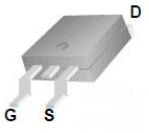
Features

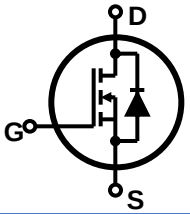
- Low gate charge
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant
- Halogen free package
- JEDEC Qualification

V_{DSS} = 770 V @T_{jmax}
I_D = 5A
$R_{DS(on)}$ = 1.65 Ω(max) @ V_{GS}= 10 V

D-PAK



I-PAK



Device	Package	Marking	Remark
TMD6N70/TMU6N70	D-PAK/I-PAK	TMD6N70/TMU6N70	RoHS
TMD6N70G/TMU6N70G	D-PAK/I-PAK	TMD6N70G/TMU6N70G	Halogen Free

Absolute Maximum Ratings

Parameter		Symbol	TMD6N70(G)/TMU6N70(G)	Unit
Drain-Source Voltage		V_{DSS}	700	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	T_C = 25 ℃	I_D	5	A
	T_C = 100 ℃		3.14	A
Pulsed Drain Current (Note 1)		I_{DM}	20	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	188	mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	5	A
Repetitive Avalanche Energy (Note 1)		E_{AR}	12	mJ
Power Dissipation	T_C = 25 ℃	P_D	120	W
	Derate above 25 ℃		0.96	W/℃
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Operating Junction and Storage Temperature Range		T_J, T_{STG}	-55~150	℃
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	℃

* Limited only by maximum junction temperature

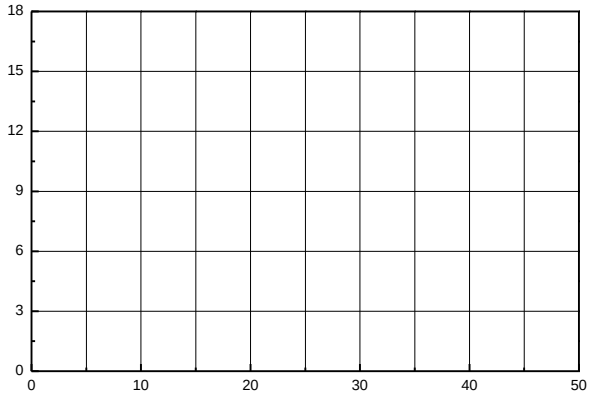
Thermal Characteristics

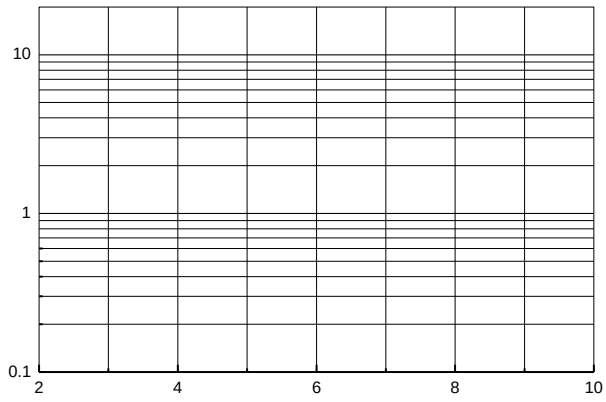
Parameter	Symbol	TMD6N70(G)/TMU6N70(G)	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	1.04	℃/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	110	℃/W

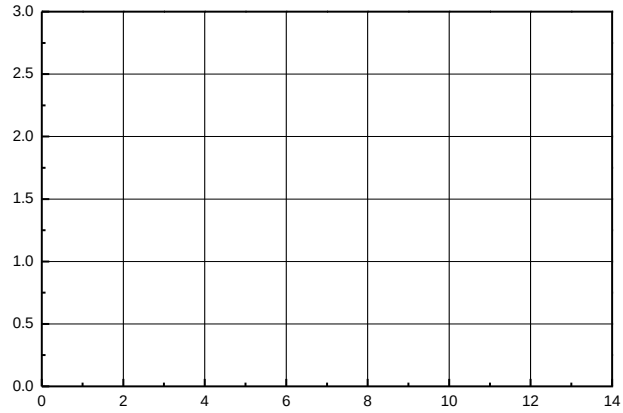
Electrical Characteristics : T_C=25℃, unless otherwise noted

