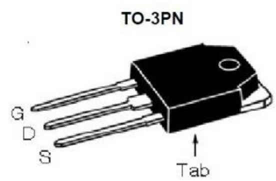
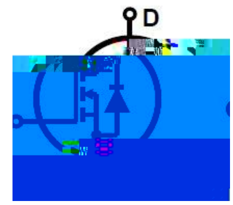
N-channel MOSFET

BV_{DSS}	I_D	$R_{DS(on)}$
600V	16A	< 0.47

Features

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





Device	Package	Marking	Remark
TMAN16N60	TO-3PN	TMAN16N60	RoHS

Absolute Maximum Ratings

Parameter		Symbol	TMAN16N60	Unit
Drain-Source Voltage		V_{DS}	600	V
Gate-Source Voltage		V_{GS}	30	V
Continuous Drain Current	T_C = 25	I_D	16	A
	T_C = 100		10.3	A
Pulsed Drain Current (Note 1)		I_{DM}	64	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	865	mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	16	A
Repetitive Avalanche Energy (Note 1)		E_{AR}	31.2	mJ
Power Dissipation	T_C = 25	P_D	312	W
	Derate above 25		2.5	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	TMAN16N60	Unit
Maximum Thermal resistance, Junction-to-Case	R_{JC}	0.4	/W
Maximum Thermal resistance, Junction-to-Ambient	R_{JA}	62.5	/W

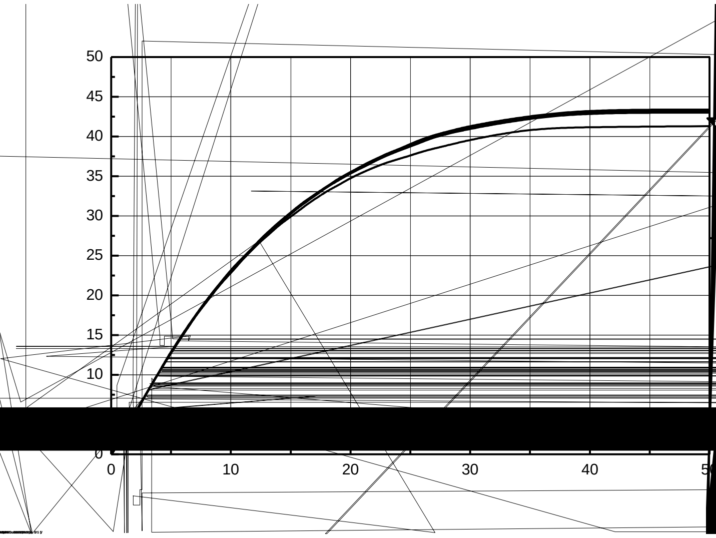
Electrical Characteristics : T_C=25 , unless otherwise noted

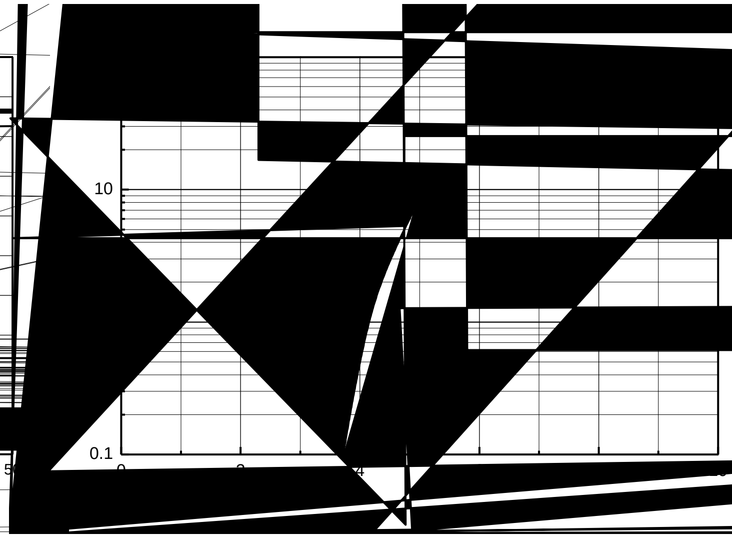
Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0 V, I_D = 250 µA	600	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 600 V, V_{GS} = 0 V	--	--	1	µA
		V_{DS} = 480 V, T_C = 125 C	--	--	10	µA
Forward Gate-Source Leakage Current	I_{GSSF}	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 = 8 A	--	0.38	0.47	
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 8 A	--	10	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V	--	2039	--	pF

