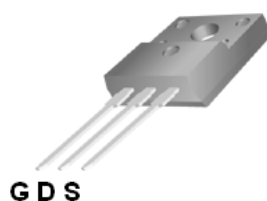


# P6010DTFG

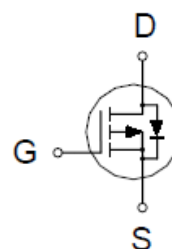
## P-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
-100V	60mΩ @ $V_{GS} = -10V$	-24A



TO-220F



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ }^{\circ}\text{C}$ 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	$T_C = 25\text{ }^{\circ}\text{C}$	$I_D$	-24	A
	$T_C = 100\text{ }^{\circ}\text{C}$		-15	
Pulsed Drain Current <sup>1,2</sup>		$I_{DM}$	-96	
Avalanche Current		$I_{AS}$	-52	
Avalanche Energy	$L = 0.1\text{mH}$	$E_{AS}$	139	mJ
Power Dissipation	$T_C = 25\text{ }^{\circ}\text{C}$	$P_D$	62	W
	$T_C = 100\text{ }^{\circ}\text{C}$		15	
Operating Junction & Storage Temperature Range		$T_J, T_{STG}$	-55 to 150	$^{\circ}\text{C}$

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Case	$R_{\theta JC}$		2	$^{\circ}\text{C} / \text{W}$

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>Limited by package.

# P6010DTFG

## P-Channel Enhancement Mode MOSFET

### ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)

PARAMETER	SYMBOL	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP	MAX	
STATIC						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-1.5	-2.6	-4.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			$\pm 250$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -80V, V_{GS} = 0V$			-1	$\mu A$
		$V_{DS} = -80V, V_{GS} = 0V, T_J = 125^\circ C$			-10	
On-State Drain Current <sup>1</sup>	$I_{D(ON)}$	$V_{DS} = -5V, V_{GS} = -10V$	-96			A
Drain-Source On-State Resistance <sup>1</sup>	$R_{DS(ON)}$	$V_{GS} = -10V, I_D = -20A$		50	60	mΩ
Forward Transconductance <sup>1</sup>	$g_{fs}$	$V_{DS} = -15V, I_D = -20A$		30		S
DYNAMIC						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = -25V, f = 1MHz$		5180		pF
Output Capacitance	$C_{oss}$			324		
Reverse Transfer Capacitance	$C_{rss}$			207		
Gate Resistance	$R_g$	$V_{GS} = 0V, V_{DS} = 0V, f = 1MHz$		4.9		Ω
Total Gate Charge <sup>2</sup>	$Q_g$	$V_{DS} = 0.5V_{(BR)DSS},$ $I_D = -20A, V_{GS} = -10V$		98		nC
Gate-Source Charge <sup>2</sup>	$Q_{gs}$			18		
Gate-Drain Charge <sup>2</sup>	$Q_{gd}$			24		
Turn-On Delay Time <sup>2</sup>	$t_{d(on)}$	$V_{DS} = -50V, I_D \cong -20A,$ $V_{GS} = -10V, R_{GS} = 2.5\Omega$		18		nS
Rise Time <sup>2</sup>	$t_r$			88		
Turn-Off Delay Time <sup>2</sup>	$t_{d(off)}$			85		
Fall Time <sup>2</sup>	$t_f$			81		
SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS ( $T_J = 25^\circ C$ )						
Continuous Current	$I_S$				-24	A
Forward Voltage <sup>1</sup>	$V_{SD}$	$I_F = -20A, V_{GS} = 0V$			-1.3	V
Reverse Recovery Time	$t_{rr}$	$I_F = -20A, dl_F/dt = 100A / \mu S$		65		nS
Reverse Recovery Charge	$Q_{rr}$			178		nC

