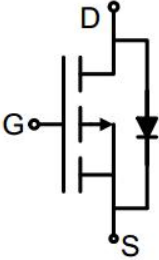



**P-Channel Enhancement Mode Power MOSFET**

<p><b>Description</b></p> <p>The G65P06F uses advanced trench technology to provide excellent <math>R_{DS(ON)}</math>, low gate charge. It can be used in a wide variety of applications.</p> <p><b>General Features</b></p> <ul style="list-style-type: none"> <li>• <math>V_{DS}</math> -60V</li> <li>• <math>I_D</math> (at <math>V_{GS} = -10V</math>) -65A</li> <li>• <math>R_{DS(ON)}</math> (at <math>V_{GS} = -10V</math>) &lt; 18m<math>\Omega</math></li> <li>• 100% Avalanche Tested</li> <li>• RoHS Compliant</li> </ul> <p><b>Application</b></p> <ul style="list-style-type: none"> <li>• Power switch</li> <li>• DC/DC converters</li> </ul>		 <p>Schematic diagram</p>  <p>TO-220F</p>	
<b>Device</b>	<b>Package</b>	<b>Marking</b>	<b>Packaging</b>
G65P06F	TO-220F	G65P06	50pcs/Tube

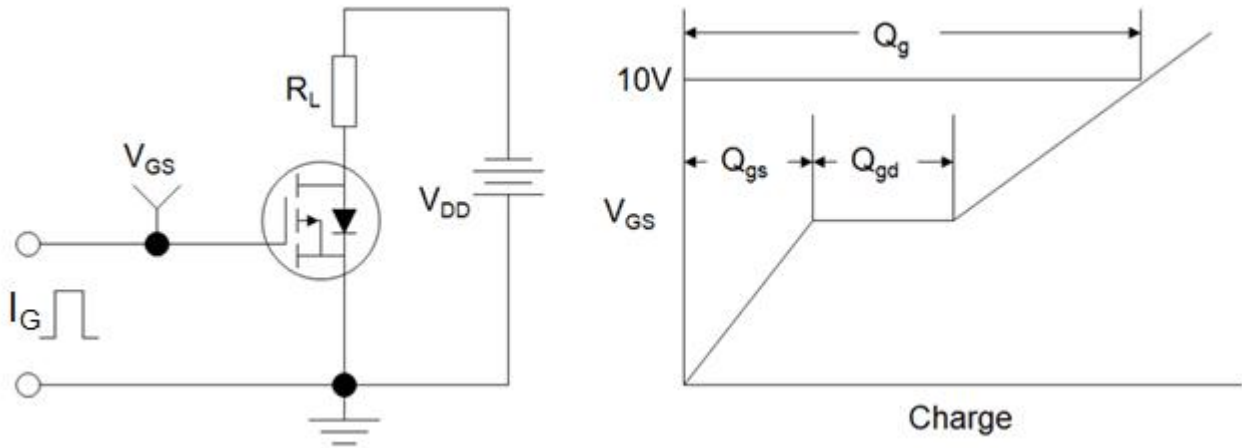
<b>Absolute Maximum Ratings</b> $T_C = 25^\circ C$ , unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Continuous Drain Current	$I_D$	-65	A
Pulsed Drain Current (note1)	$I_{DM}$	-260	A
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Power Dissipation	$P_D$	39	W
Single pulse avalanche energy (note3)	$E_{AS}$	225	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 To 150	$^\circ C$
<b>Thermal Resistance</b>			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	$R_{thJA}$	60	$^\circ C/W$
Maximum Junction-to-Case	$R_{thJC}$	3.2	$^\circ C/W$

