UNIKC Semiconductor

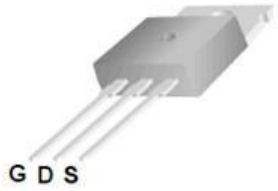
RoHS Compliant

P6010DTG

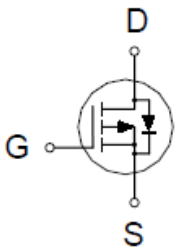
P-Channel Enhancement Mode MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	I_D
-100V	60mΩ @V_{GS} = -10V	-27A



TO-220



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

PARAMETERS/TEST CONDITIONS		SYMBOL	LIMITS	UNITS
Drain-Source Voltage		V_{DS}	-100	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current	T_C = 25 °C	I_D	-27	A
	T_C = 100 °C		-17	
Pulsed Drain Current[1]		I_{DM}	-100	
Avalanche Current		I_{AS}	-54	
Avalanche Energy	L = 0.1mH	E_{AS}	143	mJ
Power Dissipation	T_C = 25 °C	P_D	83	W
	T_C = 100 °C		33	
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	$R_{\theta JC}$		1.5	°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	-100			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-1.5	-2.6	-4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -80V, V_{GS} = 0V			-1	μA
		V_{DS} = -80V, V_{GS} = 0V , T_J = 125 °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} = -10V, I_D = -20A		52	60	mΩ
Forward Transconductance[1]	g_{fs}	V_{DS} = -5V, I_D = -20A		35		S
DYNAMIC						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -25V, f = 1MHz		5450		pF
Output Capacitance	C_{oss}			320		
Reverse Transfer Capacitance	C_{rss}			205		
Gate Resistance	R_g	V_{GS} = 0V, V_{DS} = 0V, f = 1MHz		4.6		Ω
Total Gate Charge[2]	Q_g	V_{DS} = 0.5$V_{(BR)DSS}$, I_D = -20A, V_{GS} = -10V		89		nC
Gate-Source Charge[2]	Q_{gs}			26		
Gate-Drain Charge[2]	Q_{gd}			24		
Turn-On Delay Time[2]	$t_{d(on)}$	V_{DS} = -50V, I_D ≅ -20A, V_{GS} = -10V, R_{GS} = 2.5Ω		18		nS
Rise Time[2]	t_r			87		
Turn-Off Delay Time[2]	$t_{d(off)}$			80		
Fall Time[2]	t_f			82		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T_J = 25 °C)						
Continuous Current	I_S				-27	A
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		126		nS
Reverse Recovery Charge	Q_{rr}			0.78		μC

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

[2]Independent of operating temperature.

