



TMD15P06D P-CHANNEL ENHANCEMENT MOSFET

General Description

The TMD15P06D uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

- Power switching application
- Hard Switched and High Frequency Circuits
- Uninterruptible Power Supply

Product Summary

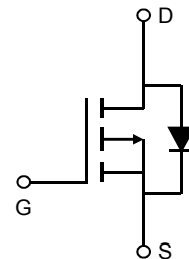
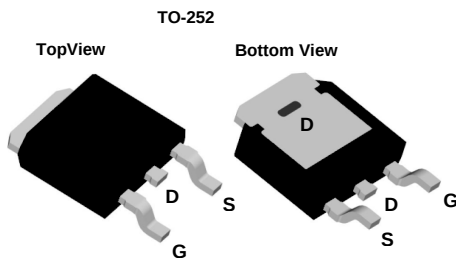
$V_{DS} = -60V, I_D = -16A$

$R_{DS(ON)} < 70m\Omega @ V_{GS} = 10V$

$R_{DS(ON)} < 90m\Omega @ V_{GS} = 4.5V$

100% UIS Tested

100% R_g Tested



Absolute Maximum Ratings@ $T_J = 25^\circ C$ (unless otherwise specified)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D @ T_C = 25^\circ C$	Drain Current, $V_{GS} @ 10V$	-16	A
$I_D @ T_C = 100^\circ C$	Drain Current, $V_{GS} @ 10V$	-10	A
I_{DM}	Pulsed Drain Current ¹	-60	A
$P_D @ T_C = 25^\circ C$	Total Power Dissipation	32.8	W
$P_D @ T_A = 25^\circ C$	Total Power Dissipation	2	W
EAS	Single Pulse Avalanche Energy ⁴	32	mJ
TSTG	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$
R_{thj-c}	Maximum Thermal Resistance, Junction-case	3.8	$^\circ C/W$
R_{thj-a}	Maximum Thermal Resistance, Junction-ambient (PCB mount) ³	62.5	$^\circ C/W$

Electrical Characteristics@T_j=25°C(unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =-250uA	-60	-	-	V
RDS(ON)	Static Drain-Source On-Resistance ²	V _{GS} =-10V, I _D =-10A	-	-	70	mΩ
		V _{GS} =-4.5V, I _D =-7A	-	-	90	mΩ
VGS(th)	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =-250uA	-1	-	-3	V
g _{fs}	Forward Transconductance	V _{DS} =-10V, I _D =-10A	-	21	-	S
IDSS	Drain-Source Leakage Current	V _{DS} =-48V, V _{GS} =0V	-	-	-25	uA
IGSS	Gate-Source Leakage	V _{GS} =+20V, V _{DS} =0V	-	-	+100	nA
Q _g	Total Gate Charge	I _D =-10A	-	33	52.8	nC
Q _{gs}	Gate-Source Charge	V _{DS} =-30V	-	6	-	nC
Q _{gd}	Gate-Drain ("Miller") Charge	V _{GS} =-10V	-	6	-	nC
td(on)	Turn-on Delay Time	V _{DS} =-30V	-	11	-	ns
t _r	Rise Time	I _D =-10A	-	21	-	ns
td(off)	Turn-off Delay Time	R _G =3.3Ω	-	41	-	ns
t _f	Fall Time	V _{GS} =-10V	-	42	-	ns
C _{iss}	Input Capacitance	V _{GS} =0V	-	1860	2976	pF
C _{oss}	Output Capacitance	V _{DS} =-30V	-	110	-	pF
C _{rss}	Reverse Transfer Capacitance	f=1.0MHz	-	80	-	pF
VSD	Forward On Voltage ²	I _S =-10A, V _{GS} =0V	-	-	-1.3	V
trr	Reverse Recovery Time	I _S =-10A, V _{GS} =0V, dI/dt=-100A/μs	-	21	-	ns
Q _{rr}	Reverse Recovery Charge		-	17	-	nC

