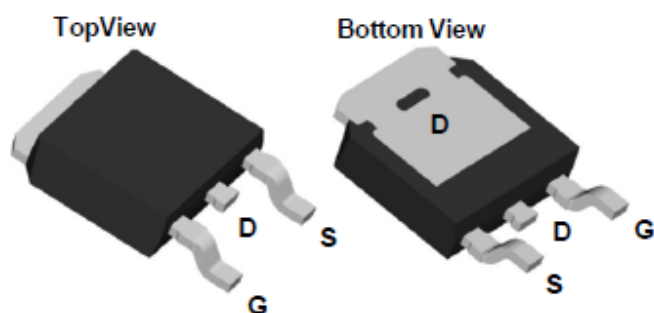


Features

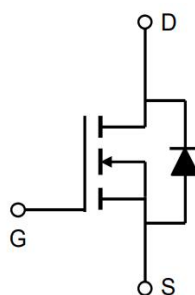
The TW50N10D uses Super Trench technology that is uniquely optimized to provide the most efficient high frequency switching performance. Both conduction and switching power losses are minimized due to an extremely low combination of RDS(ON) and Qg. This device is ideal for high-frequency switching and synchronous rectification.

Product Summary

BVDSS	RDSON	ID
100V	12mΩ	50A



TO-252



Maximum Ratings(Ta=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V _{DS}	100	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current, V _{GS} @10V ¹	I _D @TC=25°C	50	A
Continuous Drain Current, V _{GS} @10V ¹	I _D @TC=100°C	24	
Pulsed Drain Current ①	I _{DM}	180	
Single Pulse Avalanche Energy	E _{AS}	30	mJ
Avalanche Current	I _{AS}	24	A
Power Dissipation ②	P _D	110	W
Thermal Resistance Junction-ambient	R _{θJA}	1.36	°C/W
Thermal Resistance Junction-Case	R _{θJC}	1.36	°C/W
Operating Junction	T _J	-55~+175	°C
Storage Temperature	T _{STG}	-55~+175	°C

Electrical Characteristics(TJ=25 C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static Parameters						
Drain-Source Breakdown Voltage	BV _{DSS}	VGS = 0V, ID = 250μA	100	110		V
Gate Threshold Voltage	VGS(th)	VDS =VGS, ID = 250μA	1.4	2	2.6	V
Gate-Body leakage Current	IGSS	VDS =0V, VGS = ±20V			±100	nA
Zero Gate Voltage Drain Current	IDSS	VDS = 100V, VGS =0V			1	μA
Static Drain-Source On-Resistance	RDS(on)	VGS = 10V, ID = 10A		12	16	mΩ
Dynamic Parameters						
Input Capacitance	Ciss	VDS=15V, VGS=0V, f=1.0MHz		1336		pF
Output Capacitance	Coss			506		pF
Reverse Transfer Capacitance	Crss			44		pF
Total Gate Charge	Qg	VGS = 10V, VDS = 50V, ID=5A		26		nC
Gate Source Charge	Qgs			7.4		nC
Gate Drain Charge	Qgd			3.8		nC
Switching Parameters						
Turn-On DelayTime	td(on)	VGS =10V, VDD =50V, RG = 3Ω, ID= 5		6		ns
Turn-On Rise Time	tr			2		ns
Turn-Off DelayTime	td(off)			18		ns
Turn-Off Fall Time	tf			2		ns
Drain-Source Diode Characteristics and Maximum Ratings						
Maximum Continuous Drain to Source Diode Forward Current		Is			50	A
Drain to Source Diode Forward Voltage	VSD	IS = 28A, VGS = 0V			1.2	V

Note :

1. Repetitive Rating : Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, t < 5 sec.
3. Pulse Test : Pulse Width≤300μs, Duty Cycle ≤ 2%.
4. Guaranteed by design, not subject to production testing.

