UNIKC Semiconductor

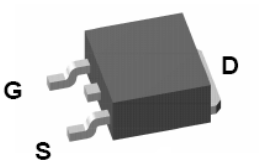
RoHS Compliant

P2003ED

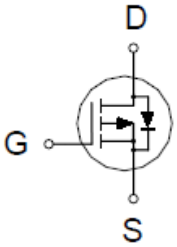
P-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-30V	20mΩ @V_{GS} = -10V	-36A



TO-252



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}	±25	
Continuous Drain Current	T_C = 25 °C	I_D	-36	A
	T_C = 100 °C		-23	
Pulsed Drain Current[1]		I_{DM}	-100	
Avalanche Current		I_{AS}	-32	
Avalanche Energy[2]	L = 0.1 mH	E_{AS}	51	mJ
Power Dissipation	T_C = 25 °C	P_D	42	W
	T_C = 100 °C		17	
Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

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

[1]Pulse width limited by maximum junction temperature.

[2]V_{DD} = -15V , Starting T_J = 25 °C.

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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	-30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.0	-1.6	-3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±25V			±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	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = -5V, V_{GS} = -10V	-100			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -12A		28	35	mΩ
		V_{GS} = -10V, I_D = -18A		17	20	
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -12A		26		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -15V, f = 1MHz		1600		pF
Output Capacitance	C_{oss}			362		
Reverse Transfer Capacitance	C_{rss}			266		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V , f = 1MHZ		3		Ω
Total Gate Charge[2]	Q_g(V_{GS} = 10V)	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = -10V, I_D = -18A		28		nC
	Q_g(V_{GS} = 4.5V)			12		
Gate-Source Charge[2]	Q_{gs}			7		
Gate-Drain Charge[2]	Q_{gd}			6		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -15V, I_D≅ -18A, V_{GS} = -10V, R_{GEN} = 6Ω		12		nS
Rise Time[2]	t_r			10		
Turn-Off Delay Time[2]	$t_{d(off)}$			36		
Fall Time[2]	t_f			19		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-32	A
Forward Voltage[1]	V_{SD}	I_F = -1A, V_{GS} = 0V			-1	V
Reverse Recovery Time	t_{rr}	I_F = -18A, dI_F/dt = 100A / μS		36		nS
Reverse Recovery Charge	Q_{rr}			32		nC

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

[2]Independent of operating temperature.

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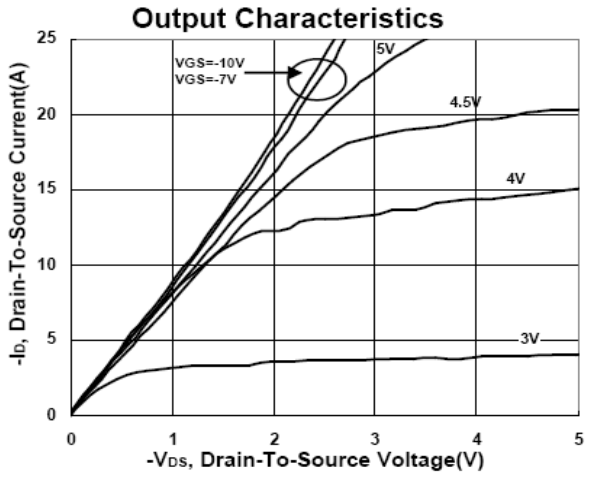