Notes:

- 1.Pulse width limited by Max. junction temperature.
- 2.Pulse test
- 3.Surface mounted on 1 in² copper pad of FR4 board
- 4.Starting T_j=25°C

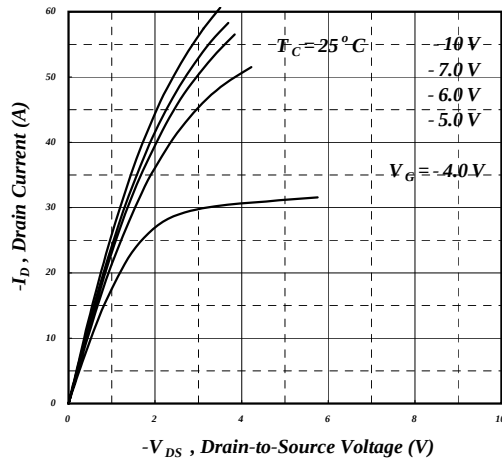


Fig 1. Typical Output Characteristics

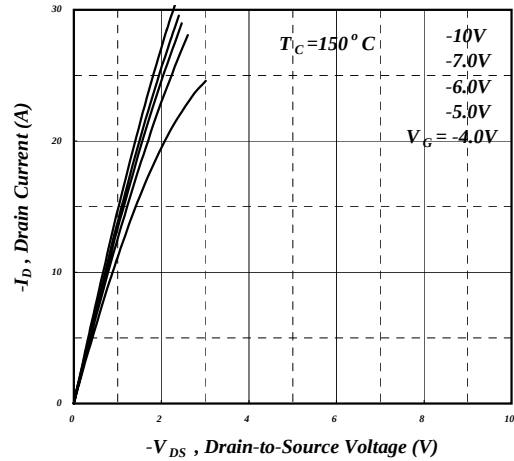


Fig 2. Typical Output Characteristics

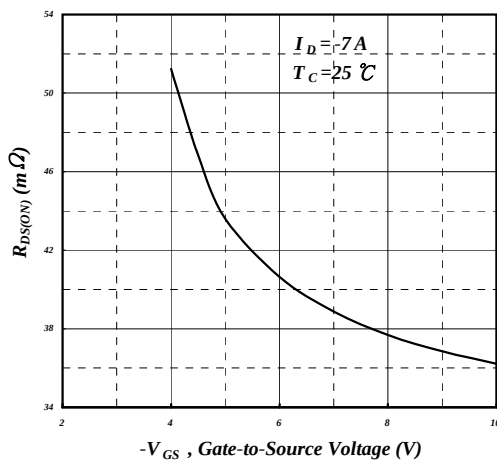


Fig 3. On-Resistance v.s. Gate Voltage

