UNIKC Semiconductor

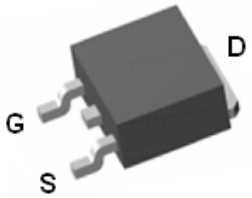
RoHS Compliant

P0804BD

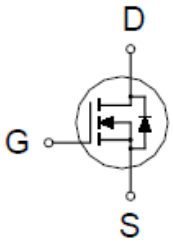
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	8.5mΩ @V_{GS} = 10V	50A



TO-252



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	40	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C = 25 °C	I_D	50	A
	T_C = 100 °C		35	
Pulsed Drain Current[1]		I_{DM}	100	
Power Dissipation	T_C = 25 °C	P_D	50	W
	T_C = 100 °C		30	
Operating Junction & Storage Temperature Range		T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		2.5	°C / W
Junction-to-Ambient	$R_{\theta JA}$		62.5	

[1]Pulse width limited by maximum junction temperature.

[2]Duty cycle≤1%

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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	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.5	2.0	3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 32V, V_{GS} = 0V			1	μA
		V_{DS} = 30V, V_{GS} = 0V , T_C = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	50			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 7V, I_D = 16A		11	15	mΩ
		V_{GS} = 10V, I_D = 20A		7	8.5	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 20A		25		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz		2100	2730	pF
Output Capacitance	C_{oss}			360	450	
Reverse Transfer Capacitance	C_{rss}			330	415	
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, V_{GS} = 10V, I_D = 20A		43		nC
Gate-Source Charge[2]	Q_{gs}			6.3		
Gate-Drain Charge[2]	Q_{gd}			5.5		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = 20V, R_L = 1Ω I_D ≅ 20A, V_{GS} = 10V, R_{GEN} = 6Ω		6.8	11.2	nS
Rise Time[2]	t_r			18	28.8	
Turn-Off Delay Time[2]	$t_{d(off)}$			26.5	42.5	
Fall Time[2]	t_f			8.7	15.8	
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				50	A
pulsed Current[3]	I_{SM}				100	
Forward Voltage[1]	V_{SD}	I_F = 20A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 20A, dI_F/dt = 100A / μS		75		nS
Reverse Recovery Charge	Q_{rr}			55		nC

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

[2]Independent of operating temperature.

[3] Pulse width limited by maximum junction temperature.

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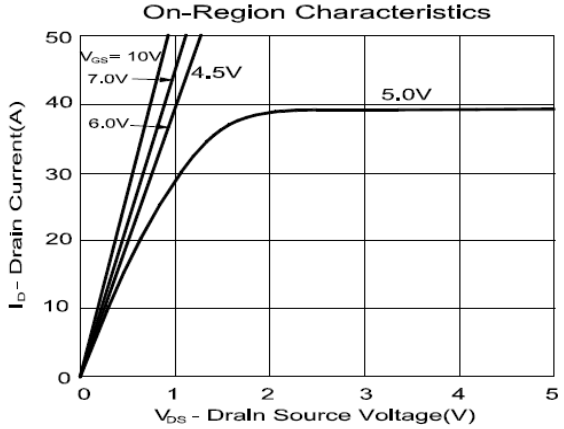
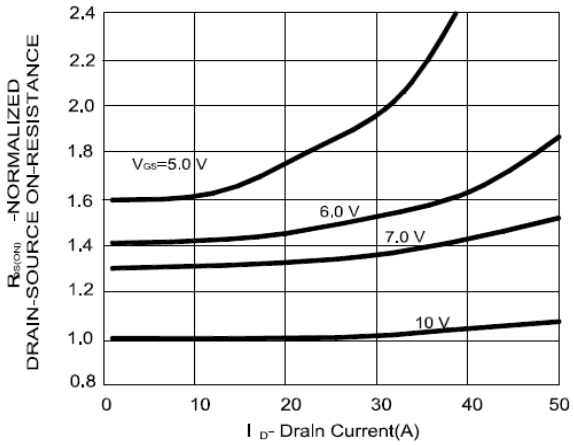
TYPICAL PERFORMANCE CHARACTERISTICS