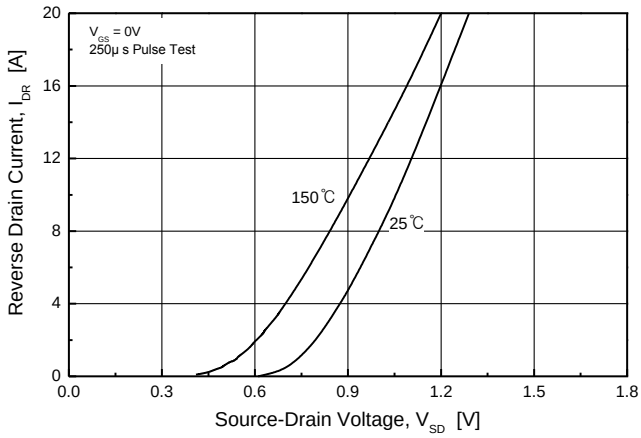
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 μA	700	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 700 V, V_{GS} = 0 V	--	--	1	μA
		V_{DS} = 560 V, T_C = 125°C	--	--	10	μA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	nA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	nA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 2.5 A	--	1.42	1.65	Ω
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 2.5 A	--	7.6	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V,	--	1120	--	pF
Output Capacitance	C_{oss}	f = 1.0 MHz	--	91	--	pF
Reverse Transfer CapacitancerResv	C_{rss}		--	6.3	--	pF
SWITCHING						
Turn-On Delay Time (Note 4,5)	$t_{d(on)}$	V_{DD} = 350 V, I_D = 5 A,	[illegible]			

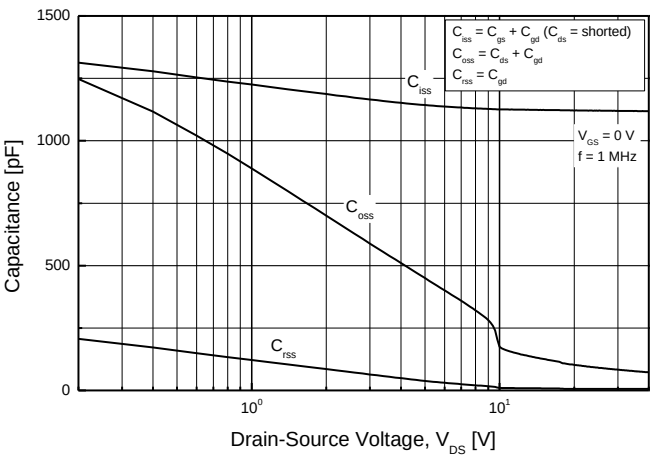
Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L=14mH, I_{AS} = 5A, V_{DD} = 50V, R_G = 25Ω, Starting T_J= 25 ℃
3 I_{SD} ≤ 5A, di/dt ≤ 200A/μs , V_{DD} ≤ BV_{DS}, Starting T_J= 25 ℃
4. Pulse Test :Pulse width ≤ 300μs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