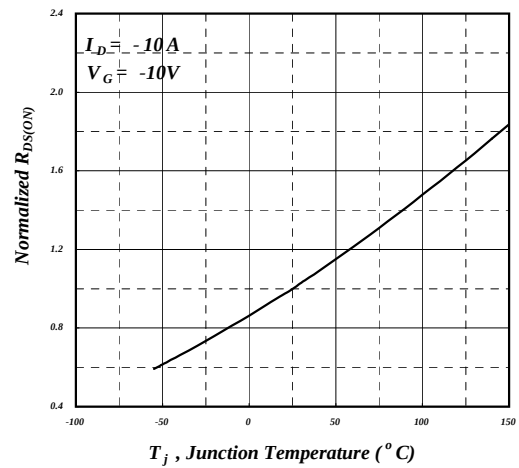


Fig 4. Normalized On-Resistance
v.s. Junction Temperature

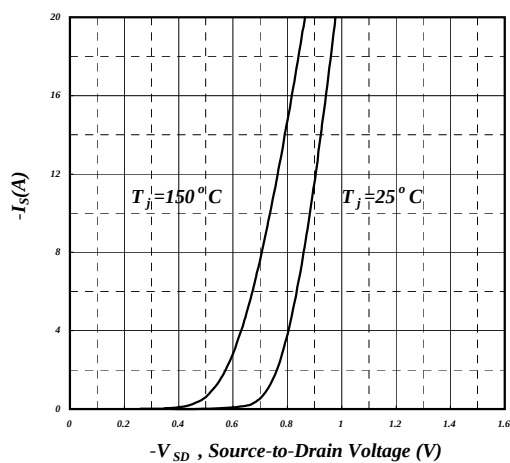


Fig 5. Forward Characteristic of
Reverse Diode

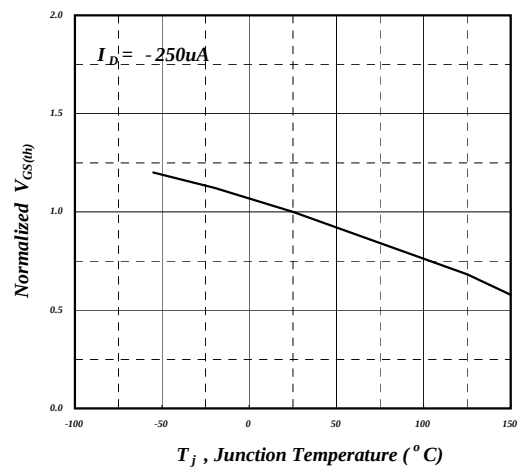


Fig 6. Gate Threshold Voltage v.s.
Junction Temperature

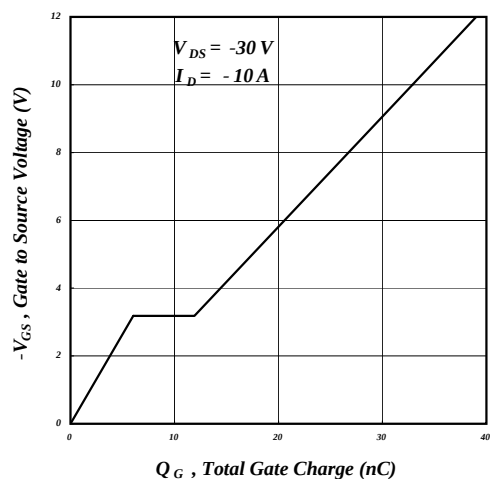


Fig 7. Gate Charge Characteristics

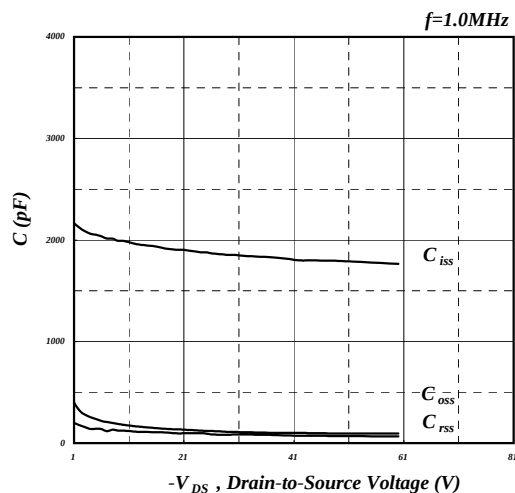