<b>Specifications</b> $T_J = 25^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
<b>Static Parameters</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = -250\mu A$	-60	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -60V, V_{GS} = 0V$	--	--	-1	$\mu A$
Gate-Source Leakage	$I_{GSS}$	$V_{GS} = \pm 20V$	--	--	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-2	-2.6	-3.5	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -20A$	--	13	18	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS} = -5V, I_D = -20A$	--	37	--	S
<b>Dynamic Parameters</b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0V,$ $V_{DS} = -25V,$ $f = 1.0\text{MHz}$	--	6477	--	pF
Output Capacitance	$C_{oss}$		--	337	--	
Reverse Transfer Capacitance	$C_{rss}$		--	350	--	
Total Gate Charge	$Q_g$	$V_{DD} = -30V,$ $I_D = -20A,$ $V_{GS} = -10V$	--	75	--	nC
Gate-Source Charge	$Q_{gs}$		--	16	--	
Gate-Drain Charge	$Q_{gd}$		--	19	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = -30V,$ $I_D = -30A,$ $R_G = 3\Omega$	--	18	--	ns
Turn-on Rise Time	$t_r$		--	20	--	
Turn-off Delay Time	$t_{d(off)}$		--	55	--	
Turn-off Fall Time	$t_f$		--	35	--	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Body Diode Current	$I_S$	$T_C = 25^\circ\text{C}$	--	--	-65	A
Body Diode Voltage	$V_{SD}$	$T_J = 25^\circ\text{C}, I_{SD} = -20A, V_{GS} = 0V$	--	--	-1.2	V
Reverse Recovery Time	$T_{rr}$	$I_S = -20A, V_{GS} = 0V$ $di/dt = -100A/\mu s$	--	0.13	--	ns
Reverse Recovery Charge	$Q_{rr}$		--	0.77	--	nc

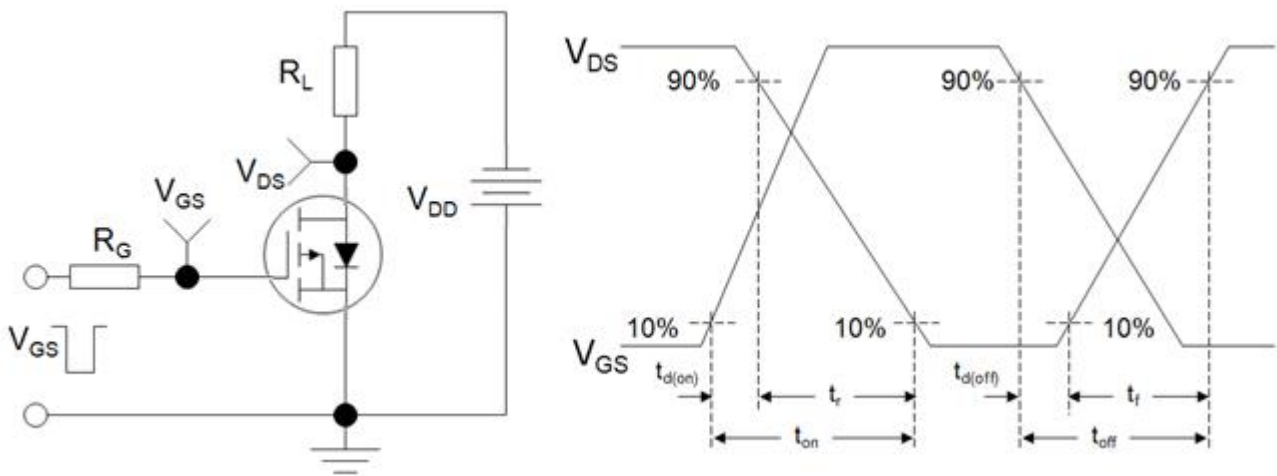
**Notes**

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical  $R_G$
3. EAS condition :  $T_J = 25^\circ\text{C}, V_{DD} = 50V, V_{GS} = 10V, L = 0.5\text{mH}, R_G = 25\Omega$