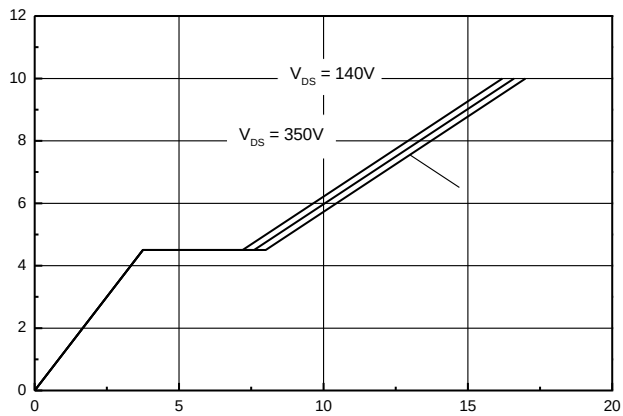

18
15
12
9
6
3
0
0
10
20
30
40
50

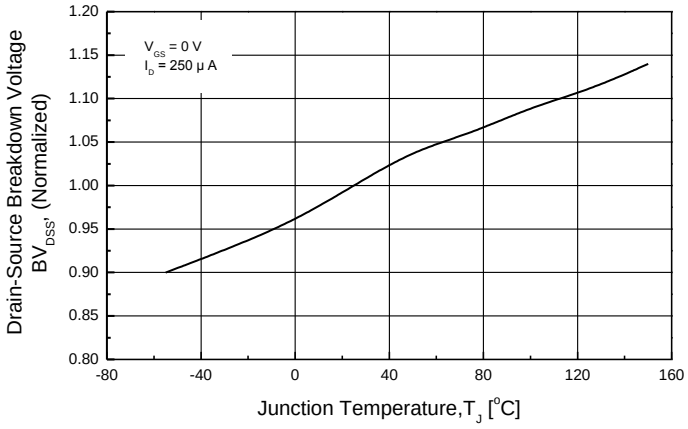

10
1
0.1
2
4
6
8
10

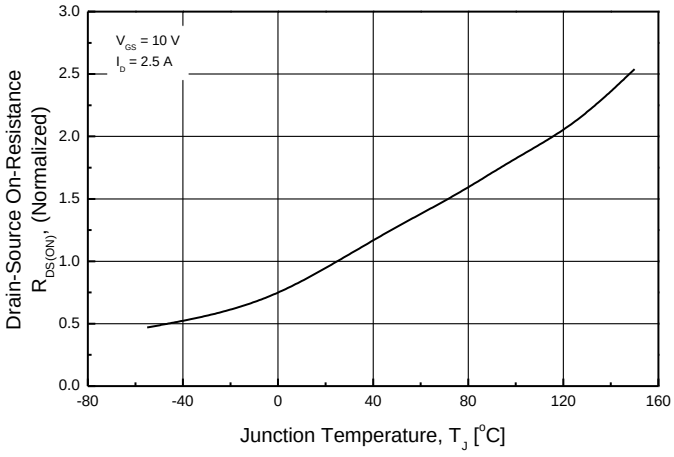

3.0
2.5
2.0
1.5
1.0
0.5
0.0
0
2
4
6
8
10
12
14

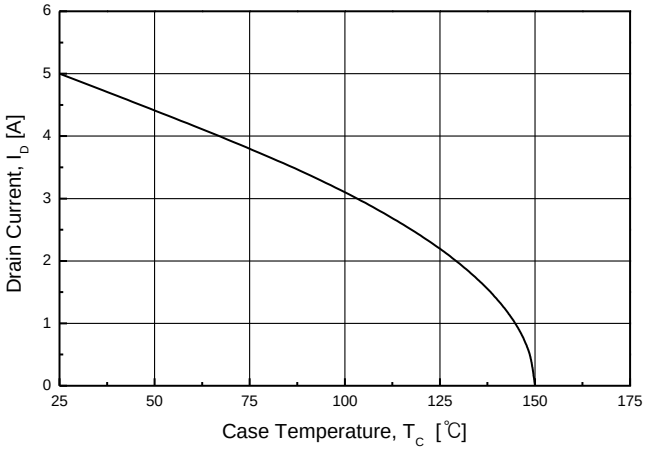

V_{GS} = 0V
250μ s Pulse Test
150℃
25℃
Reverse Drain Current, I_{DR} [A]
Source-Drain Voltage, V_{SD} [V]
20
16
12
8
4
0
0.0
0.3
0.6
0.9
1.2
1.5
1.8

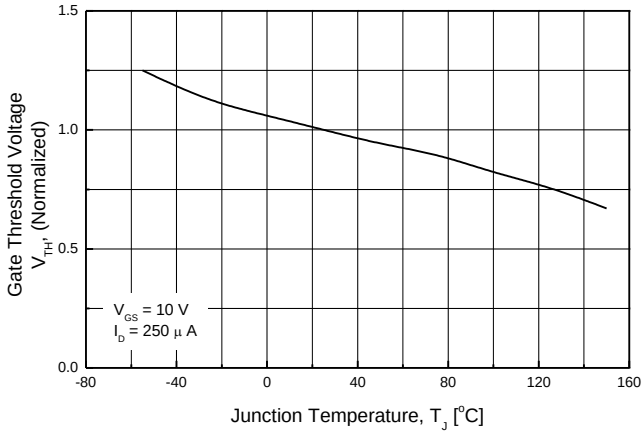

$C_{iss} = C_{gs} + C_{gd}$ (C_{ds} = shorted)
$C_{oss} = C_{ds} + C_{gd}$
$C_{rss} = C_{gd}$
C_{iss}
C_{oss}
C_{rss}
V_{GS} = 0 V
f = 1 MHz
Capacitance [pF]
Drain-Source Voltage, V_{DS} [V]
1500
1000
500
0
10^0
10^1