Fig 8. Typical Capacitance Characteristics

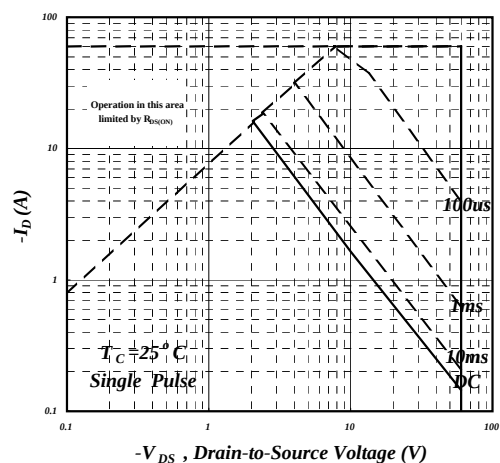


Fig 9. Maximum Safe Operating Area

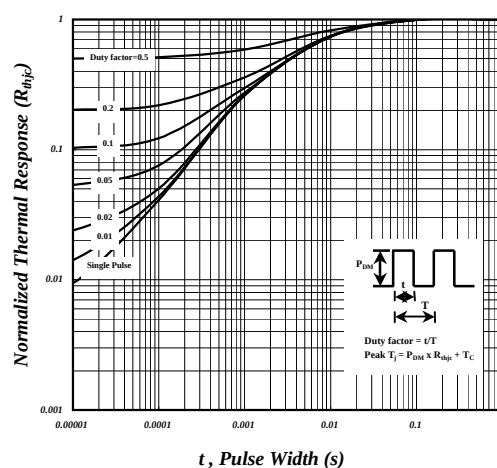


Fig 10. Effective Transient Thermal Impedance

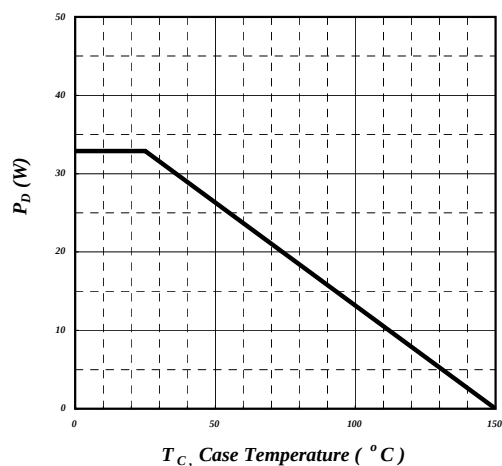


Fig 11. Typical Power Dissipation

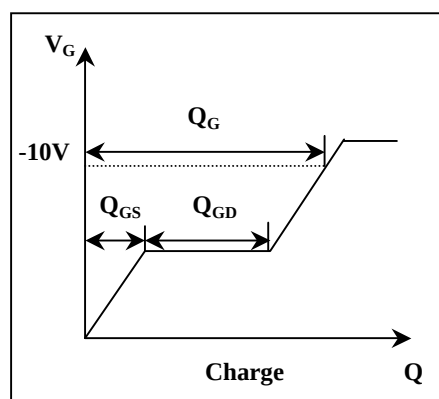


Fig 12. Gate Charge Waveform

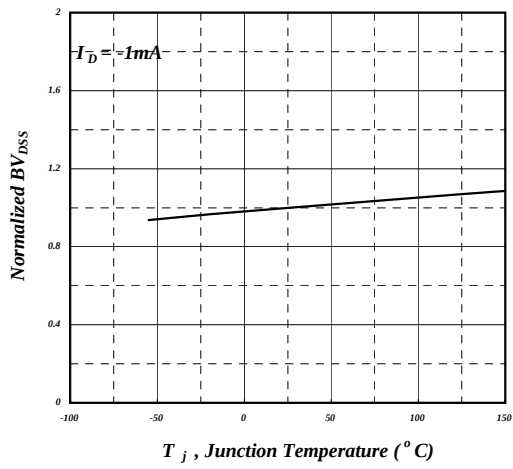


