

TM150P04T

P-Channel Enhancement Mosfet

General Description

- Low $R_{DS(ON)}$
- RoHS and Halogen-Free Compliant

Applications

- Load switch
- PWM

General Features

$V_{DS} = -40V$ $I_D = -150A$

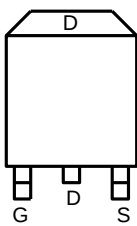
$R_{DS(ON)} = 3.0 m\Omega$ (typ.) @ $V_{GS} = -10V$

100% UIS Tested

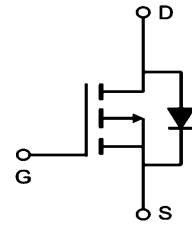
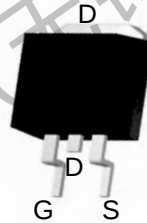
100% R_g Tested



T:TO-263-3L



Marking: 150P04



Absolute Maximum Ratings: ($T_C = 25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	-150	A
	Continuous Drain Current- $T_C = 100^\circ C$	-98	
I_{DM}	Pulsed Drain Current	-560	
P_D	Power Dissipation	250	W
E_{AS}	Single pulse avalanche energy	612	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	2	$^\circ C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	$^\circ C/W$

TM150P04T

P-Channel Enhancement Mosfet

Electrical Characteristics (T_C=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250μA	-40	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-40V, V _{GS} =0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1.0	-1.75	-2.0	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-75A	-	3.0	4.3	mΩ
		V _{GS} =-4.5V, I _D =-75A	-	4.4	5.5	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-75A	-	30	-	S
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, F=1.0MHz	-	14177	-	PF
Output Capacitance	C _{oss}		-	1067	-	PF
Reverse Transfer Capacitance	C _{rss}		-	301	-	PF
Switching Characteristics (Note 2)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-20V, I _D =-75A V _{GS} =-10V, R _G =1.6Ω	-	18	-	nS
Turn-on Rise Time	t _r		-	13	-	nS
Turn-Off Delay Time	t _{d(off)}		-	90	-	nS
Turn-Off Fall Time	t _f		-	15	-	nS
Total Gate Charge	Q _g	V _{DS} =-20V, I _D =-75A, V _{GS} =-10V	-	104.4	-	nC
Gate-Source Charge	Q _{gs}		-	20.8	-	nC
Gate-Drain Charge	Q _{gd}		-	13.5	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage	V _{SD}	V _{GS} =0V, I _S =-75A	-	-	-1.3	V
Diode Forward Current	I _S		-	-	-150	A
Reverse Recovery Time	t _{rr}	T _J = 25°C, I _F =-75A	-	-	28	nS
Reverse Recovery Charge	Q _{rr}	di/dt = 100A/μs	-	-	26	nC

