UNIKC
Semiconductor

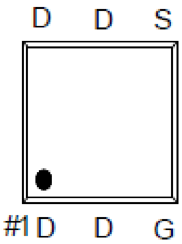
RoHS Compliant

P1603BEBB

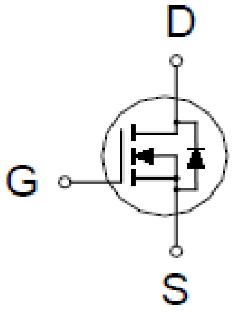
N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D[3]
30V	16mΩ @V_{GS} = 10V	24A



PDFN 2X2S



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}	±20	
Continuous Drain Current[3]	T_C = 25 °C	I_D	24	A
	T_C = 100 °C		15	
	T_A = 25 °C		8.2	
	T_A= 70 °C		6.6	
Pulsed Drain Current[1]		I_{DM}	70	
Avalanche Current		I_{AS}	20.5	
Avalanche Energy	L = 0.1 mH	E_{AS}	21	mJ
Power Dissipation	T_C = 25 °C	P_D	15	W
	T_C = 100 °C		6.2	
	T_A= 25 °C		1.8	
	T_A= 70°C		1.1	
Operating Junction & Storage Temperature Range		T_j, T_{stg}	-55 to 150	°C

THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient[2]	$R_{\theta JA}$		67	°C / W
Junction-to-Case	$R_{\theta JC}$		8	

[1] Pulse width limited by maximum junction temperature.

[2] The value of $R_{\theta JA}$ is measured with the device mounted on $1in^2$ FR-4 board with 2oz. Coppe.

[3] Package limitation current is 18A.

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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	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1	1.4	2.5	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 24V, V_{GS} = 0V$			1	µA
		$V_{DS} = 20V, V_{GS} = 0V, T_J = 125°C$			10	
On-State Drain Current[1]	$I_{D(ON)}$	$V_{DS} = 5V, V_{GS} = 10V$	70			A
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	$V_{GS} = 4.5V, I_D = 6.8A$		16.2	25	mΩ
		$V_{GS} = 10V, I_D = 8A$		13.4	16	
Forward Transconductance[1]	g_{fs}	$V_{DS} = 10V, I_D = 8A$		30		S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{GS} = 0V, V_{DS} = 15V, f = 1MHz$		516		pF
Output Capacitance	C_{oss}			86		
Reverse Transfer Capacitance	C_{rss}			67		
Gate Resistance	R_g	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		2.6		Ω
Total Gate Charge[2]	$Q_{g(VGS=10V)}$	$V_{DS} = 15V, I_D = 8A$		13.4		nC
	$Q_{g(VGS=4.5V)}$			7.4		
Gate-Source Charge[2]	Q_{gs}			1.6		
Gate-Drain Charge[2]	Q_{gd}			3.3		
Turn-On Delay Time[2]	$t_{d(on)}$	$V_{DD} = 15V$ $I_D \cong 8A, V_{GEN} = 10V, R_G = 6\Omega$		12		nS
Rise Time[2]	t_r			10		
Turn-Off Delay Time[2]	$t_{d(off)}$			27		
Fall Time[2]	t_f			10		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current[3]	I_S				24	A
Forward Voltage[1]	V_{SD}	$I_F = 8A, V_{GS} = 0V$			1	V
Reverse Recovery Time	t_{rr}	$I_F = 8A, dI_F/dt = 100A / \mu S$		11.4		nS
Reverse Recovery Charge	Q_{rr}			2.7		nC

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

[2] Independent of operating temperature.

[3] Package limitation current is 18A.