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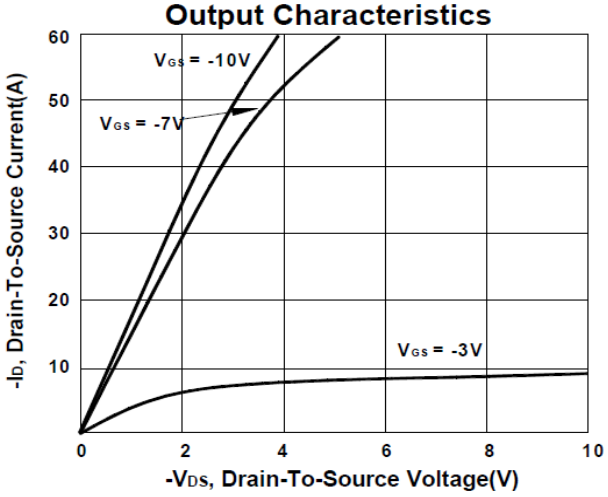
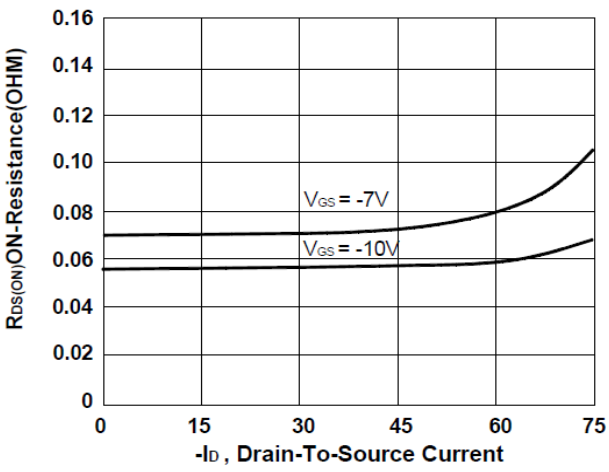
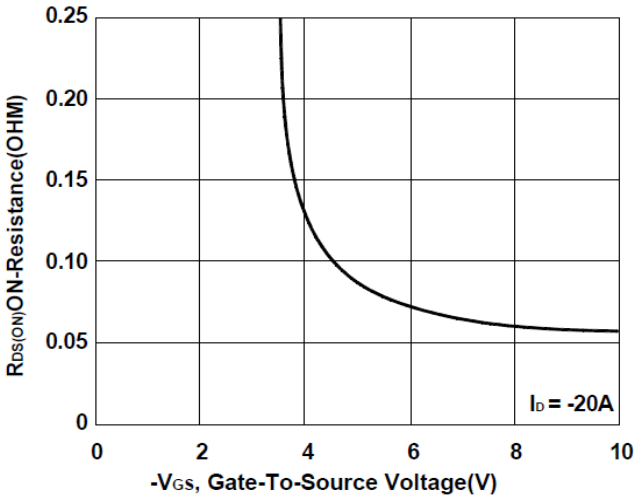
Output Characteristics