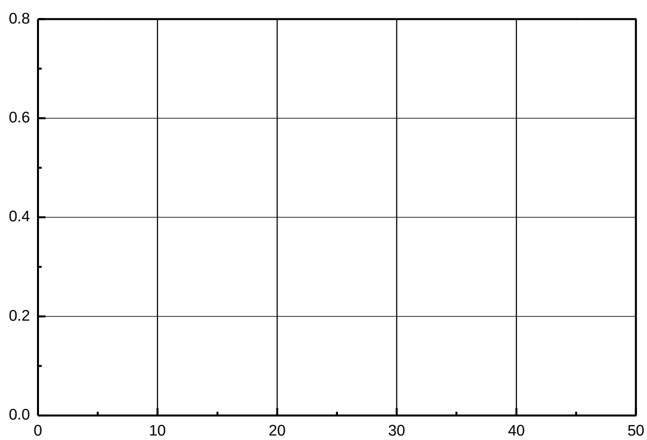
OutH10 1 400.1 Tm[(O1BT1 0(9-6(i)-4(ta)-5(n)-3(c)-6(e)] TJETBT1 0 0 1 101.33 415.22 Tm8[( )]u)-3(tH10 1C /P <</MCID 134/L

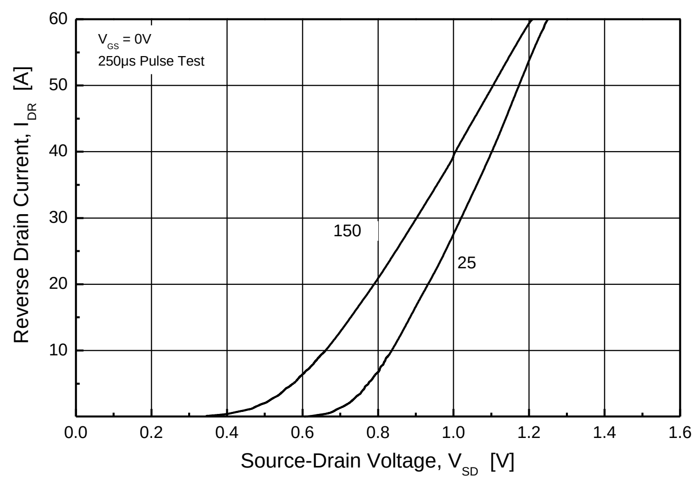
Note :

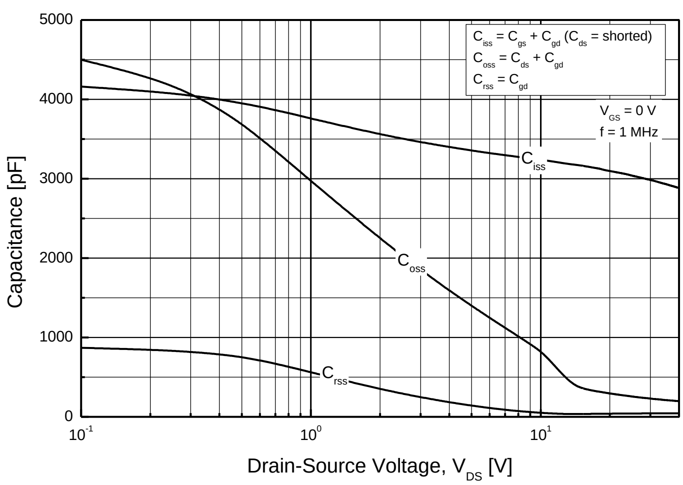
1. Repeated rating : Pulse width limited by safe operating area
2. L=6.2mH, I_{AS} = 16A, V_{DD} = 50V, R_G = 25Ω, Starting T_J= 25 , not subject to production test – verified by design/characterization
3. I_{SD} ≤ 16A, di/dt ≤ 200A/µs , V_{DD} ≤ BV_{DSS}, Starting T_J= 25
4. Pulse Test :Pulse width ≤ 300µs, Duty Cycle ≤ 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