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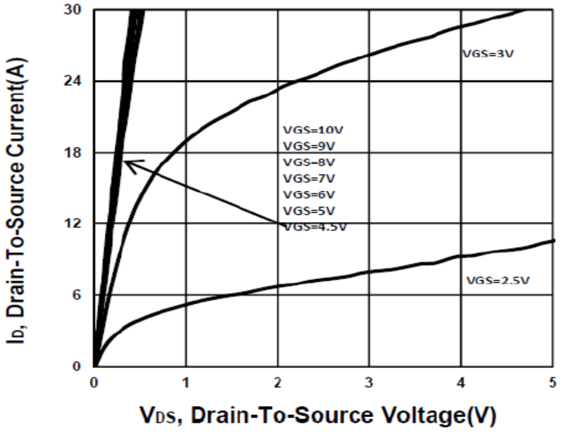
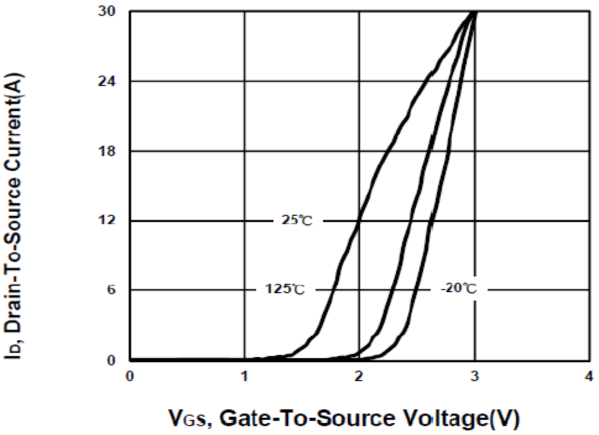
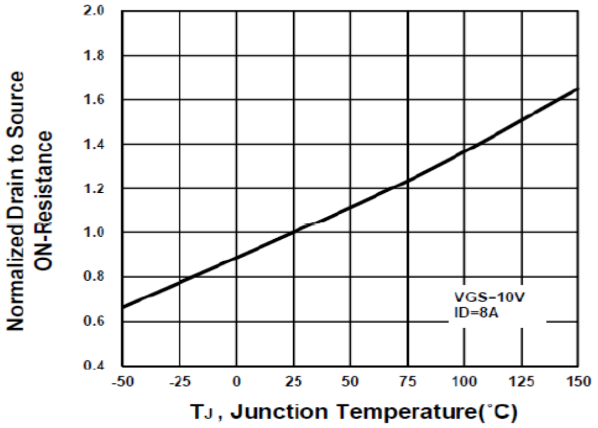
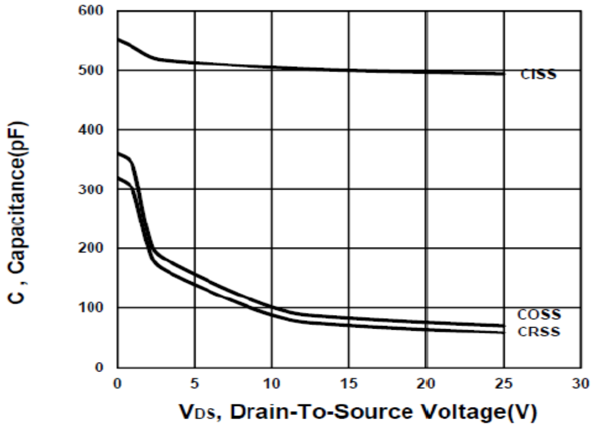
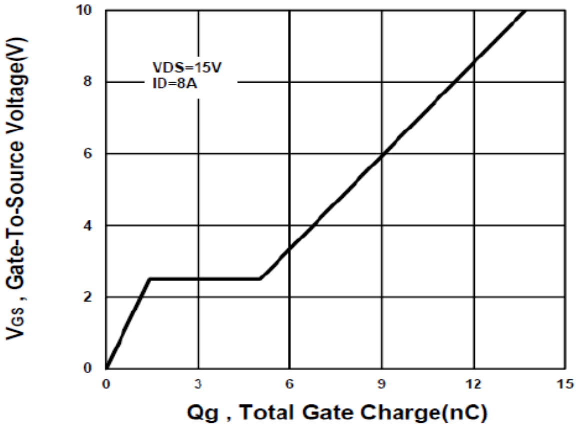
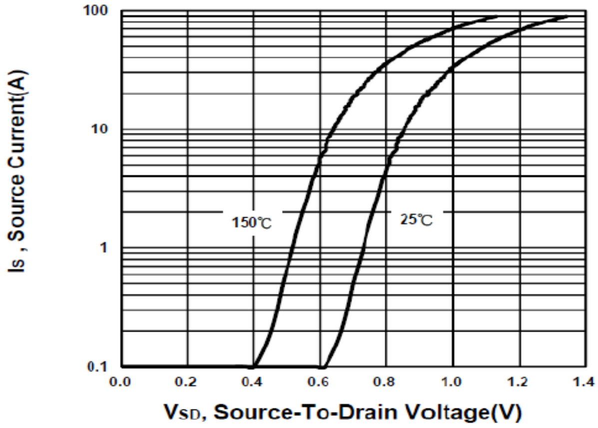

