UNIKC Semiconductor

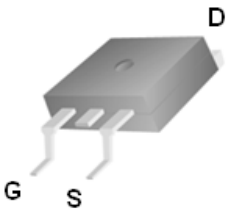
RoHS Compliant

P1004BS

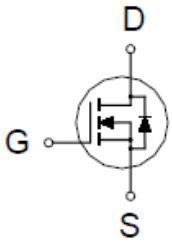
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
40V	11mΩ @V_{GS} = 10V	53A



TO-263



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current[2]	T_C = 25 °C	I_D	53	A
	T_C = 100 °C		34	
Pulsed Drain Current[1]		I_{DM}	159	
Avalanche Current		I_{AS}	40	
Avalanche Energy	L = 0.1mH	E_{AS}	82	mJ
Power Dissipation	T_C = 25 °C	P_D	63	W
	T_C = 100 °C		25	
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	°C / W

[1]Pulse width limited by maximum junction temperature.

[2]The maximum current rating in limited by bond-wires.

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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	40			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.5	1.7	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 32V, V_{GS} = 0V			1	μA
		V_{DS} = 30V, V_{GS} = 0V , T_J = 125 °C			10	
On-State Drain Current[1]	$I_{D(ON)}$	V_{DS} = 10V, V_{GS} = 10V	159			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 5V, I_D = 8A		13	21	mΩ
		V_{GS} = 10V, I_D = 15A		8	11	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 15A		26		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 20V, f = 1MHz		1500		pF
Output Capacitance	C_{oss}			271		
Reverse Transfer Capacitance	C_{rss}			196		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		1.9		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 20V, V_{GS} = 10V, I_D = 15A		34		nC
Gate-Source Charge[2]	Q_{gs}			6		
Gate-Drain Charge[2]	Q_{gd}			11		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 20V,I_D ≅ 15A, V_{GS} = 10V, R_{GEN} = 6Ω		6.4		nS
Rise Time[2]	t_r			17		
Turn-Off Delay Time[2]	$t_{d(off)}$			29		
Fall Time[2]	t_f			16		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				48	A
Forward Voltage[1]	V_{SD}	I_F = 15A, V_{GS} = 0V			1.3	V
Reverse Recovery Time	t_{rr}	I_F = 15A, dI_F/dt = 100A / μS		21		nS
Reverse Recovery Charge	Q_{rr}			13		nC

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

[2]Independent of operating temperature.

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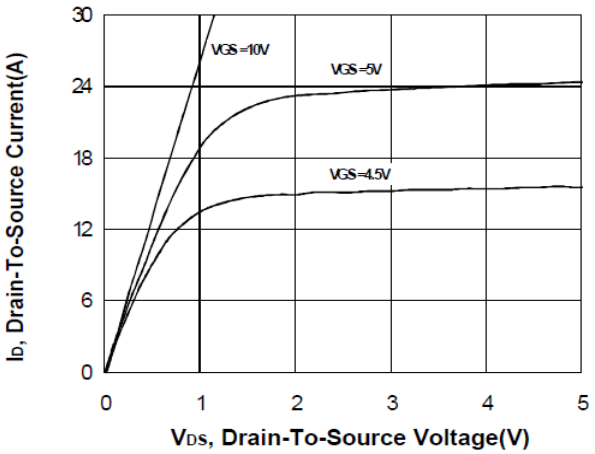
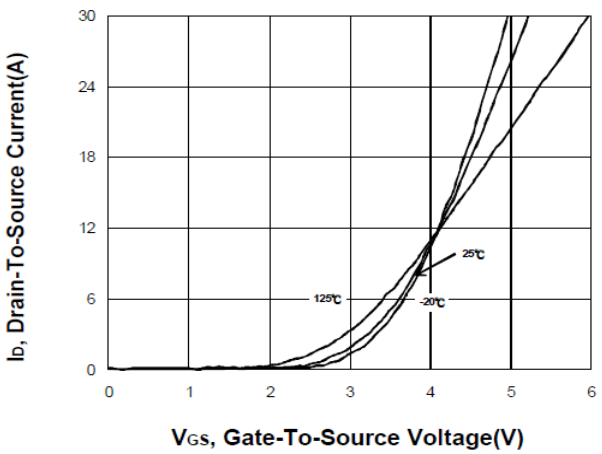
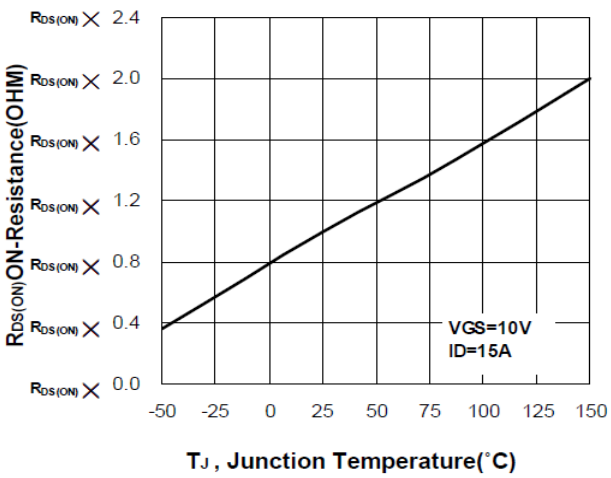
Output Characteristics