Fig 13. Normalized BV_{DSS} v.s. Junction Temperature

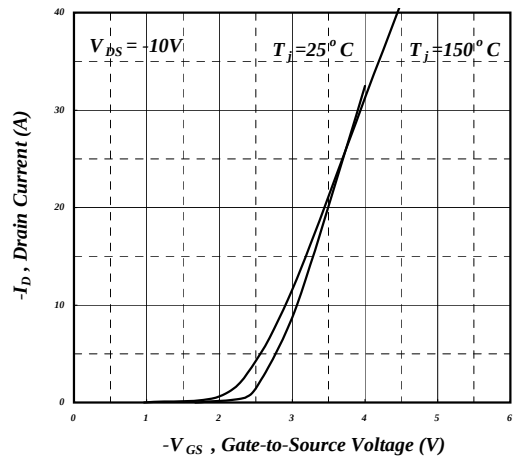


Fig 14. Transfer Characteristics

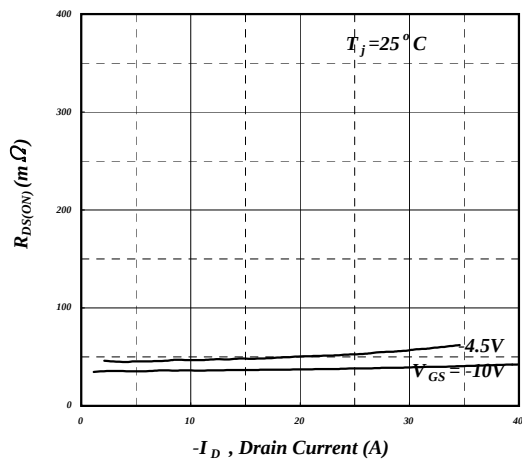


Fig 15. Typ. Drain-Source on State Resistance

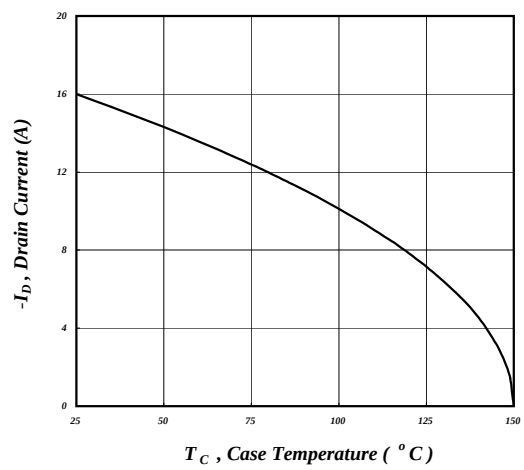
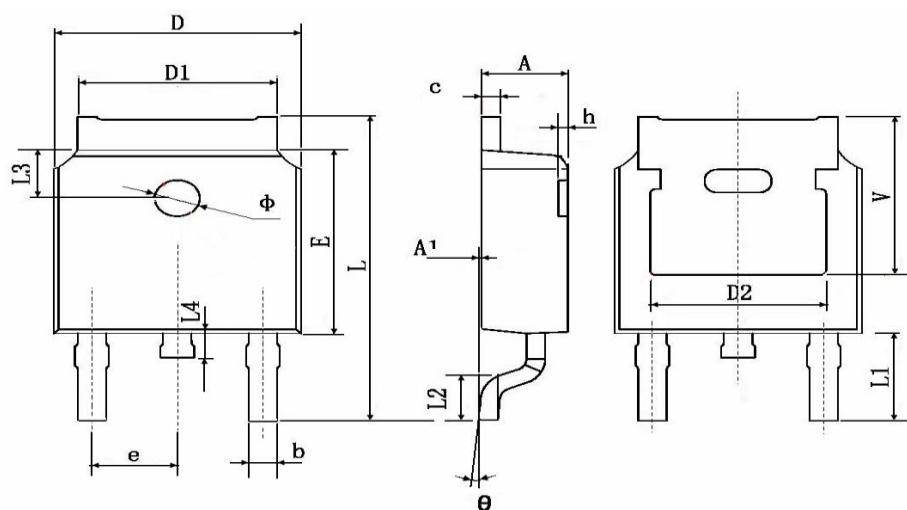


Fig 16. Drain Current v.s. Case Temperature

TO-252 Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	