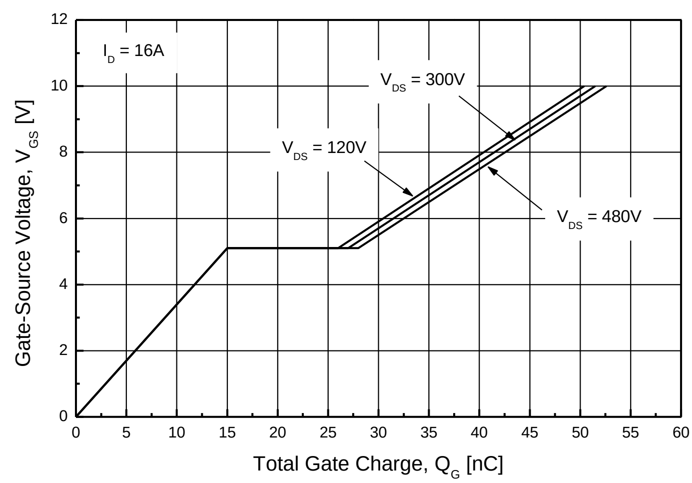

50
45
40
35
30
25
20
15
10
0
0
10
20
30
40

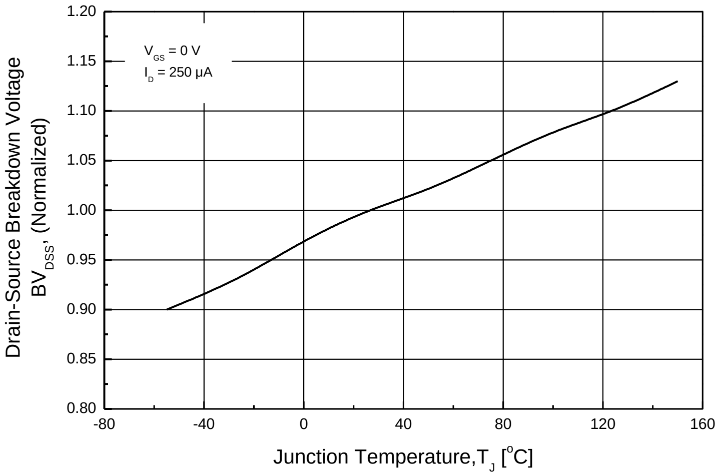

10
0.1

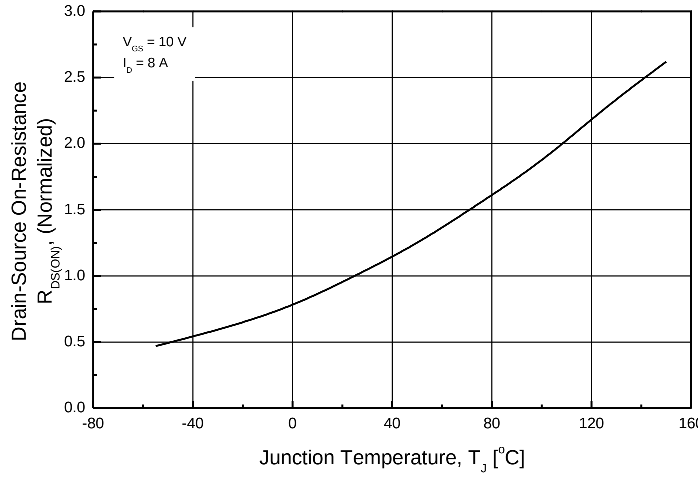

0.8
0.6
0.4
0.2
0.0
0
10
20
30
40
50

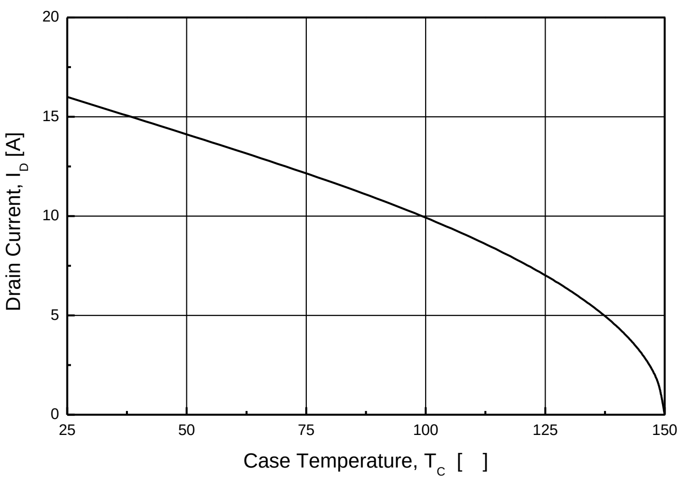

V_GS = 0V
250µs Pulse Test
150
25
Reverse Drain Current, I_DR [A]
Source-Drain Voltage, V_SD [V]