Typical Electrical and Thermal Characteristics

Typical Electrical and Thermal Characteristics

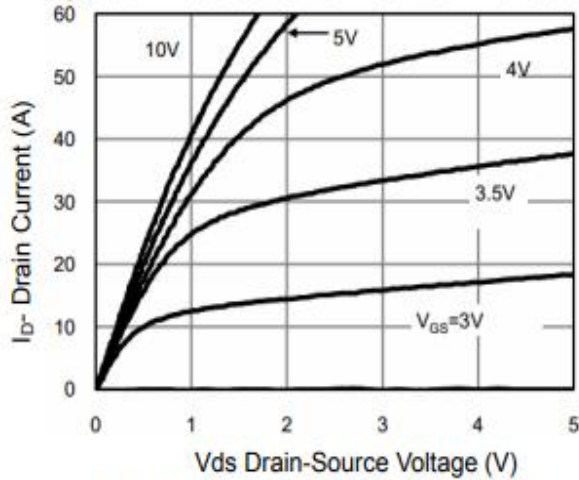


Figure 1 Output Characteristics

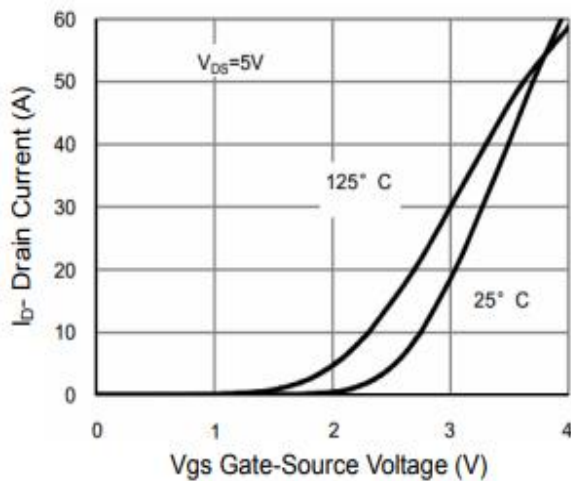


Figure 2 Transfer Characteristics

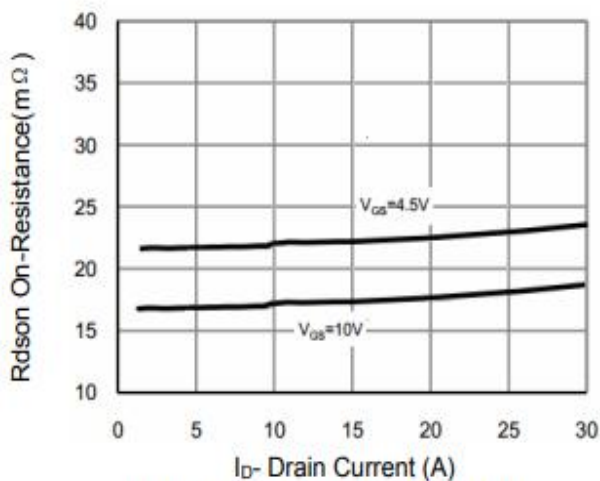


Figure 3 Rdson- Drain Current

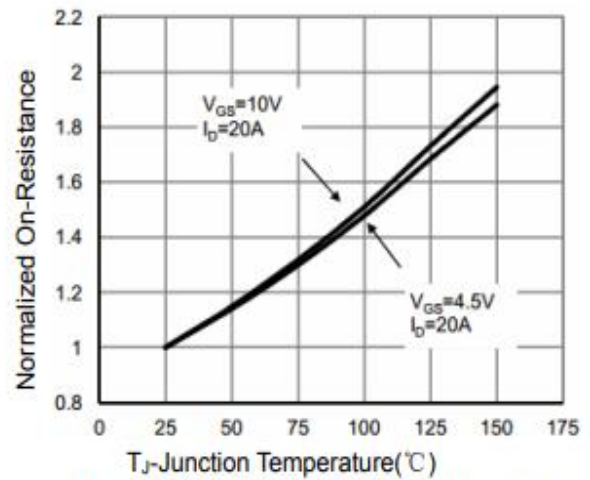


Figure 4 Rdson-Junction Temperature

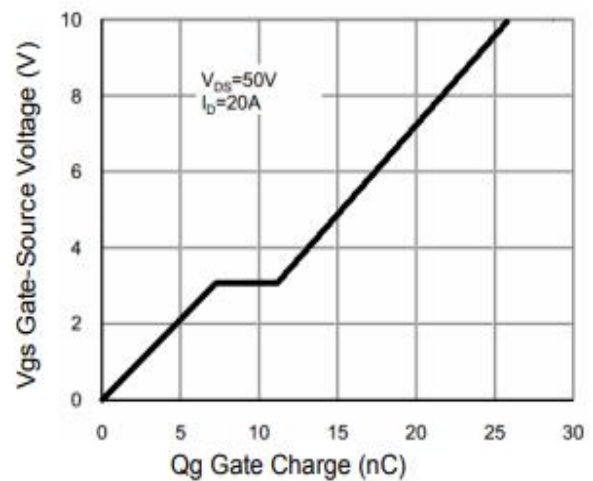