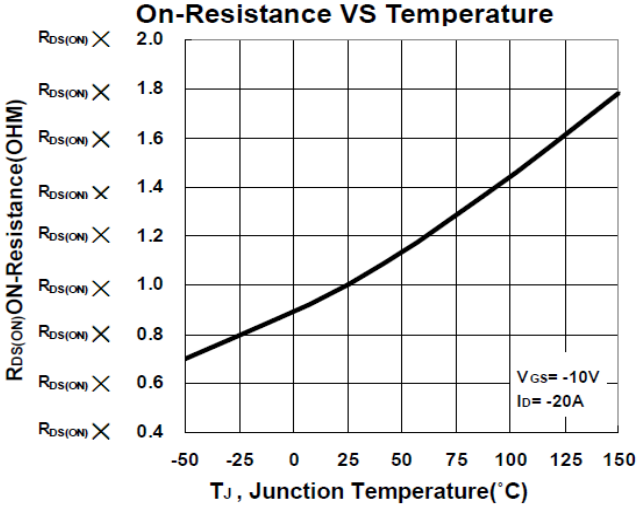
On-Resistance VS Drain Current



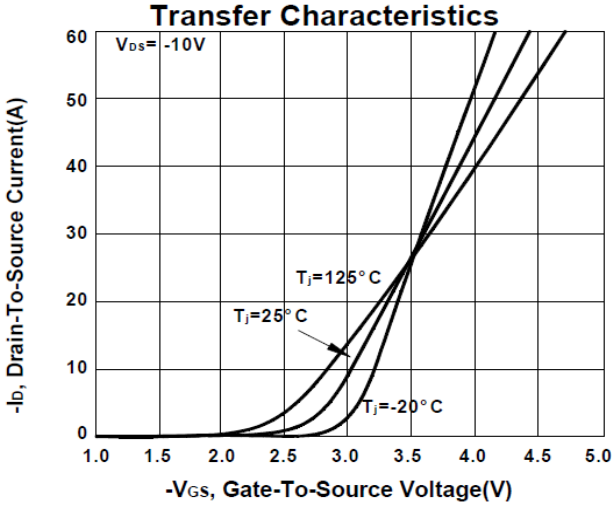
On-Resistance VS Gate-To-Source



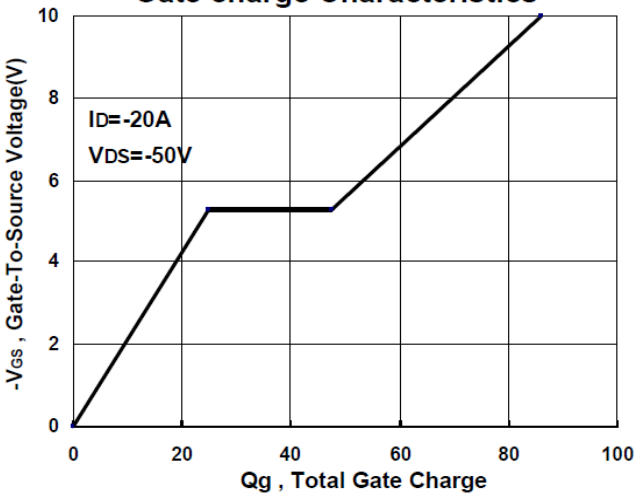
On-Resistance VS Temperature



Transfer Characteristics



Gate charge Characteristics



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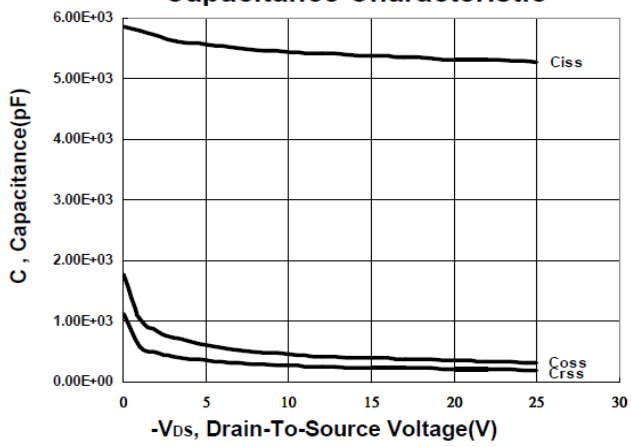
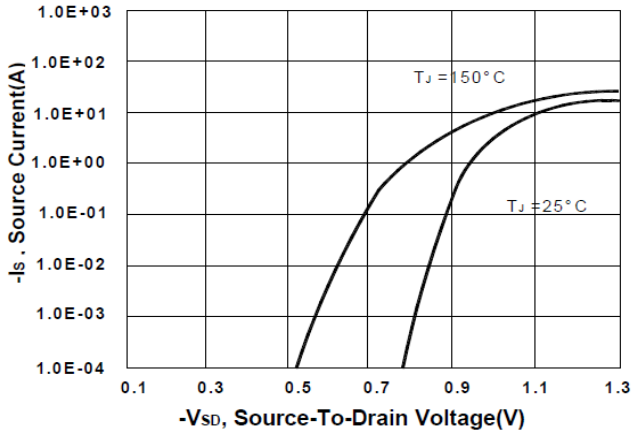
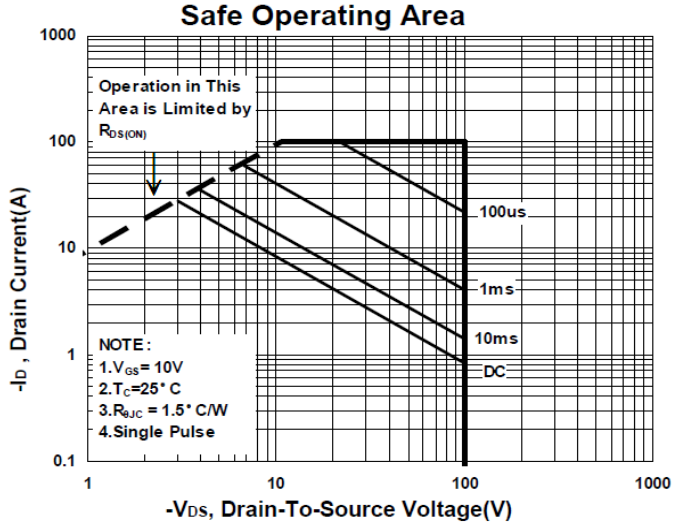
Capacitance Characteristic



