UNIKC Semiconductor

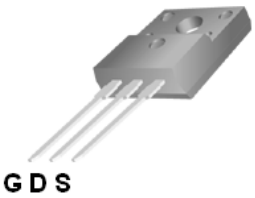
RoHS Compliant

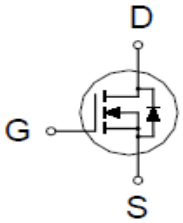
P5015BTF

N-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
150V	50mΩ @V_{GS} = 10V	18A





TO-220F

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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_c = 25 °C	I_D	18	A
	T_c = 100 °C		11	
Pulsed Drain Current[1]		I_{DM}	80	
Avalanche Current		I_{AS}	20	
Avalanche Energy	L = 0.1mH	E_{AS}	20	mJ
Power Dissipation	T_C = 25 °C	P_D	41	W
	T_C = 100 °C		16	
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.

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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	150			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1	2	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120V, V_{GS} = 0V			1	μA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 125 ° C			10	
Drain-Source On-State Resistance[1]	$R_{DS(ON)}$	V_{GS} = 4.5V, I_D = 4A		44	90	mΩ
		V_{GS} = 10V , I_D = 18A		37	50	
Forward Transconductance[1]	g_{fs}	V_{DS} = 10V, I_D = 18A		30		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz		4607		pF
Output Capacitance	C_{oss}			182		
Reverse Transfer Capacitance	C_{rss}			130		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		2.5		Ω
Total Gate Charge[2]	Q_g(V_{GS}=10V)	V_{DS} = 75V,I_D = 18A		88		nC
	Q_g(V_{GS}=4.5V)			43		
Gate-Source Charge[2]	Q_{gs}			15		
Gate-Drain Charge[2]	Q_{gd}			25		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DD} = 75V , I_D ≅ 18A, V_{GS} = 10V, R_{GS} =6Ω		40		nS
Rise Time[2]	t_r			230		
Turn-Off Delay Time[2]	$t_{d(off)}$			180		
Fall Time[2]	t_f			216		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				18	A
Forward Voltage[1]	V_{SD}	I_F = 18A, V_{GS} = 0V			1.4	V
Reverse Recovery Time	t_{rr}	I_F=18A,dI_F/dt = 100A / μS		71		nS
Reverse Recovery Charge	Q_{rr}			223		nC

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

[2]Independent of operating temperature.

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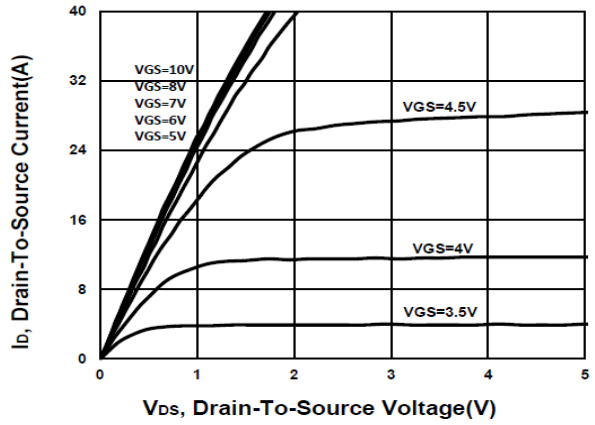
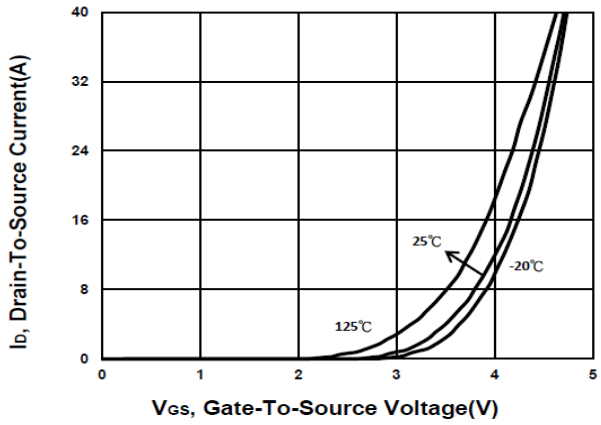
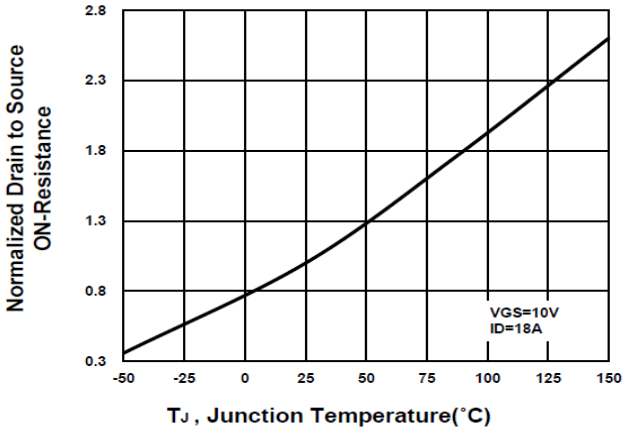
Output Characteristics