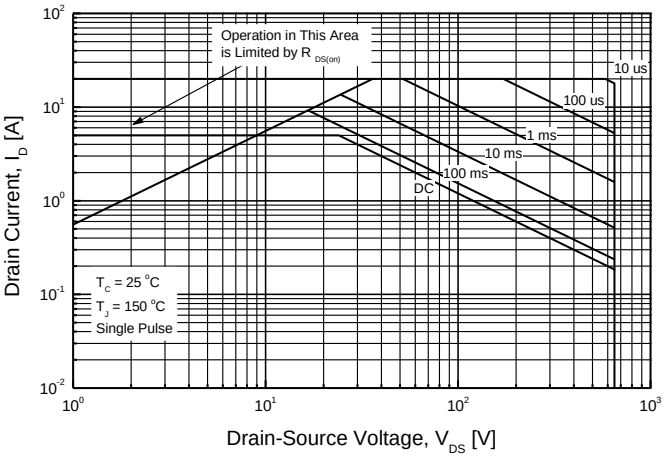

V_{DS} = 140V
V_{DS} = 350V
12
10
8
6
4
2
0
0
5
10
15
20

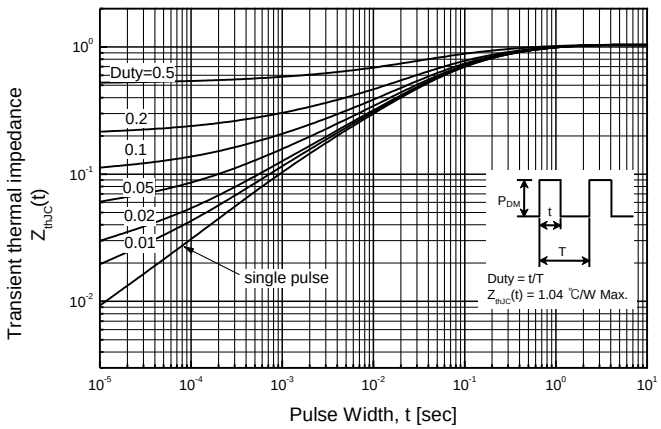

Drain-Source Breakdown Voltage
BV_{DSS}, (Normalized)
V_{GS} = 0 V
I_D = 250 μ A
Junction Temperature,T_J [°C]


Drain-Source On-Resistance
$R_{DS(ON)}$, (Normalized)
V_{GS} = 10 V
I_D = 2.5 A
Junction Temperature, T_J [°C]

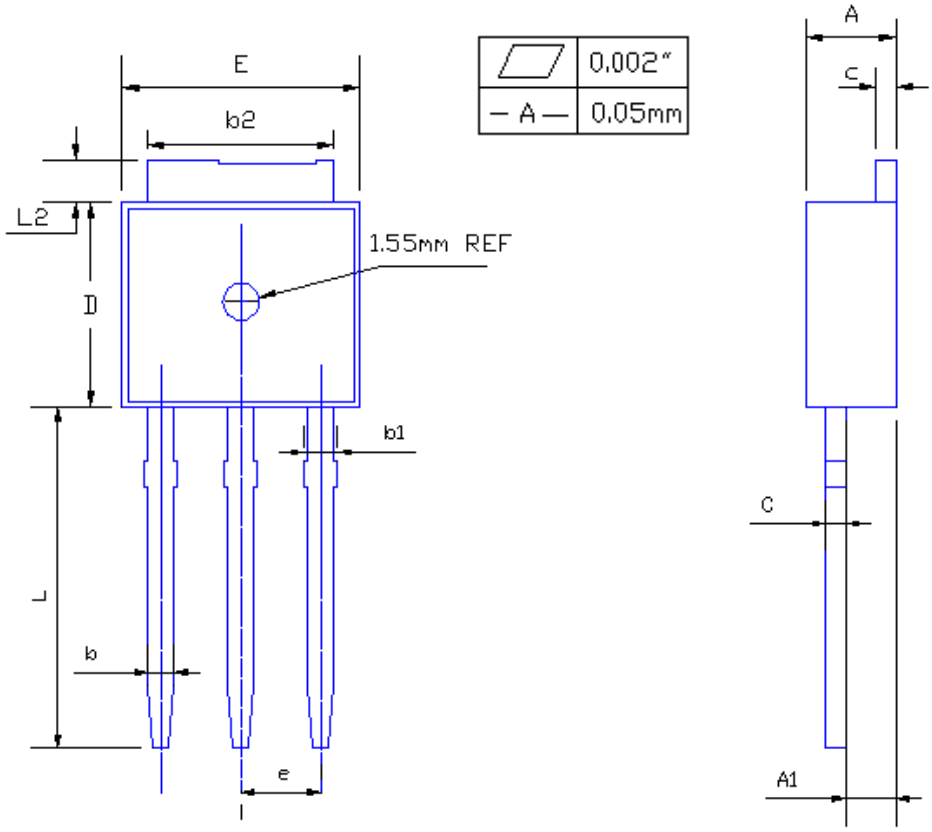

Drain Current, I_D [A]
Case Temperature, T_C [℃]