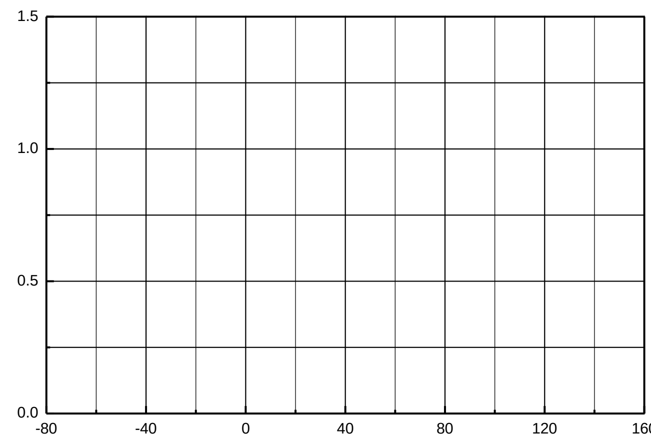

C_iss = C_gs + C_gd (C_ds = shorted)
C_oss = C_ds + C_gd
C_rss = C_gd
V_GS = 0 V
f = 1 MHz
C_iss
C_oss
C_rss
Capacitance [pF]
Drain-Source Voltage, V_DS [V]

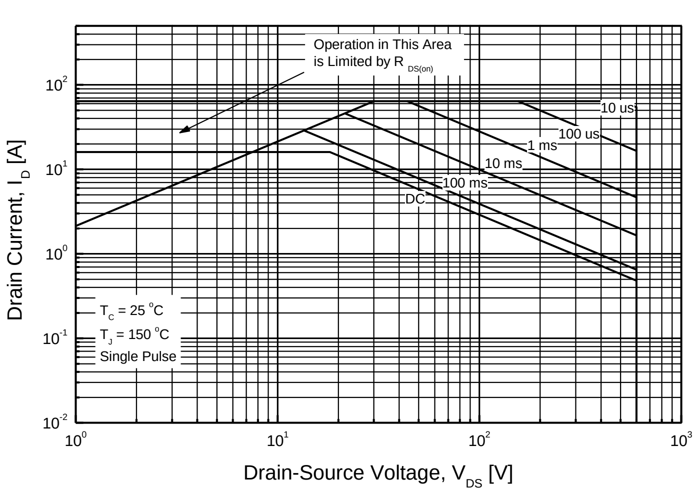

I_D = 16A
V_DS = 300V
V_DS = 120V
V_DS = 480V
Gate-Source Voltage, V_GS [V]
Total Gate Charge, Q_G [nC]

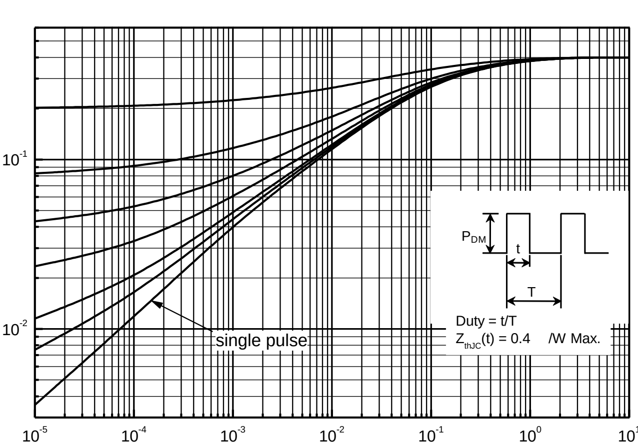

Drain-Source Breakdown Voltage
BVDSS, (Normalized)
VGS = 0 V
ID = 250 µA
1.20
1.15
1.10
1.05
1.00
0.95
0.90
0.85
0.80
-80 -40 0 40 80 120 160
Junction Temperature,TJ [oC]