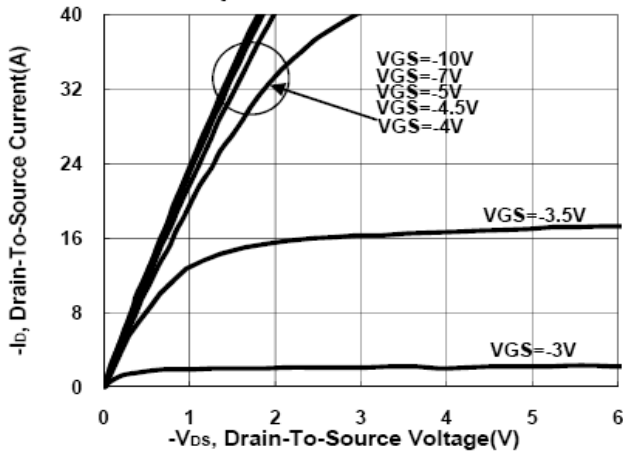
<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

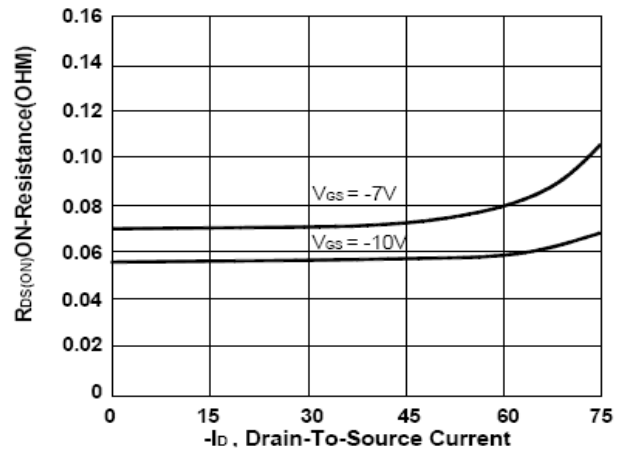
## P6010DTFG

### P-Channel Enhancement Mode MOSFET

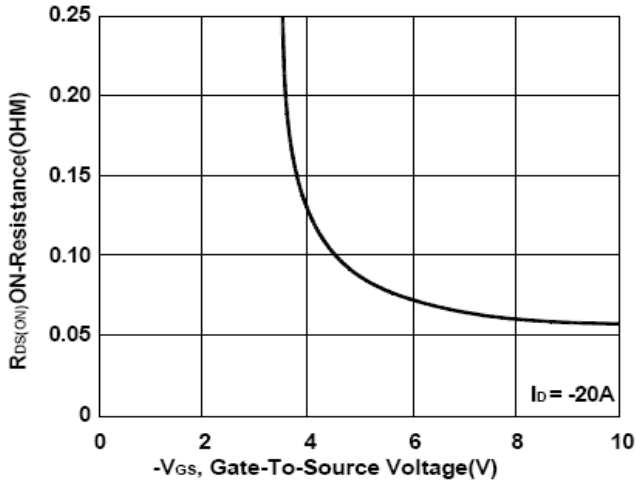
**Output Characteristics**



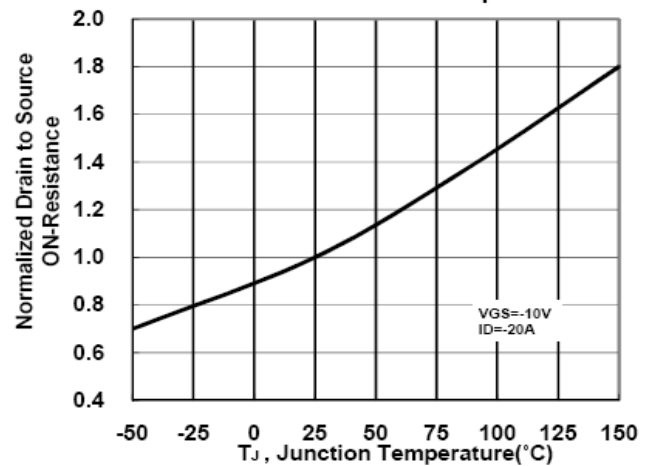
**On-Resistance VS Drain Current**



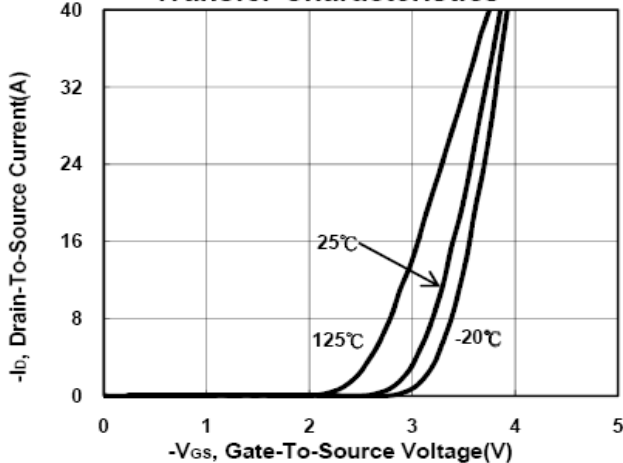