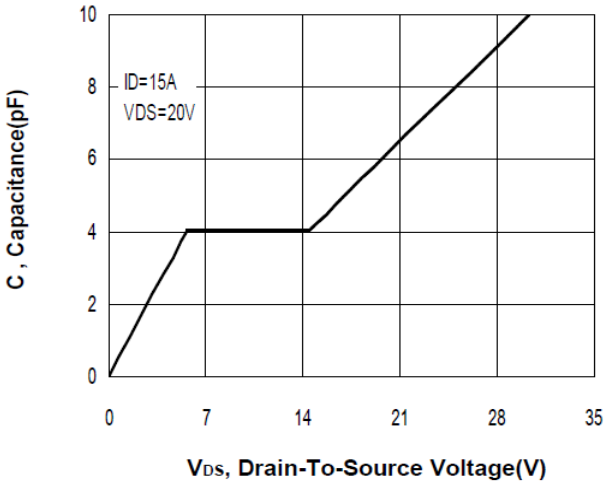
Transfer Characteristics



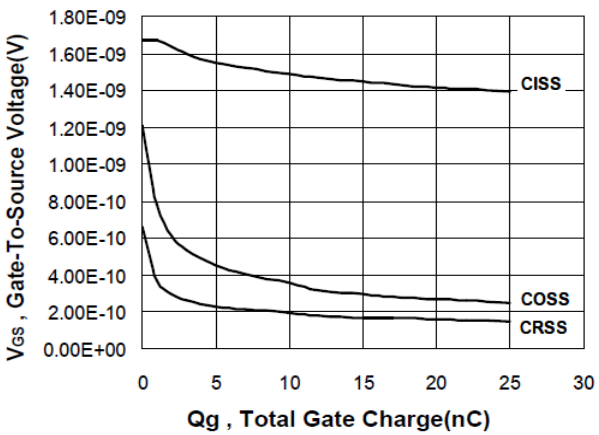
On-Resistance VS Temperature



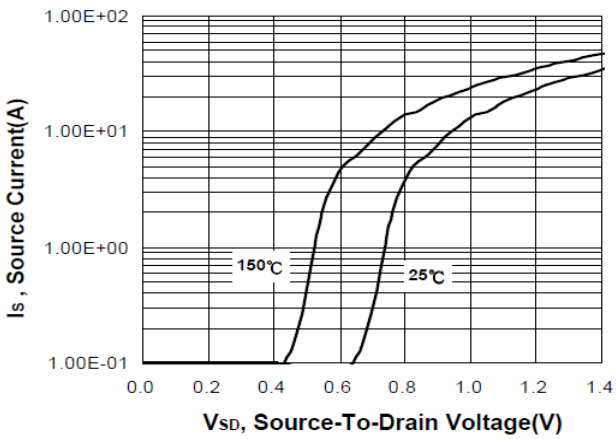
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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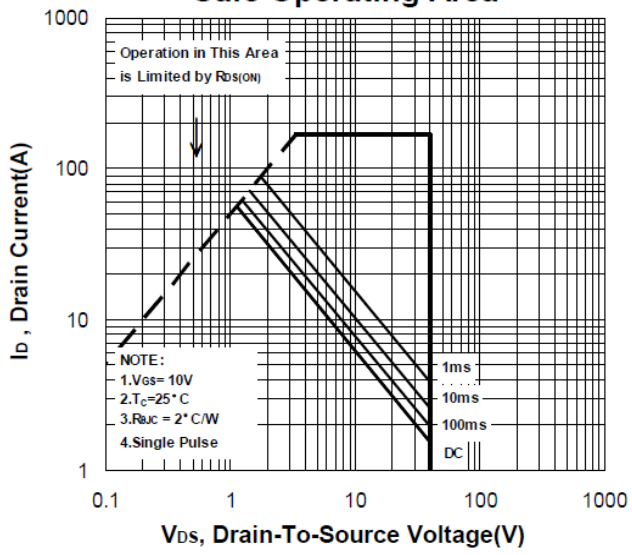
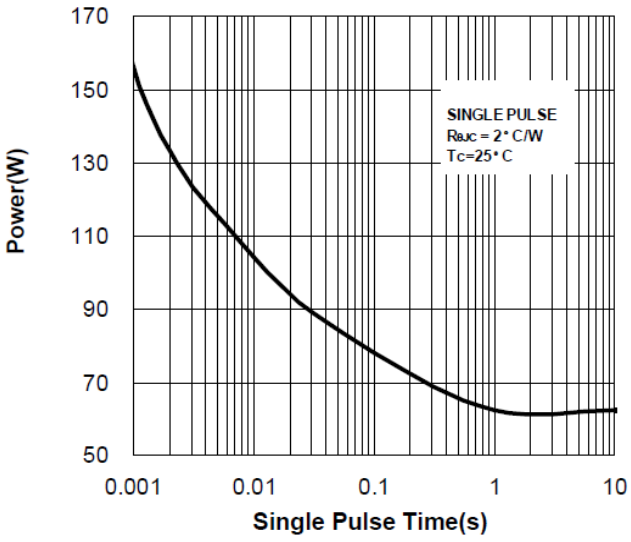
