UNIKC Semiconductor

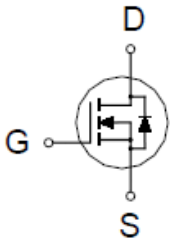
P0502CEA

N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
20V	5mΩ @V_{GS} = 4.5V	70A

PDFN 3x3P



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	20	V
Gate-Source Voltage		V_{GS}	±8	
Continuous Drain Current[1,2]	T_C = 25 °C	I_D	70	A
	T_C = 100 °C		44	
	T_A = 25 °C		17	
	T_A = 70 °C		13	
Pulsed Drain Current[1]		I_{DM}	150	
Avalanche Current		I_{AS}	58	
Avalanche Energy	L = 0.1mH	E_{AS}	173	mJ
Power Dissipation	T_C = 25 °C	P_D	40	W
	T_C = 100 °C		16	
	T_A = 25 °C		2.3	
	T_A = 70 °C		1.4	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

UNIKC Semiconductor

RoHS Compliant

P0502CEA

N-Channel Enhancement Mode MOSFET

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[3]	$R_{\theta JA}$		54	°C / W
Junction-to-Case	$R_{\theta JC}$		3.1	

[1]Pulse width limited by maximum junction temperature.

[2]Package limitation current is 38A.

[3]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.The value in any given application depends on the user's specific board design.

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

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	20			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	0.4	0.6	0.7	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±8V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 16V, V_{GS} = 0V			1	μA
		V_{DS} = 10V, V_{GS} = 0V , T_J = 55 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 5V, V_{GS} = 5V	150			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 5A		4	5	mΩ
		V_{GS} = 2.5V, I_D = 5A		5	5.7	
		V_{GS} = 1.8V, I_D = 5A		6.7	8.2	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D =5A		45		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 10V, f = 1MHz		3110		pF
Output Capacitance	C_{oss}			635		
Reverse Transfer Capacitance	C_{rss}			607		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		2		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, I_D = 5A, V_{GS}=4.5V		53		nC
Gate-Source Charge[2]	Q_{gs}			5		
Gate-Drain Charge[2]	Q_{gd}			18.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 0.5$V_{(BR)DSS}$, $I_D \cong$ 5A, V_{GS} = 4.5V, R_{GEN} = 6Ω		14		nS
Rise Time[2]	t_r			12		
Turn-Off Delay Time[2]	$t_{d(off)}$			70		
Fall Time[2]	t_f			27		

UNIKC Semiconductor

RoHS Compliant

P0502CEA

N-Channel Enhancement Mode MOSFET

SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS						
Continuous Current	I_S				70	A
Forward Voltage[1]	V_{SD}	I_S = 5A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 5A, dI_F/dt = 100A / μS		38		nS
Reverse Recovery Charge	Q_{rr}			27		nC

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

[2]Independent of operating temperature.