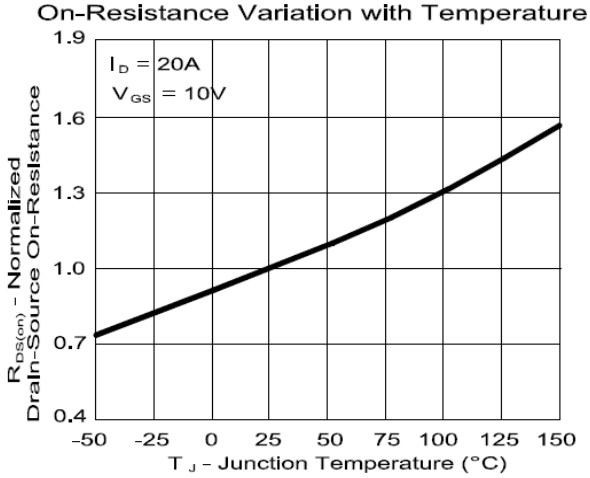
On-Region Characteristics



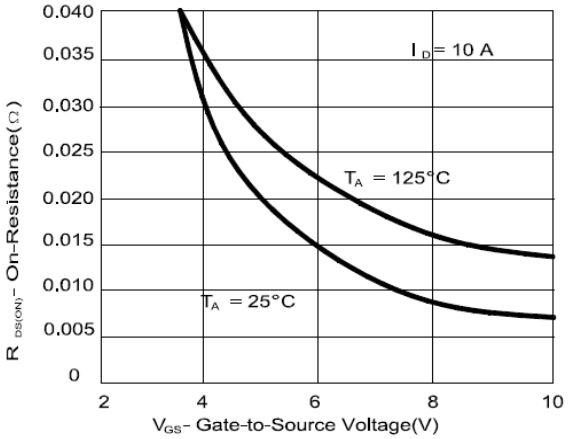
On-Resistance Variation with Drain Current and Gate Voltage



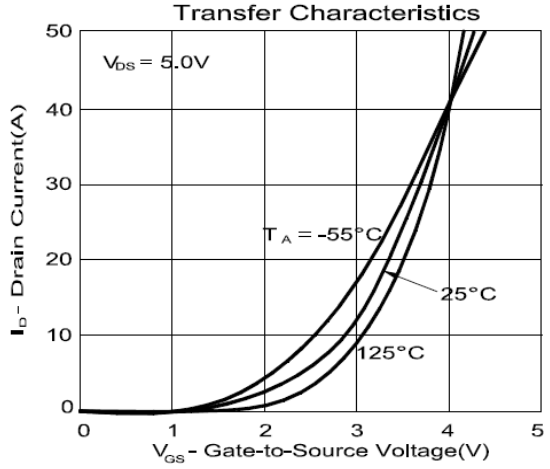
On-Resistance Variation with Temperature



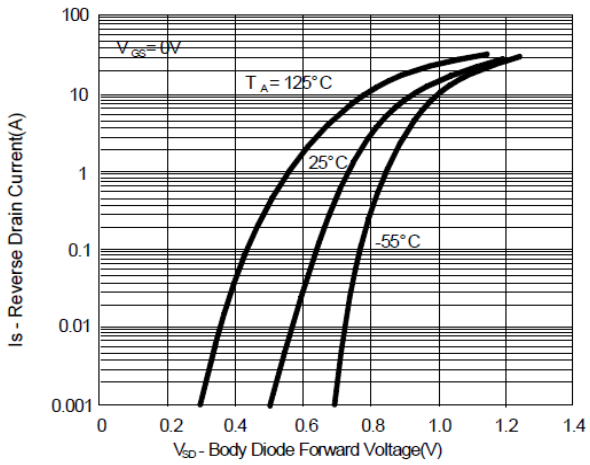
On-Resistance Variation with Gate-to-Source Voltage