TM150P04T

P-Channel Enhancement Mosfet

Typical Electrical and Thermal Characteristics

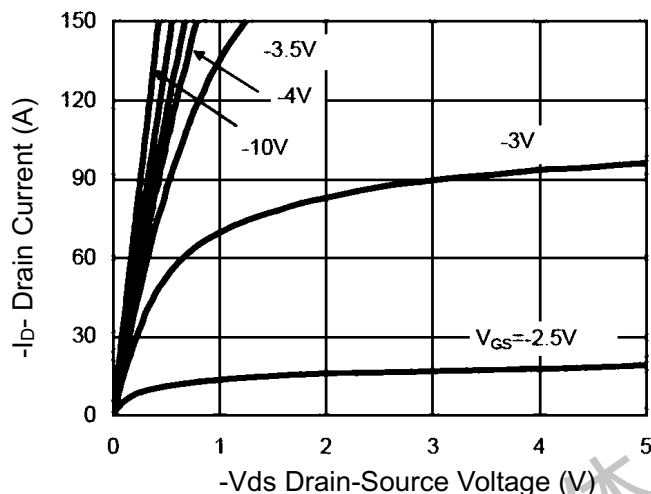


Figure 1 Output Characteristics

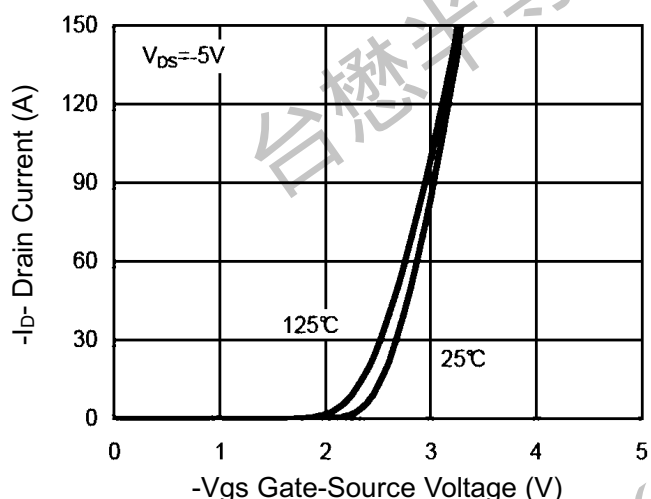


Figure 2 Transfer Characteristics

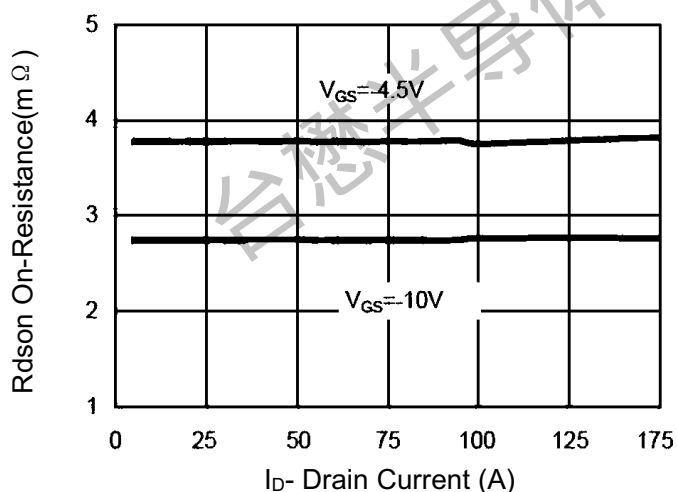


Figure 3 Rdson- Drain Current

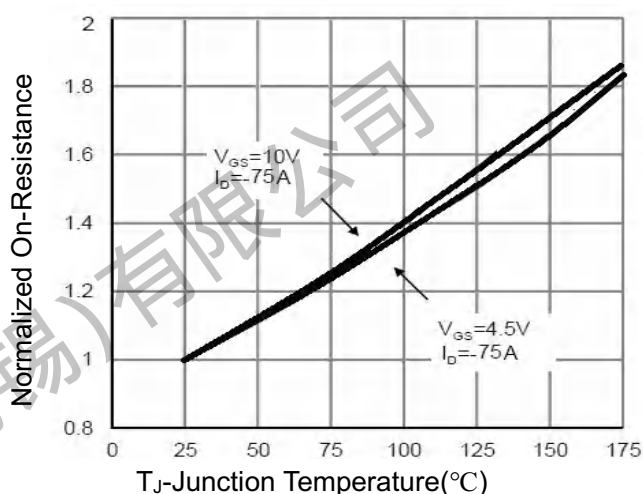


Figure 4 Rdson-Junction Temperature