Drain-Source On-Resistance
RDS(ON), (Normalized)
VGS = 10 V
ID = 8 A
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-80 -40 0 40 80 120 160
Junction Temperature, TJ [oC]

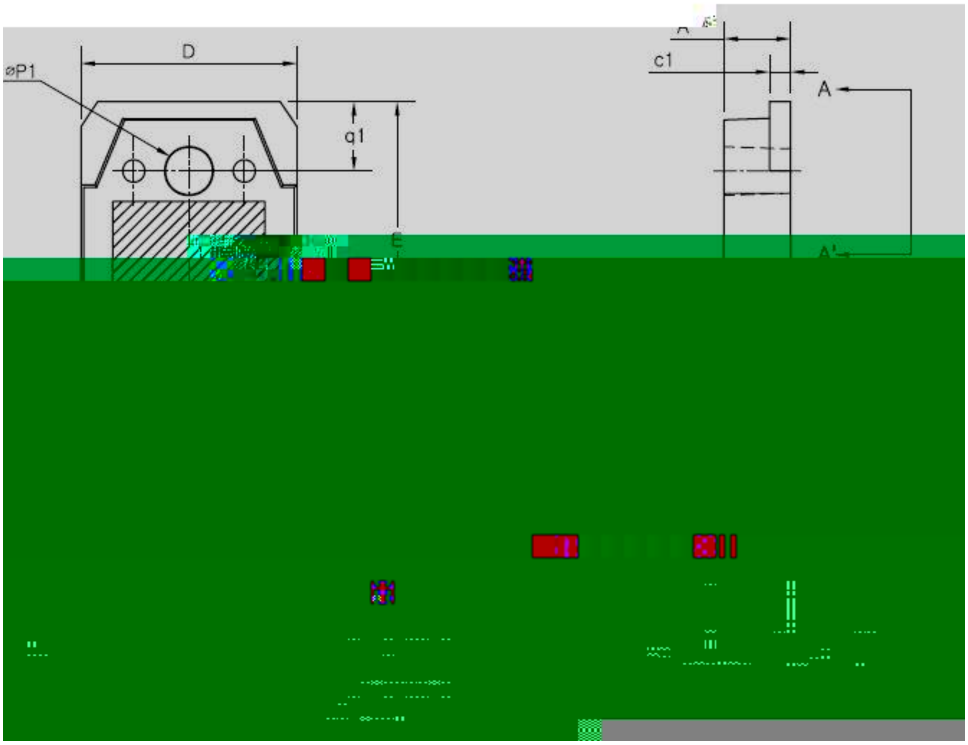

Drain Current, ID [A]
20
15
10
5
0
25 50 75 100 125 150
Case Temperature, TC [ ]

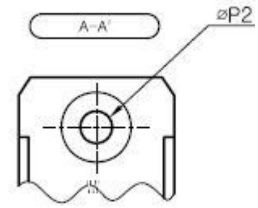

1.5
1.0
0.5
0.0
-80 -40 0 40 80 120 160


Drain Current, ID [A]
Operation in This Area
is Limited by R DS(on)
10 us
100 us
1 ms
10 ms
100 ms
DC
TC = 25 oC
TJ = 150 oC
Single Pulse
10^2
10^1
10^0
10^-1
10^-2
10^0 10^1 10^2 10^3
Drain-Source Voltage, VDS [V]


10^-1
10^-2
PDM
t
T
Duty = t/T
ZthJC(t) = 0.4 /W Max.
single pulse
10^-5 10^-4 10^-3 10^-2 10^-1 10^0 10^1

TO-3PN MECHANICAL DATA





SYMBOL	MIN	NOM	MAX
A	4.60	4.80	5.00
b	0.80	1.00	1.20
b1	1.80	2.00	2.20
b2	2.80	3.00	3.20
c	0.55	0.60	0.75
c1	1.45	1.50	1.65
D	15.40	15.60	15.80
E	19.70	19.90	20.10
e	5.15	5.45	5.75
L1	3.30	3.50	3.70
L2	19.80	20.00	20.20
øP1	3.30	3.40	3.50
øP2		(3.20)	
Q	2.20	2.40	2.60
q1	4.80	5.00	5.20

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