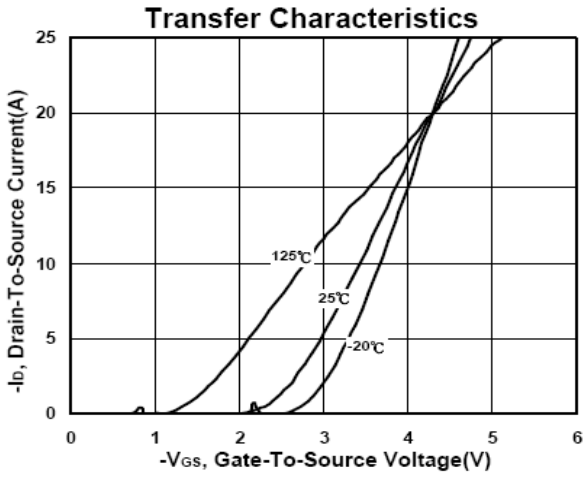

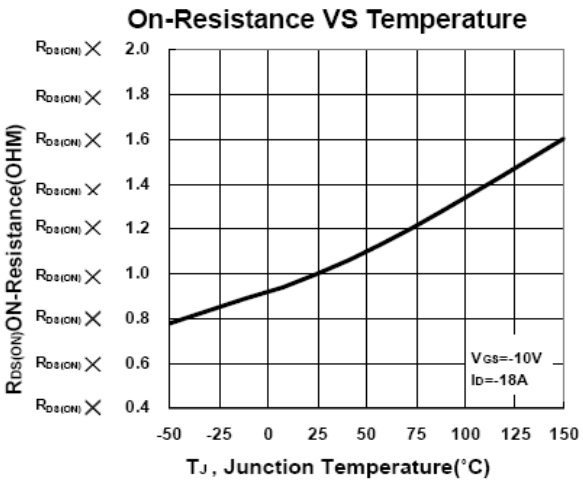

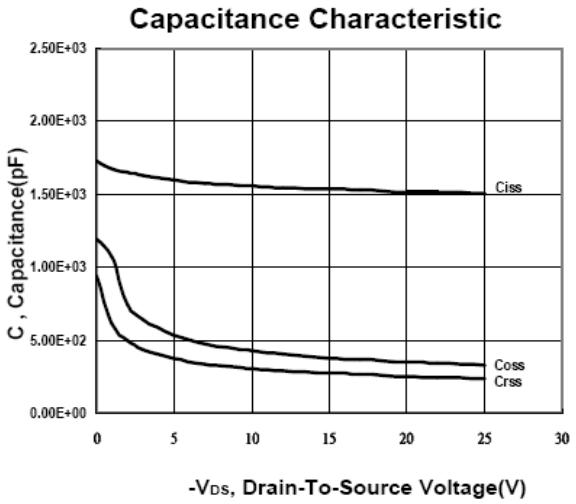

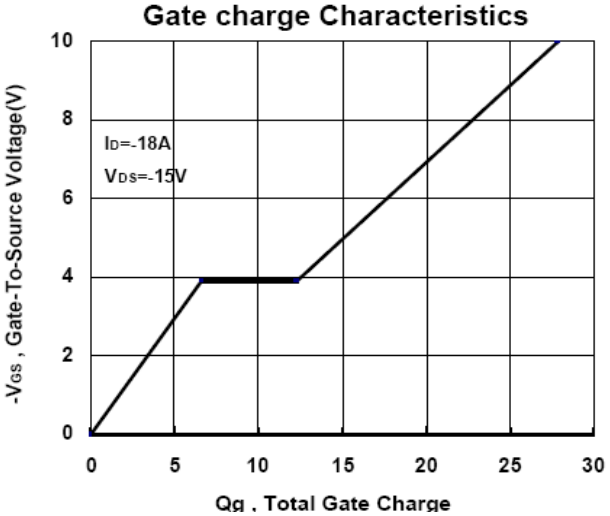

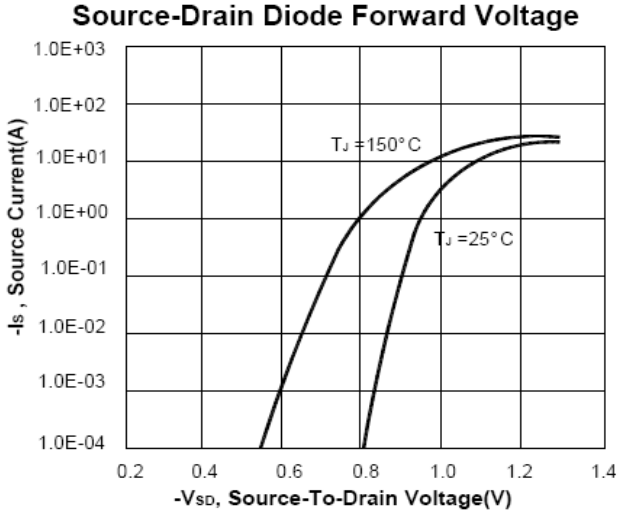

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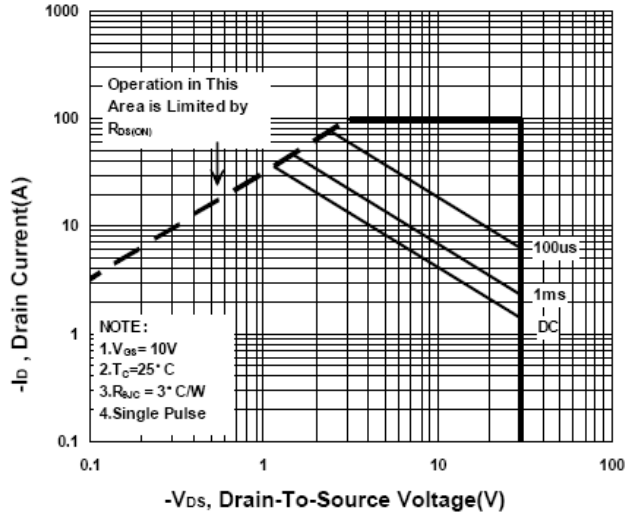
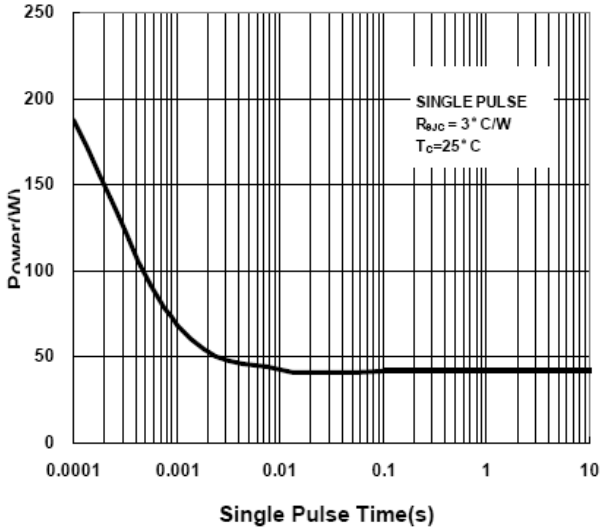
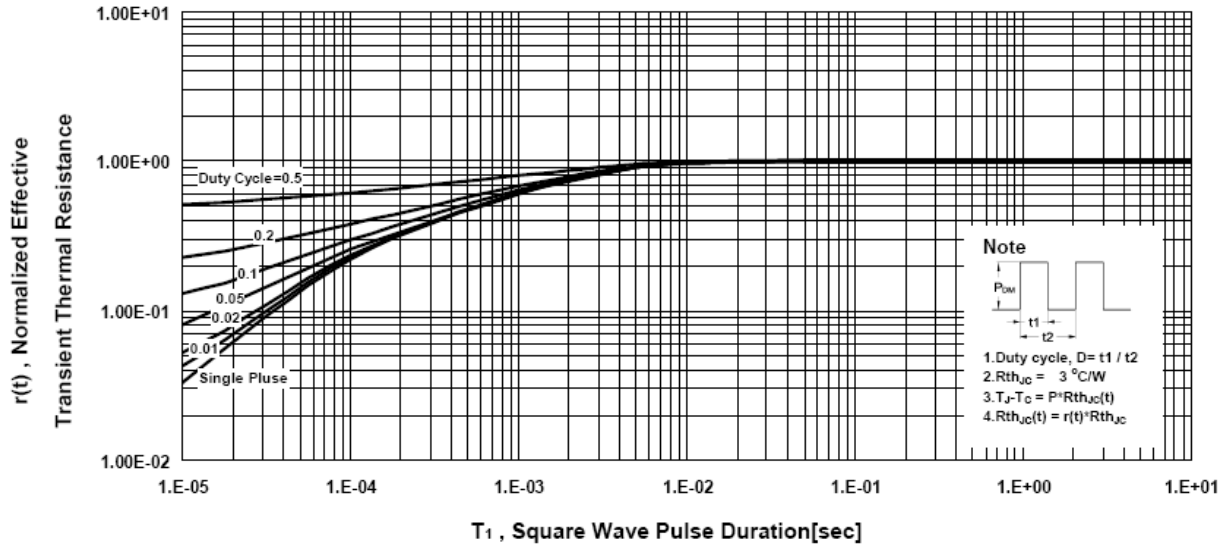
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

TO-252 (DPAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	8.9	10	10.41	J	4.8		5.64
B	2.1	2.2	2.5	K	0.15		1.49
C	0.4	0.5	0.61	L	0.4	0.76	0.91
D	0.82	1.2	1.5	M	4.2	4.58	5
E	0.35	0.5	0.65	S	4.57	5.1	5.52
F	0		0.2	T	3.81	4.75	5.24
G	5.3	6.1	6.3	U	1.4		1.78
H	0.5		1.7	V	0.55	1.25	1.7
I	6.3	6.5	6.8