Transfer Characteristics



Body Diode Forward Voltage Variation with Source Current and Temperatur



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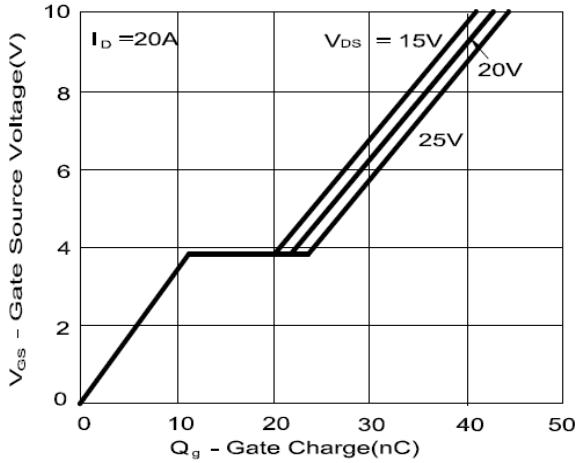
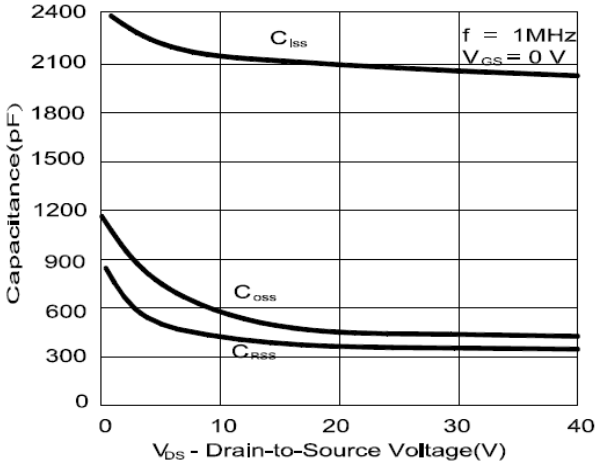
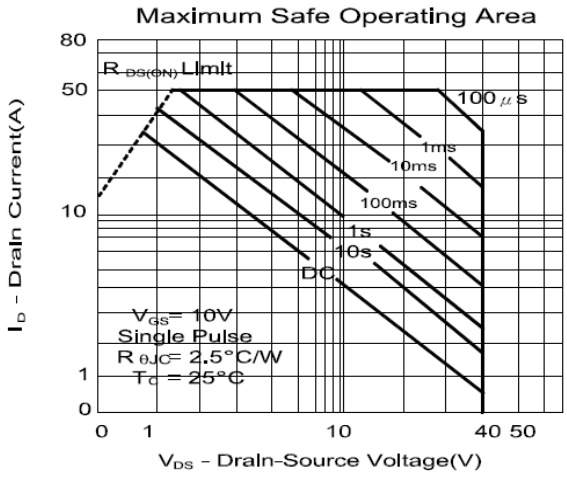
Gate Charge Characteristics



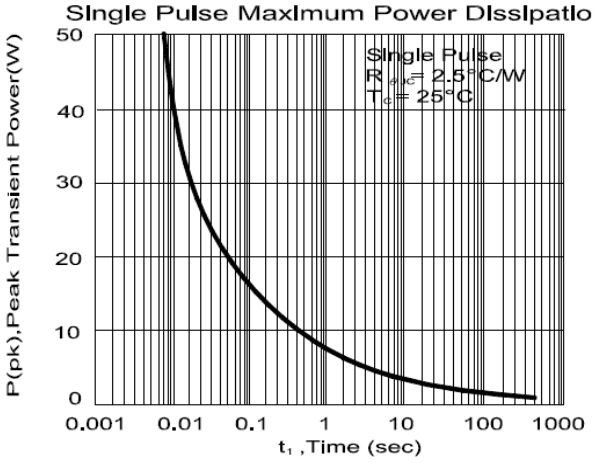
Capacitance Characteristics



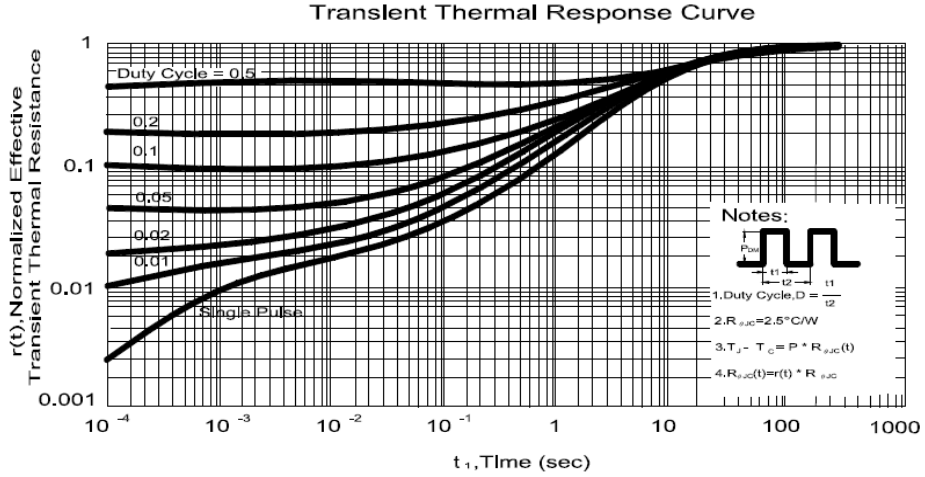
Maximum Safe Operating Area



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