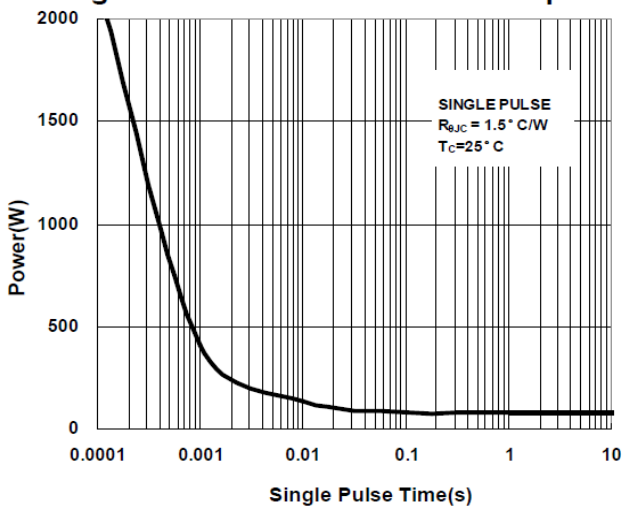
Body Diode Forward Voltage VS Source current



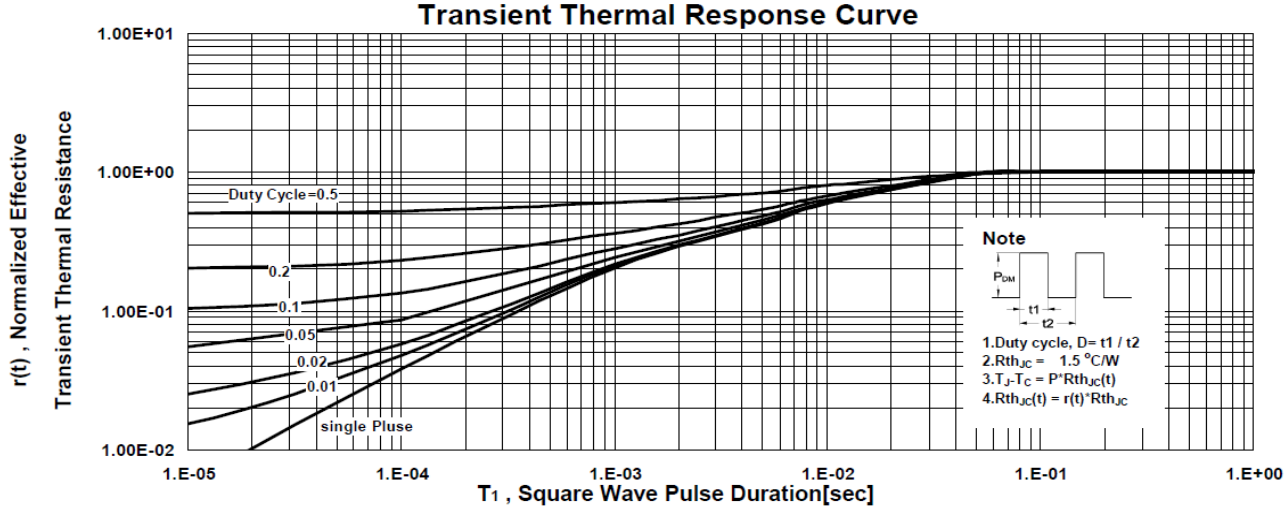
Safe Operating Area



Single Pulse Maximum Power Dissipation



Transient Thermal Response Curve



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TO-220 (3-Lead) MECHANICAL DATA

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	9.8	11.5		H	2.04	2.54	3.04
B	2.59	2.79	2.99	I	1.17	1.27	1.47
C	19.05	19.35	19.65	J	4.24	4.44	4.8
D	27.67	29	29.8	K	1.11	1.26	1.45
E	14.7	15	15.75	L	2.59		2.8
F	8.4	8.6	9.25	M	0.34	0.5	0.6
G	0.66	0.76	1.0	N