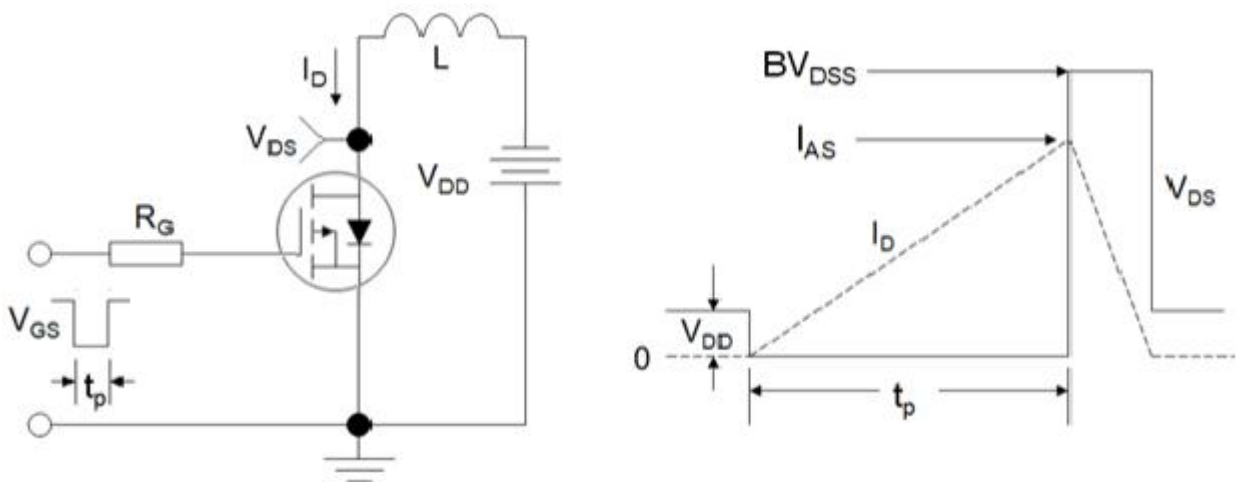
Gate Charge Test Circuit



Switch Time Test Circuit

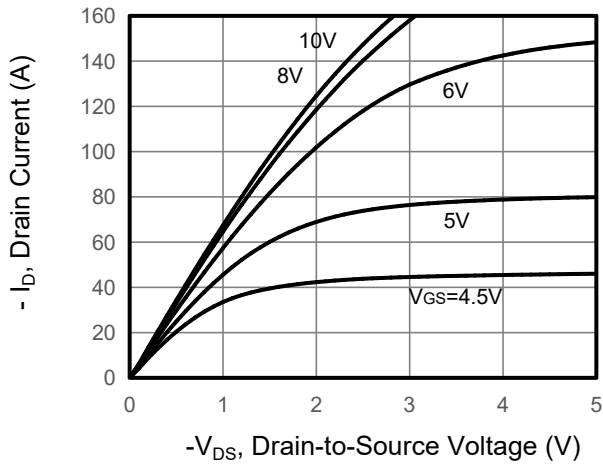


EAS Test Circuit

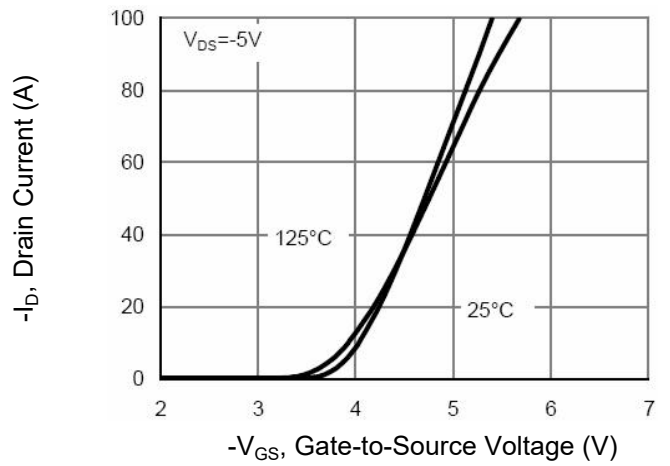


Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