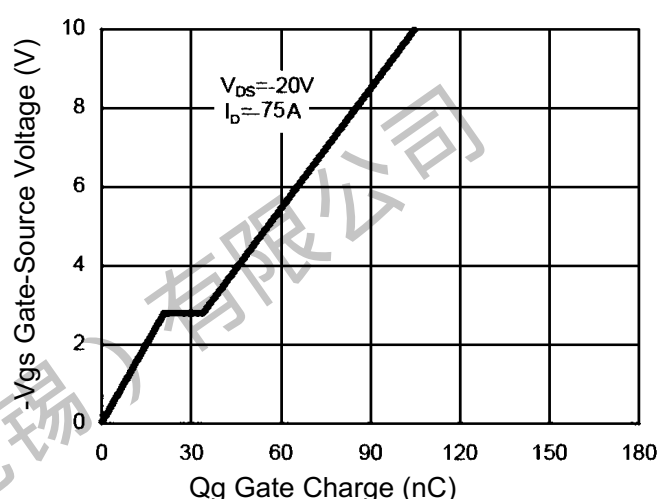


Figure 5 Gate Charge

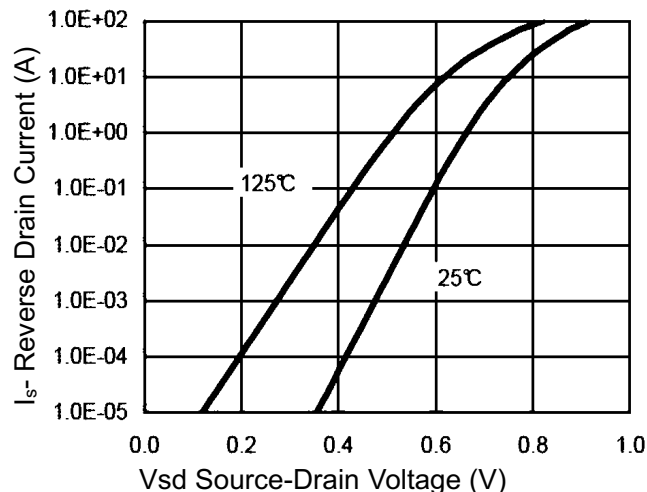


Figure 6 Source- Drain Diode Forward

TM150P04T

P-Channel Enhancement Mosfet

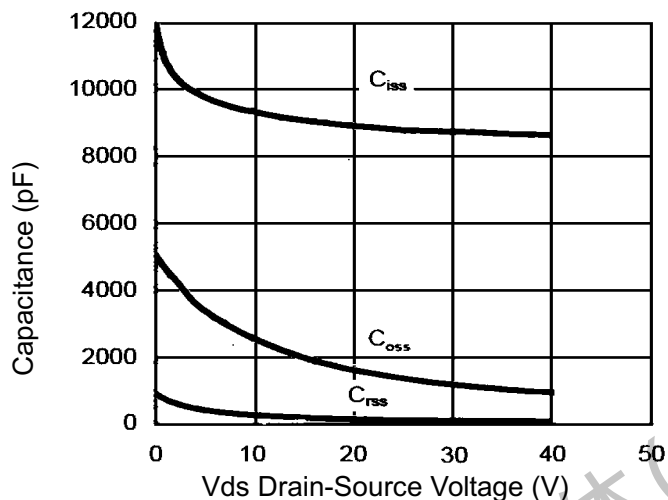


Figure 7 Capacitance vs Vds

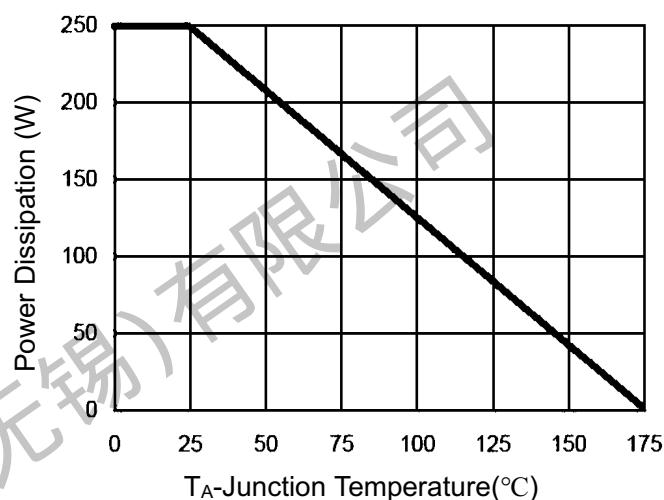


Figure 9 Power De-rating

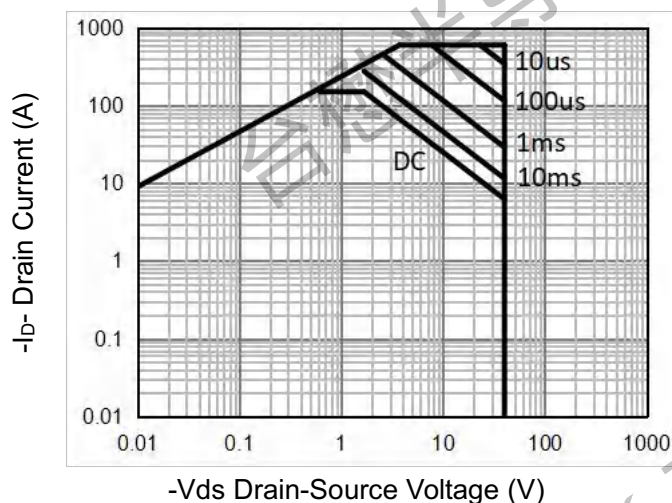


Figure 8 Safe Operation Area (Note 3)