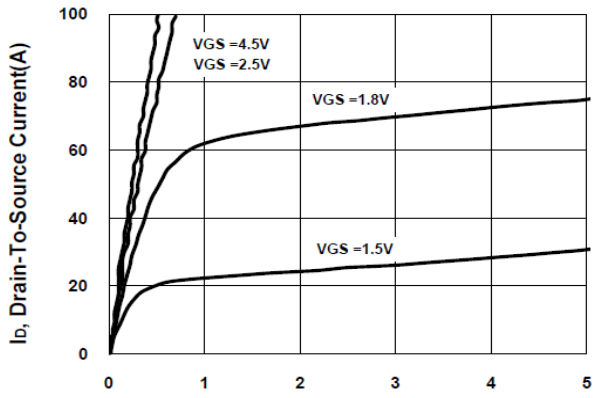
UNIKC Semiconductor

RoHS Compliant

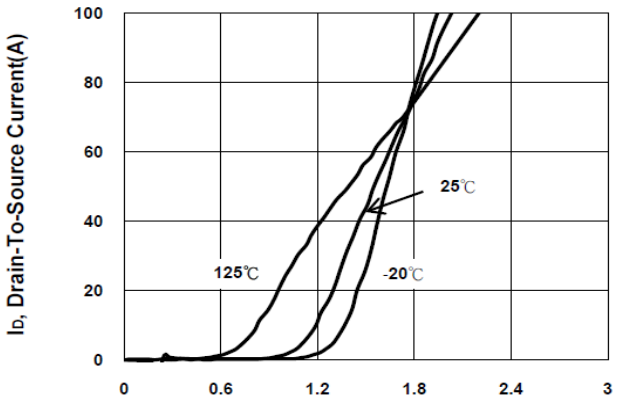
P0502CEA

N-Channel Enhancement Mode MOSFET

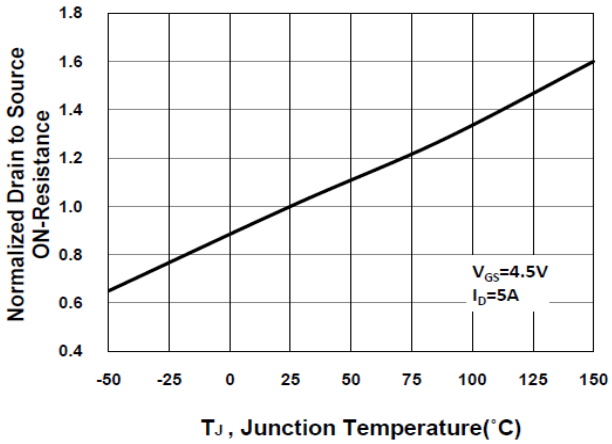
Output Characteristics



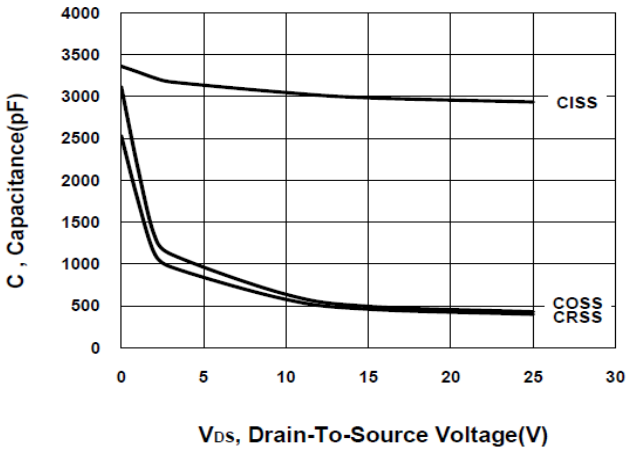
Transfer Characteristics



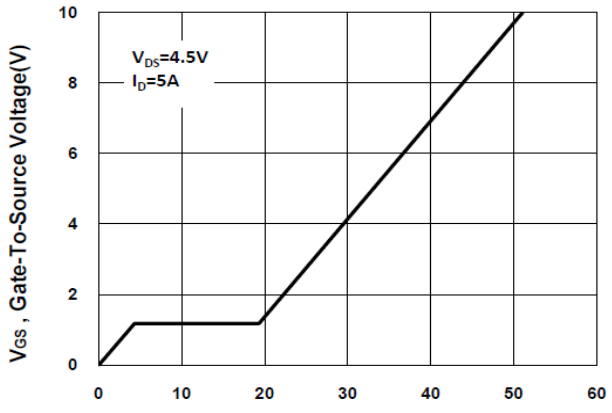
On-Resistance VS Temperature



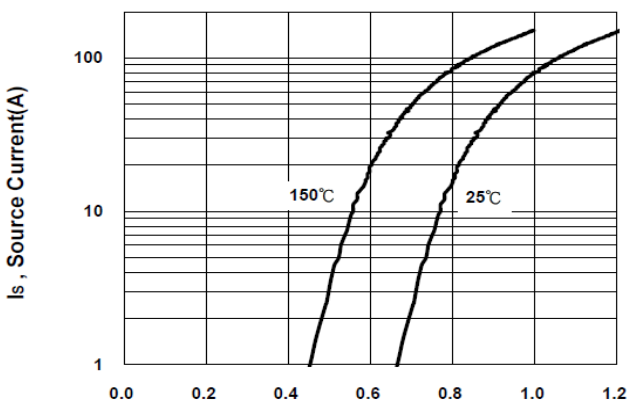
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