Output Characteristics


Transfer Characteristics


On-Resistance VS Temperature


Capacitance Characteristic


Gate charge Characteristics


Source-Drain Diode Forward Voltage

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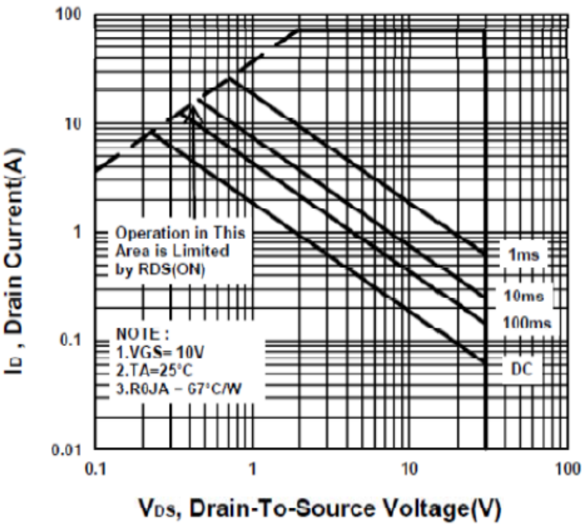
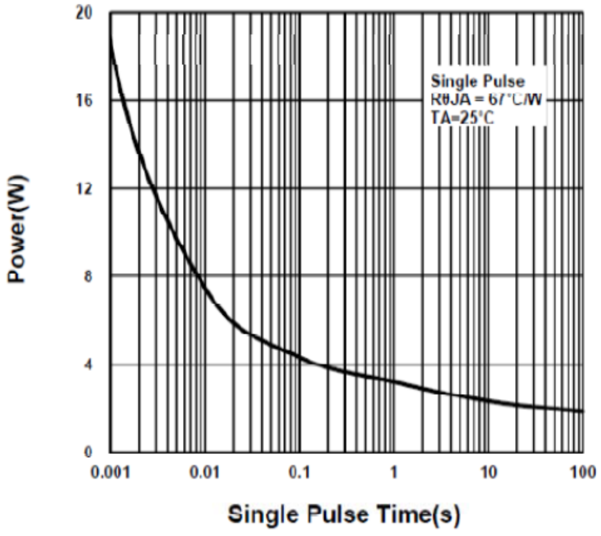
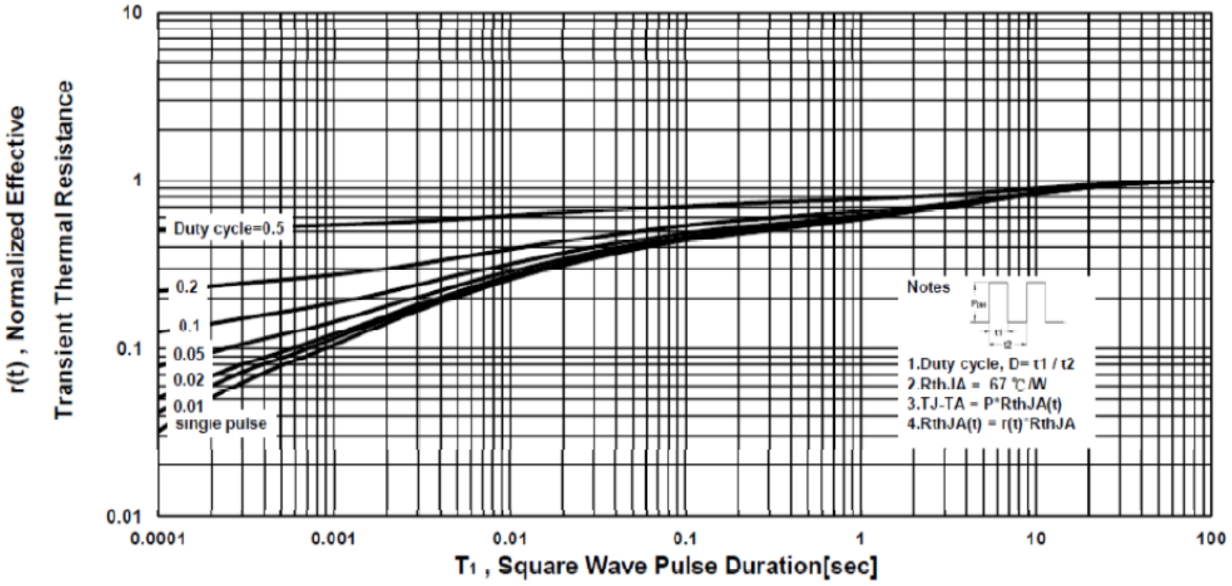
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

PDFN 2x2S MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	1.9		2.1	I	0		0.05
B	1.9		2.1	J		0.203	
C	0.55	0.65	0.75	K	0.55		0.8
D	0.85		1.25	L	0.2		0.4
E	0.174	0.25	0.326	M	0.46		0.85
F	0.25		0.35	N		0.15	
G		0.2		O		0.23	
H	0.8		1.15