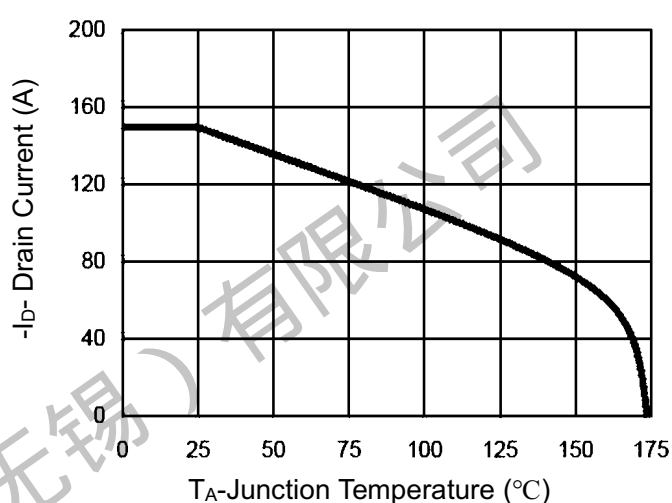


Figure 10 Current De-rating

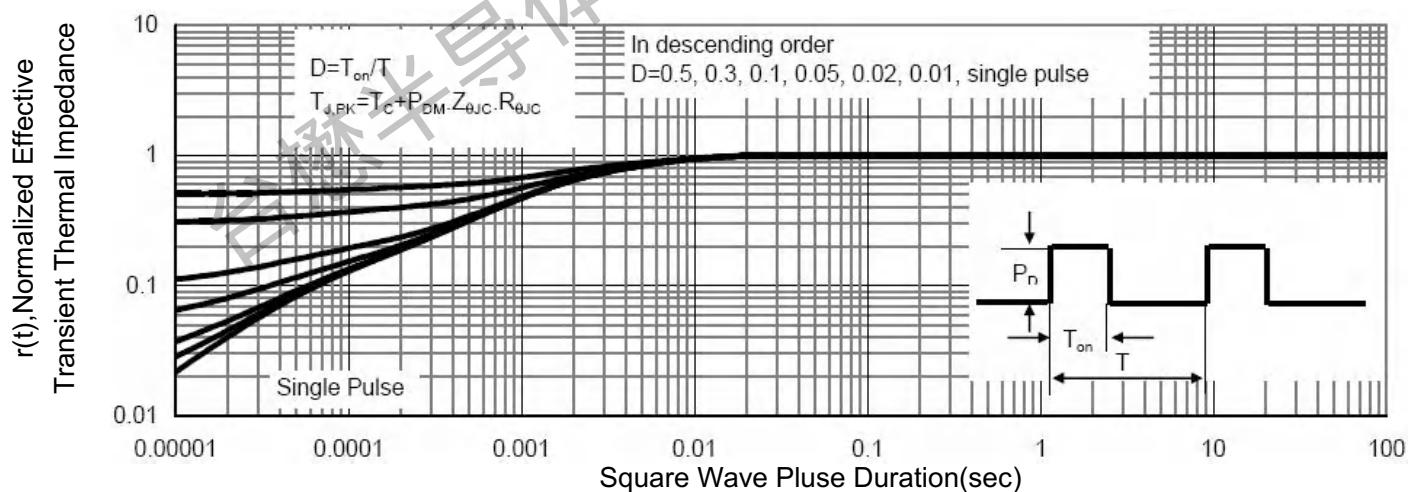
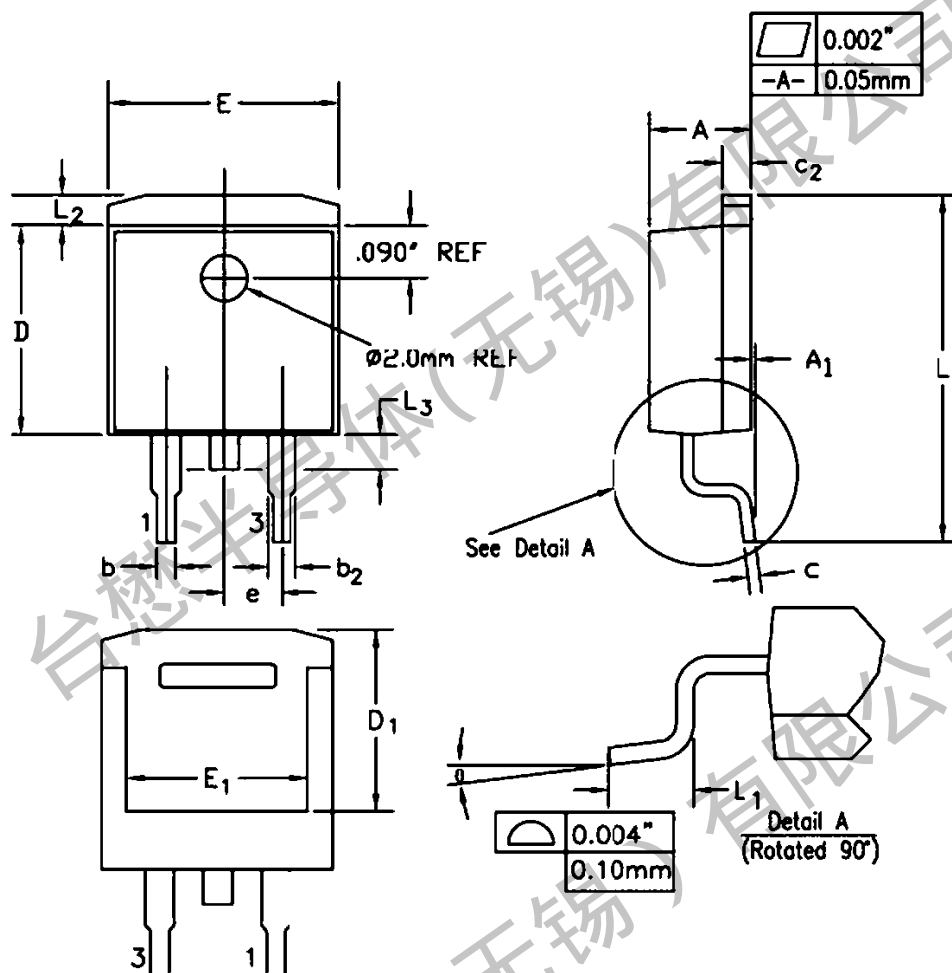


Figure 11 Normalized Maximum Transient Thermal Impedance

TM150P04T

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Package Mechanical Data: TO-263-3L



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.170	0.180	4.32	4.57	
A1	-	0.010	-	0.25	
b	0.028	0.037	0.71	0.94	
b2	0.045	0.055	1.15	1.40	
c	0.018	0.024	0.46	0.61	
c2	0.048	0.055	1.22	1.40	
D	0.350	0.370	8.89	9.40	
D1	0.315	0.324	8.01	8.23	
E	0.395	0.405	10.04	10.28	
E1	0.310	0.318	7.88	8.08	
e	0.100 BSC.		2.54 BSC.		
L	0.580	0.620	14.73	15.75	
L1	0.090	0.110	2.29	2.79	
L2	0.045	0.055	1.15	1.39	
L3	0.050	0.070	1.27	1.77	
θ	0°	8°	0°	8°	

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Revision history:

Date	Rev	Description	Page
2023.09.19	23.09	Original	