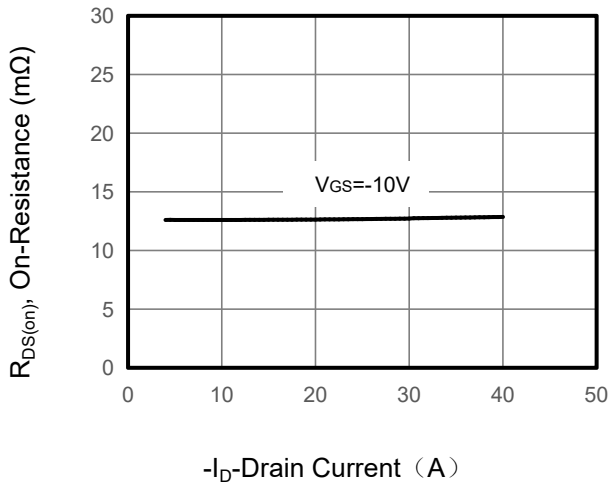
**Figure 1. Output Characteristics**



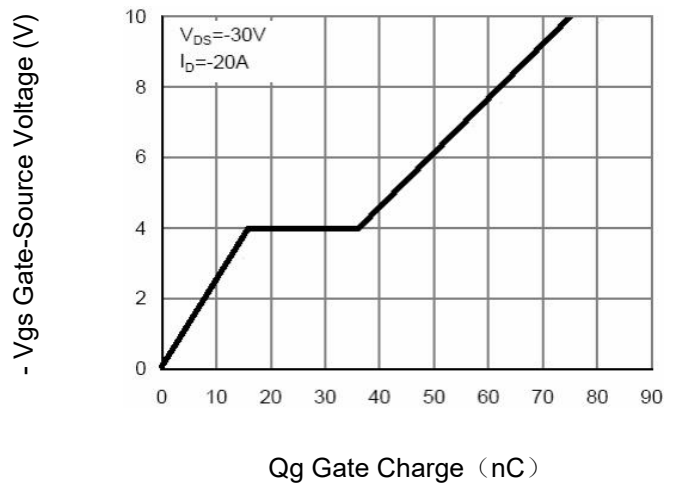
**Figure 2. Transfer Characteristics**



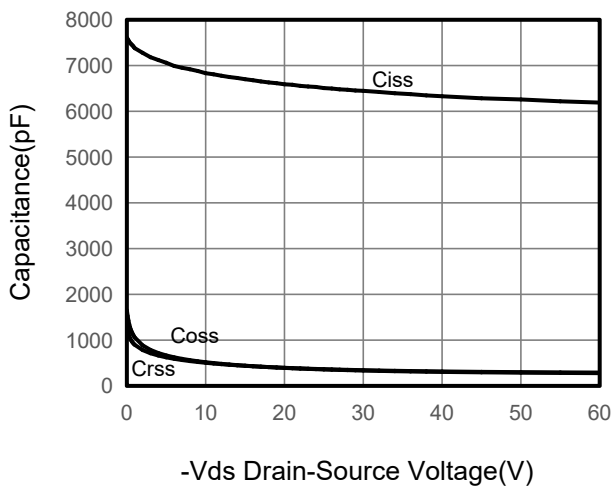
**Figure 3. Drain Source On Resistance**