**On-Resistance VS Gate-To-Source**



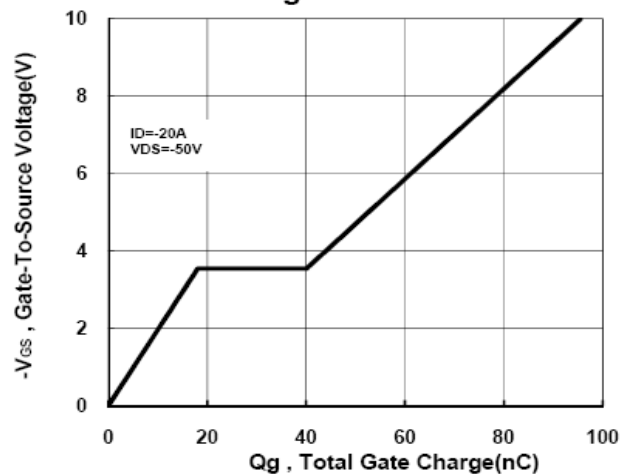
**On-Resistance VS Temperature**



**Transfer Characteristics**



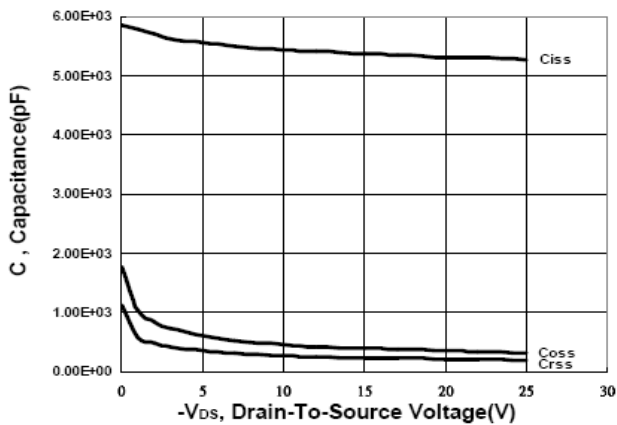
**Gate charge Characteristics**



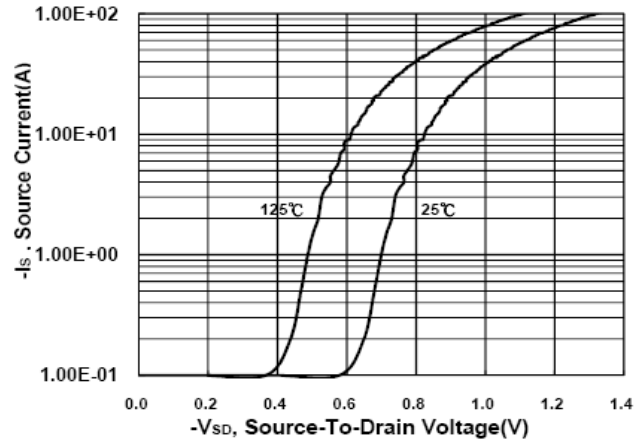
# P6010DTFG

## P-Channel Enhancement Mode MOSFET

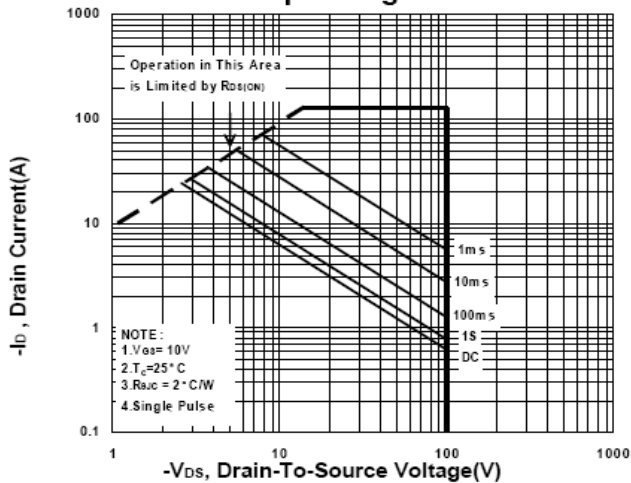