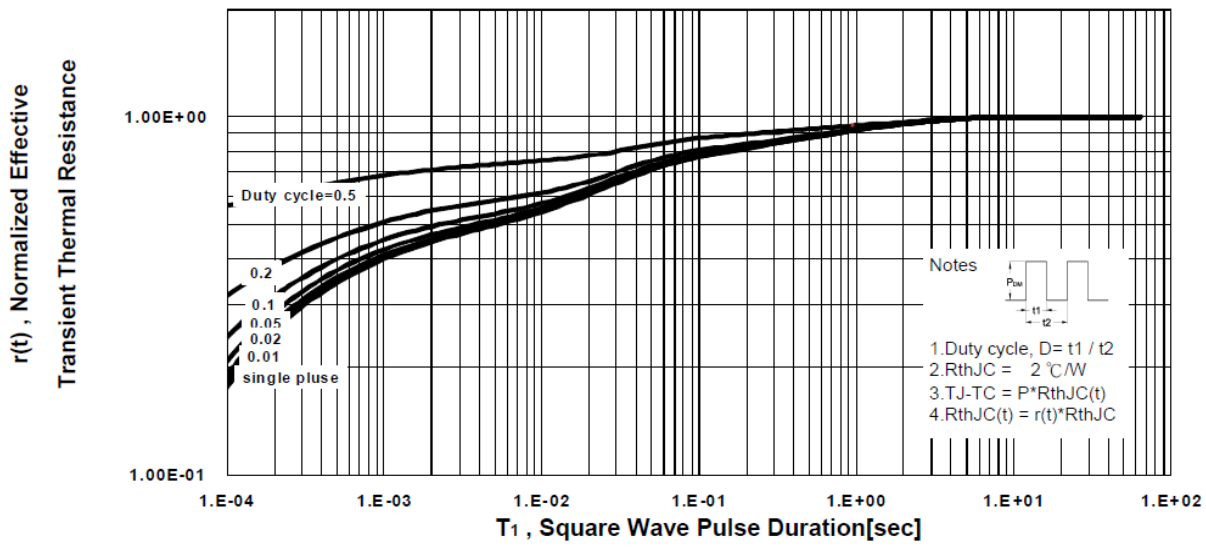
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

TO-263 (D^2PAK) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.2		4.8	e	4.08	5.08	6.08
A1	0		0.3	E	9.8		10.55
b	0.71		1.06	E1	6.9		8.7
b2	1.07		1.47	H	14.2		15.8
C	0.3		0.69	L	1.2		2.79
C2	1.15		1.45	L1	1		1.65
D	8.3		9.4	L2	1.2		1.78
D1	6.37		8.23