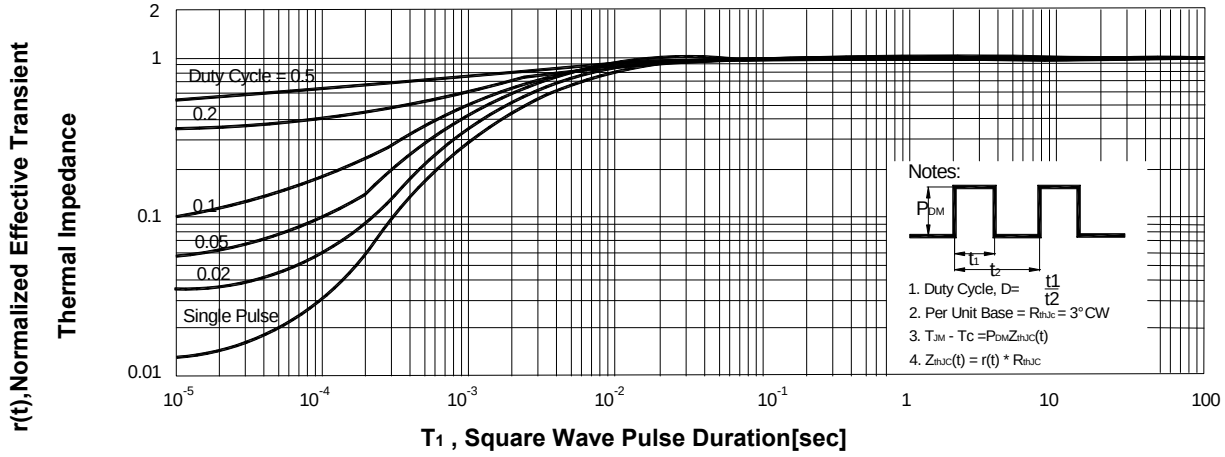








Transient Thermal Response Curve



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	N