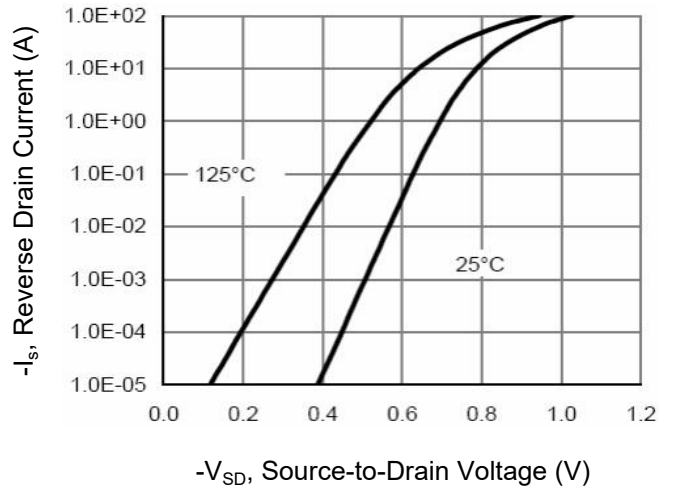
**Figure 4. Gate Charge**



**Figure 5. Capacitance**



**Figure 6. Source-Drain Diode Forward**



Typical Characteristics  $T_J = 25^\circ\text{C}$ , unless otherwise noted

Figure 7. Drain-Source On-Resistance

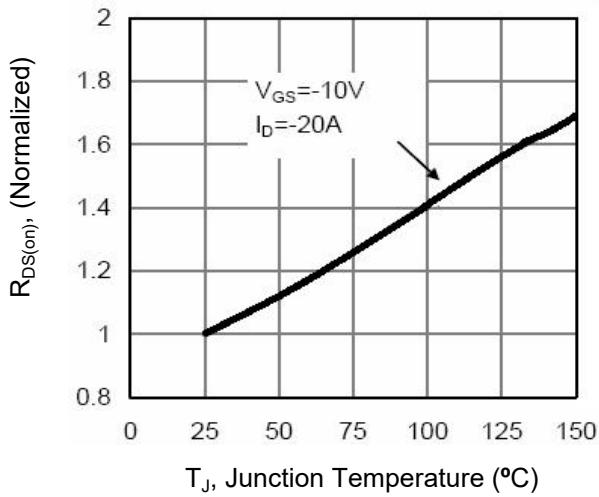


Figure 8. Safe Operation Area

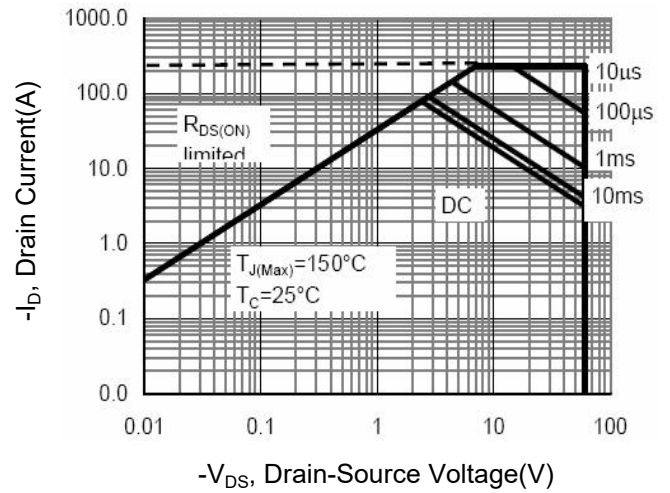
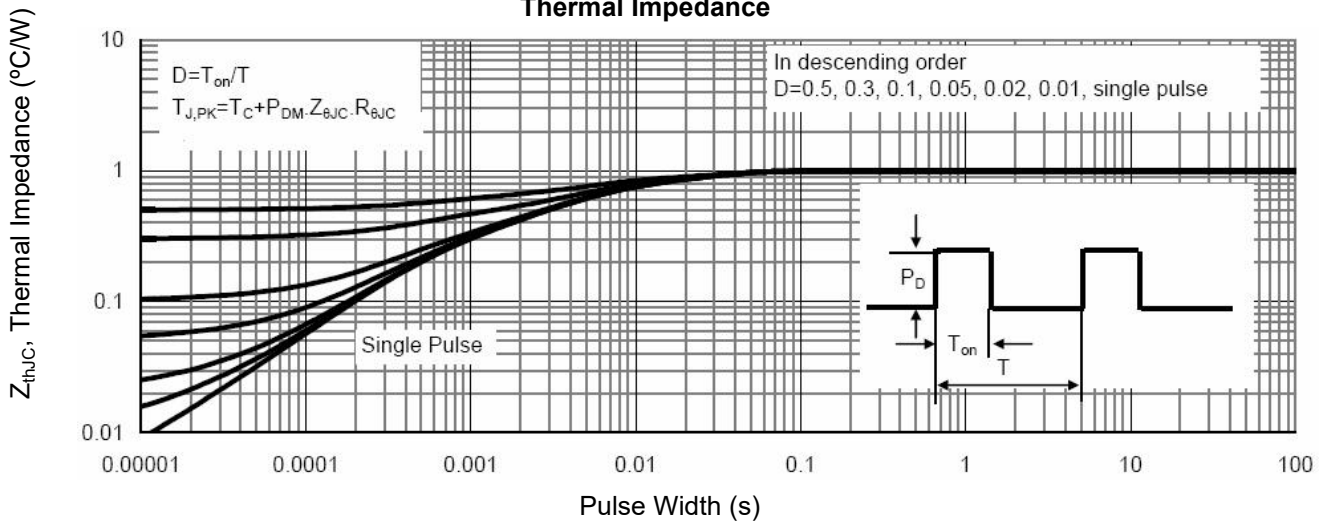
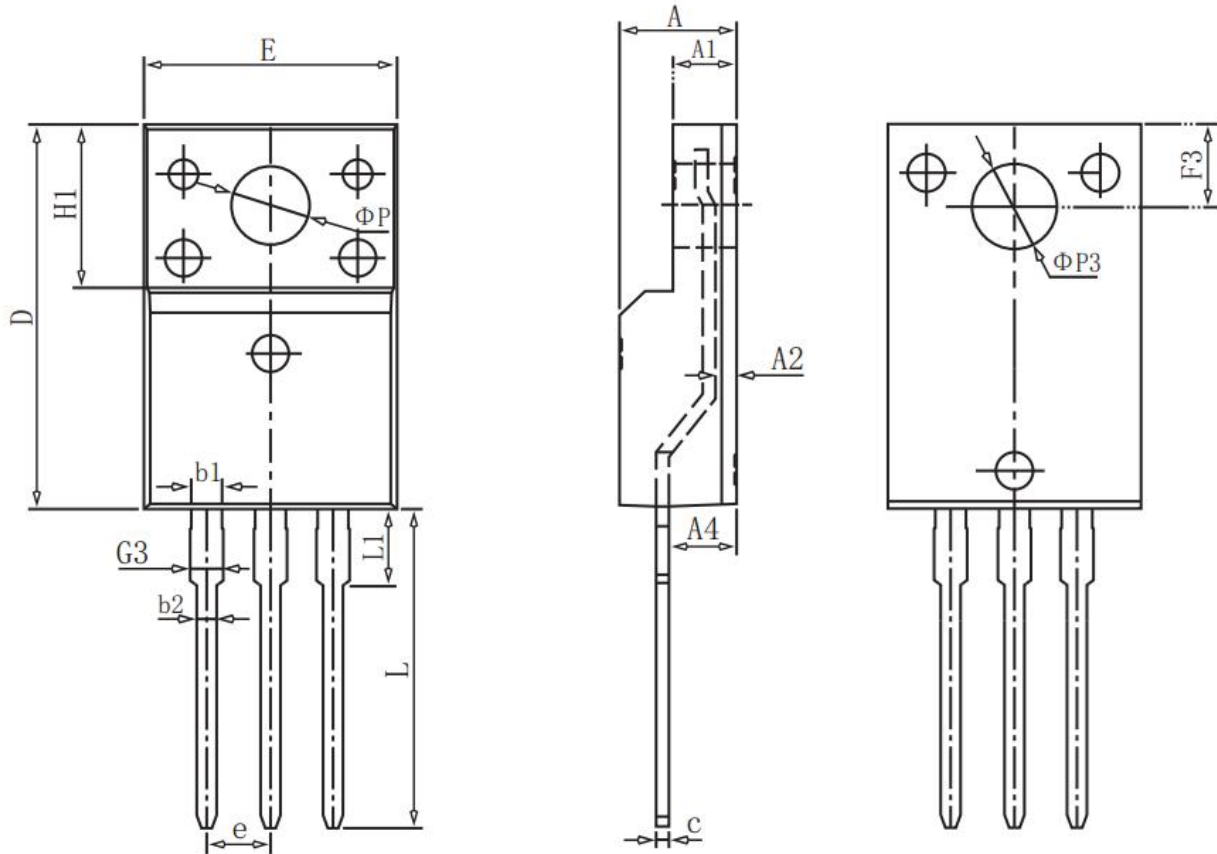


Figure 9. Normalized Maximum Transient Thermal Impedance



**TO-220F Package Information**



**COMMON DIMENSIONS**

SYMBOL	mm		
	MIN	NOM	MAX
E	10.00	10.20	10.40
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	0.65	0.85	1.30
A4	2.55	2.75	2.95
c	0.40	0.50	0.65
D	15.57	15.87	16.17
H1	6.70REF		
e	2.54BSC		
$\Phi P$	3.183REF		
L	12.68	12.98	13.28
L1	3.25	3.45	3.65
$\Phi P3$	3.45REF		
F3	3.10	3.30	3.50
G3	1.10	1.30	1.50
b1	1.05	1.20	1.35
b2	0.70	0.80	0.92