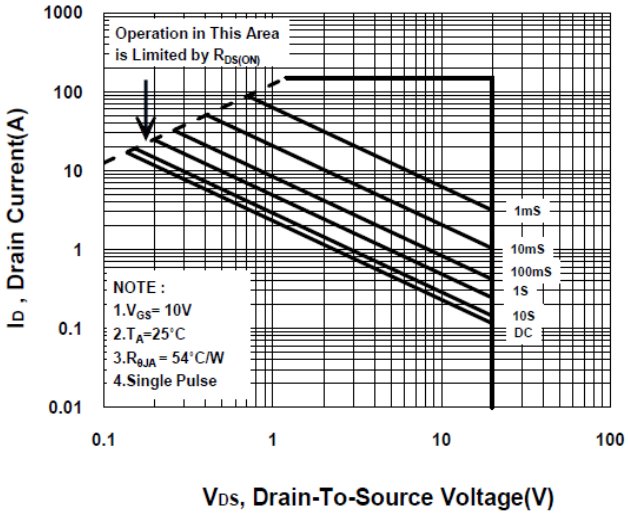
UNIKC Semiconductor

RoHS Compliant

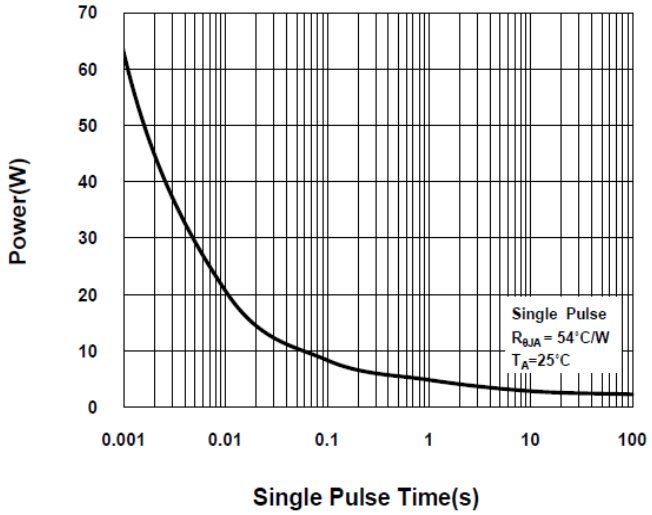
P0502CEA

N-Channel Enhancement Mode MOSFET

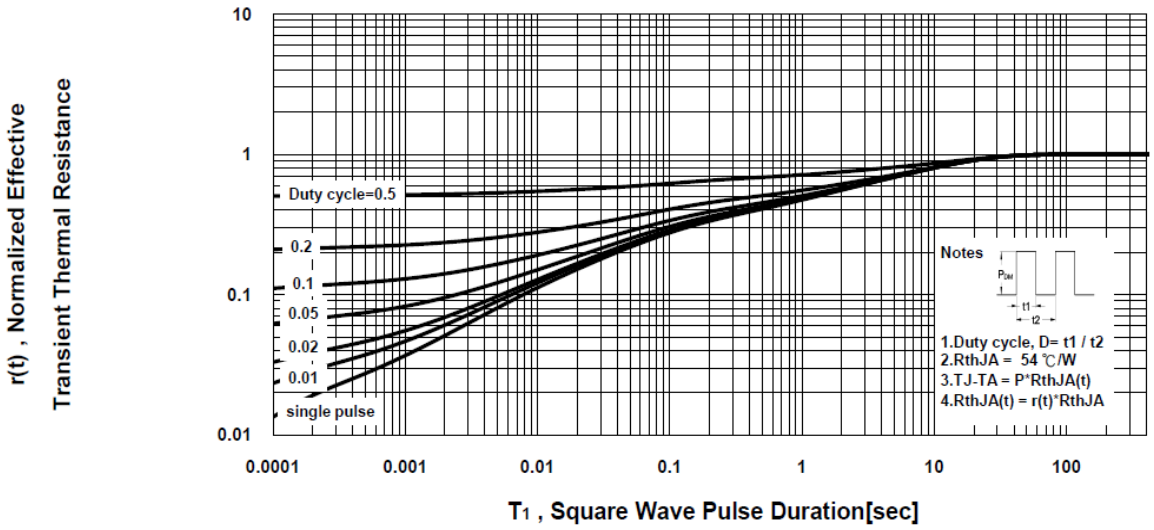
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



UNIKC Semiconductor

RoHS Compliant

P0502CEA

N-Channel Enhancement Mode MOSFET

Package Dimension

PDFN 3x3P MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	3		3.6	I	0.7		1.12
B	2.88		3.2	J	0.1		0.33
C	2.9		3.2	K	0.6		
D	1.98		2.69	L	0°	10°	12°
E	3		3.6	M	0.14		0.41
F	0		0.455	N	0.6		0.7
G	1.47		2.2	O	0.12		0.36
H	0.15		0.56	P	0		0.2