Gate Threshold Voltage
V_{TH}, (Normalized)
V_{GS} = 10 V
I_D = 250 μ A
Junction Temperature, T_J [°C]


Operation in This Area
is Limited by $R_{DS(on)}$
10 us
100 us
1 ms
10 ms
100 ms
DC
T_C = 25 °C
T_J = 150 °C
Single Pulse
Drain Current, I_D [A]
Drain-Source Voltage, V_{DS} [V]

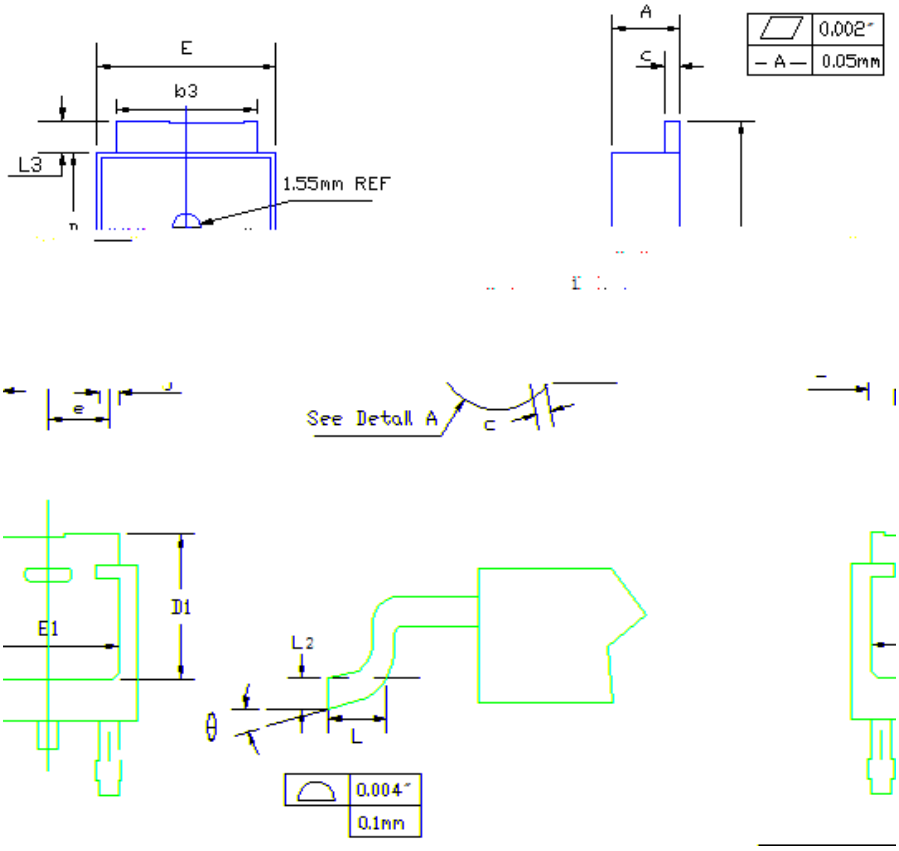

Duty=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
P_{DM}
t
T
Duty = t/T
Z_{thJC}(t) = 1.04 ℃/W Max.
Transient thermal impedance
Z_{thJC}(t)
Pulse Width, t [sec]

TO-251 (I-PAK) MECHANICAL DATA



SYMBOL	MILLIMETERS	
	MIN	MAX
A	2.19	2.38
A1	1.04	1.23
b	0.64	0.89
b1	0.84	1.14
b2	5.23	5.48
c	0.46	0.61
D	5.91	6.28
E	6.21	6.59
e	2.28 TYP	
L	8.89	9.65
L2	0.89	1.27

TO-252 (D-PAK) MECHANICAL DATA



SYMBOL	MILLIMETERS	
	MIN	MAX
A	2.19	2.38
A1	—	0.13
b	0.64	0.89
b2	0.84	1.14
b3	5.21	5.46
c	0.46	0.61
D	5.97	6.22
D1	5.21	—
E	6.35	6.73
E1	4.83	—
e	2.29BSC	
H	9.65	10.41
L	1.40	1.78
L2	0.51BSC	
L3	0.89	1.27
L4	0.64	1.01
θ	0	8