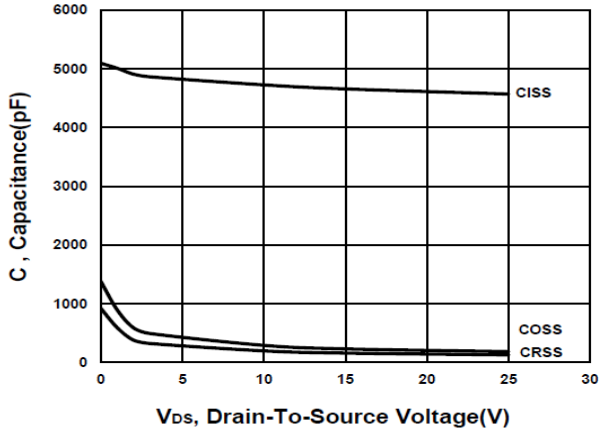
Transfer Characteristics



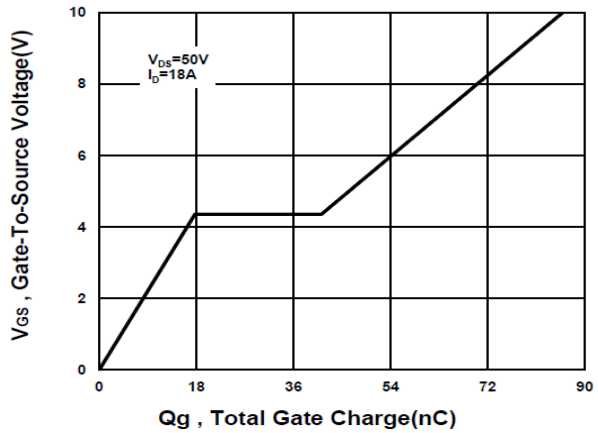
On-Resistance VS Temperature



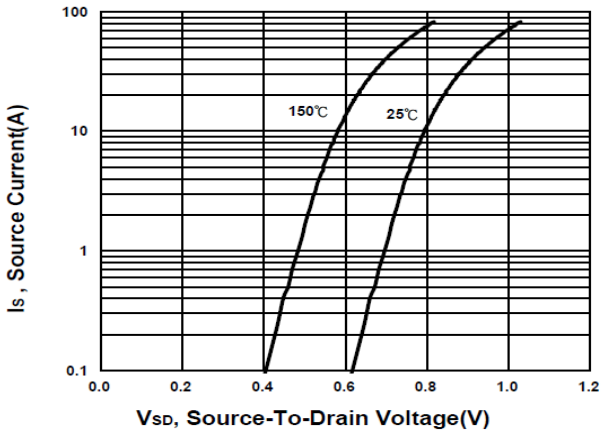
Capacitance Characteristic



Gate charge Characteristics



Source-Drain Diode Forward Voltage



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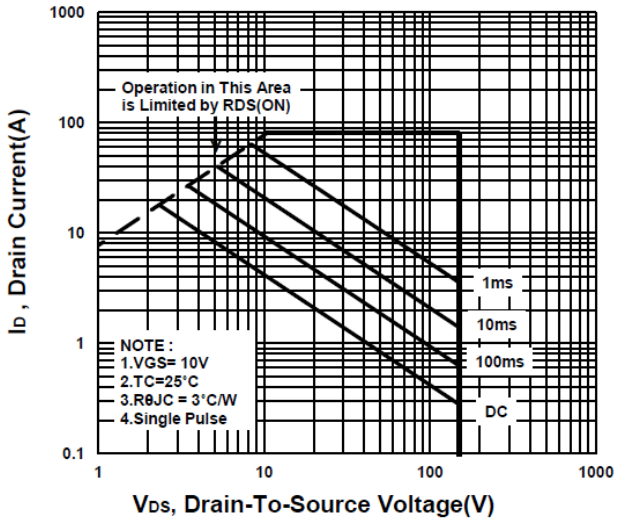
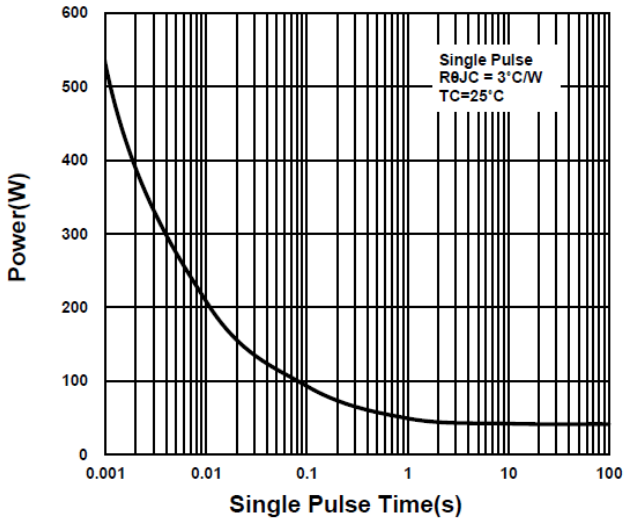
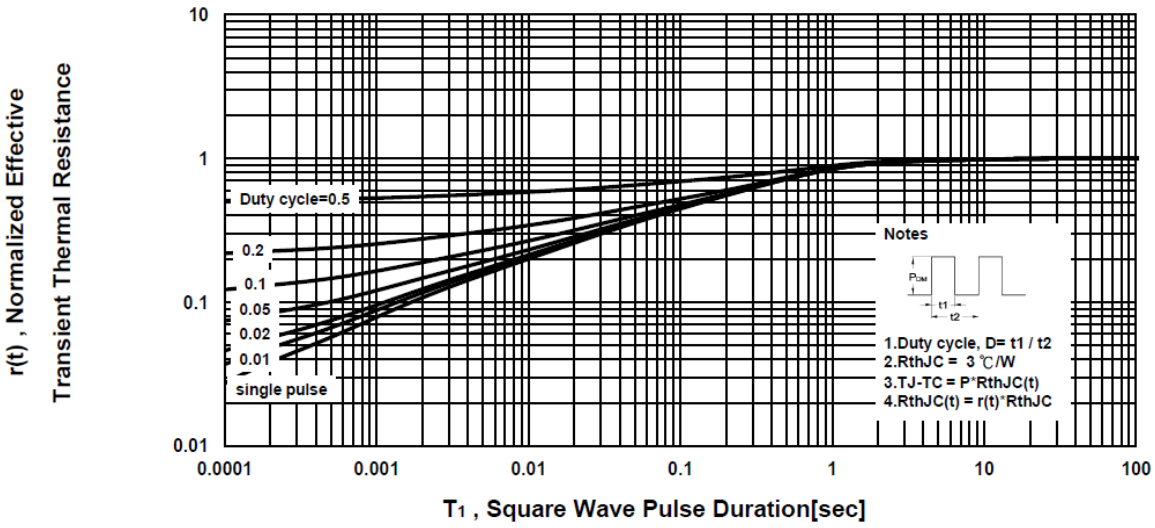
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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Package Dimension

TO-220F (3-Lead) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	4.2		4.93	e	2.05	2.55	3.05
A1	2.34		3.1	F	27.45		30.6
B	17.77		20.3	G	7.72		9.3
b	0.6		1.05	H	6.1		7.1
b1	0.9	1.23	1.62	L	12.5		14.5
b2	0.6		1.9	L1	1.97		3.8
c	0.4		1.0	P	2.98		3.4
D	14.7		16.4	Q	2.1		2.96
D1	6.4		7.5	q	3.0		3.8
E	9.7		10.4