**Capacitance Characteristic**



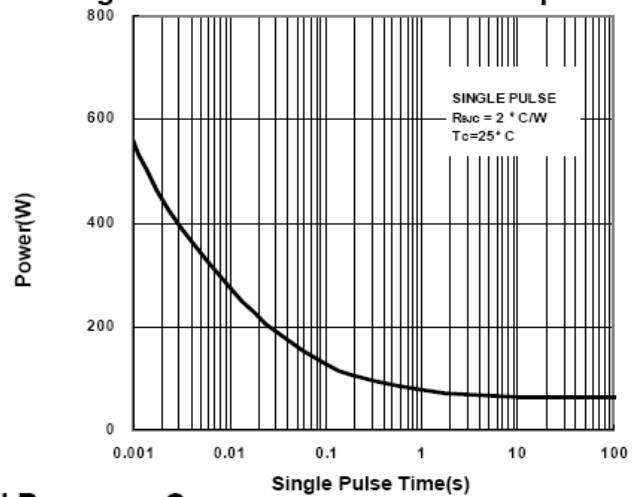
**Body Diode Forward Voltage VS Source current**



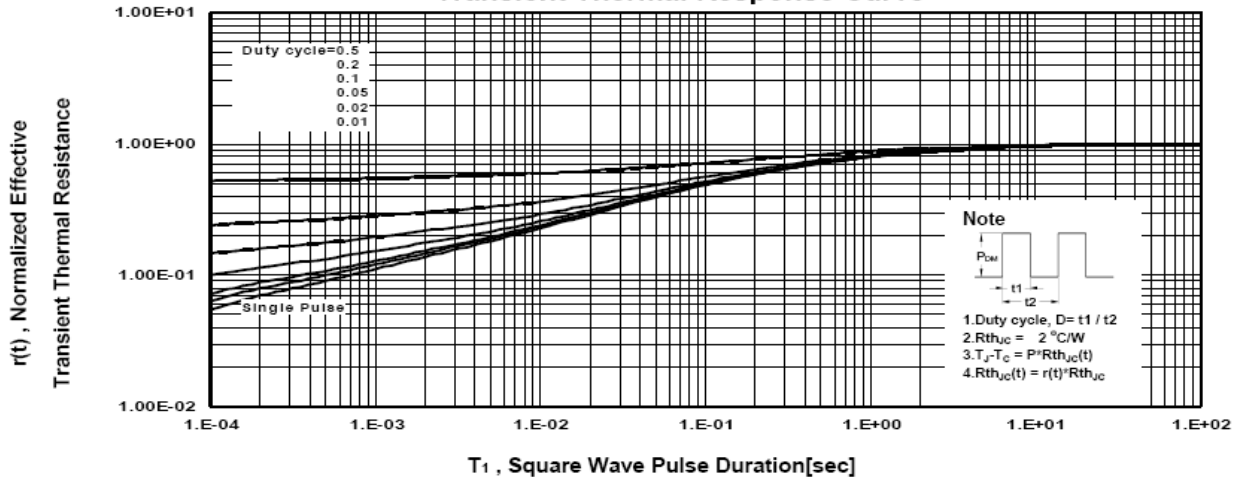
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



# P6010DTFG

## P-Channel Enhancement Mode MOSFET

### 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				