Figure 5 Gate Charge

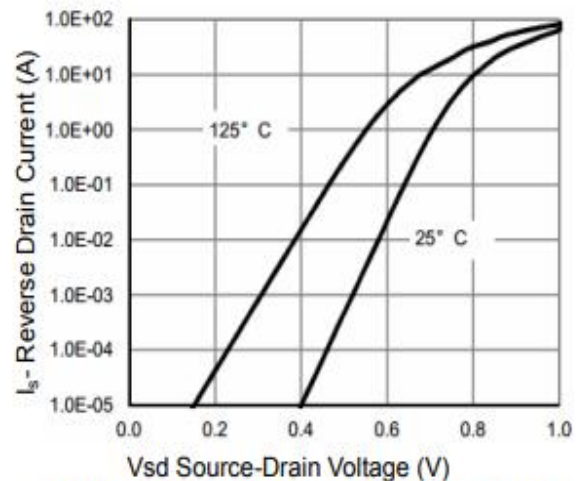


Figure 6 Source- Drain Diode Forward

Typical Electrical and Thermal Characteristics

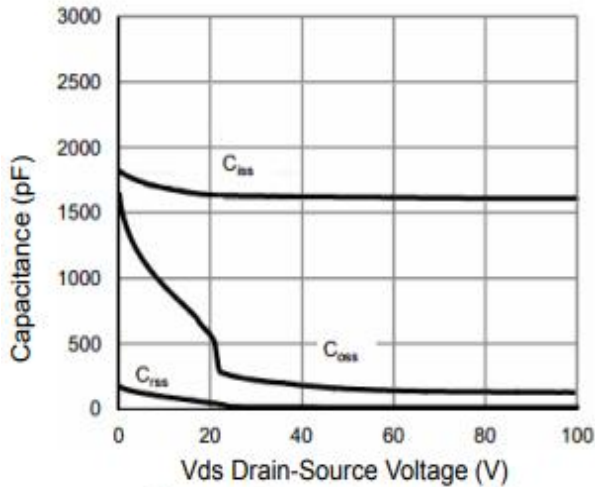


Figure 7 Capacitance vs Vds

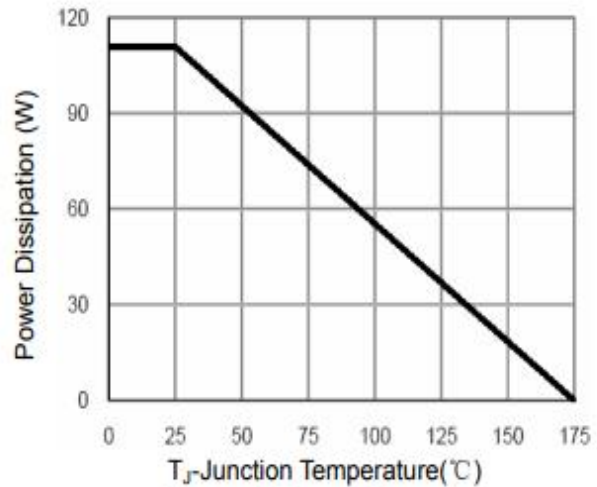


Figure 9 Power De-rating

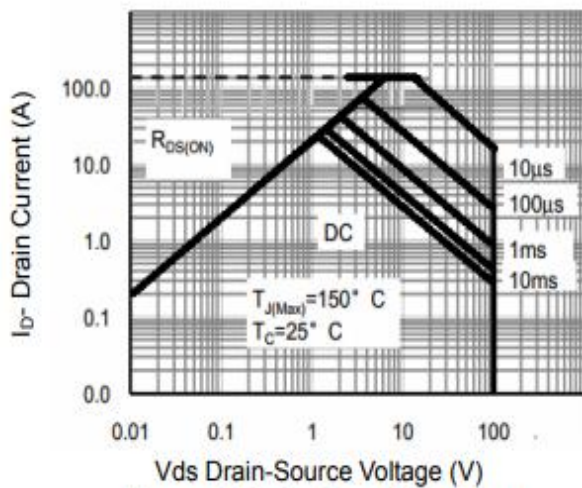


Figure 8 Safe Operation Area

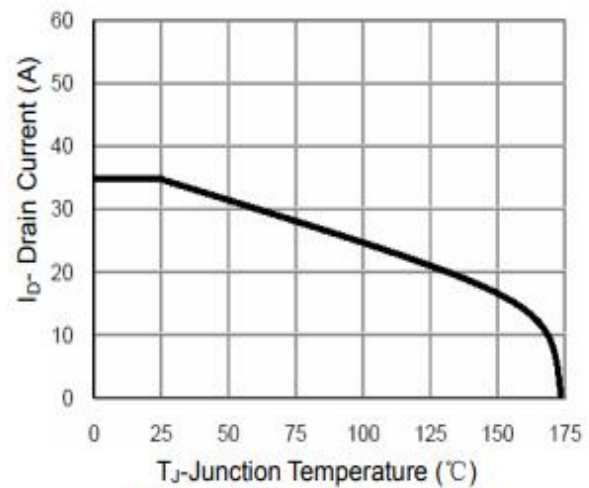


Figure 10 Current De-rating

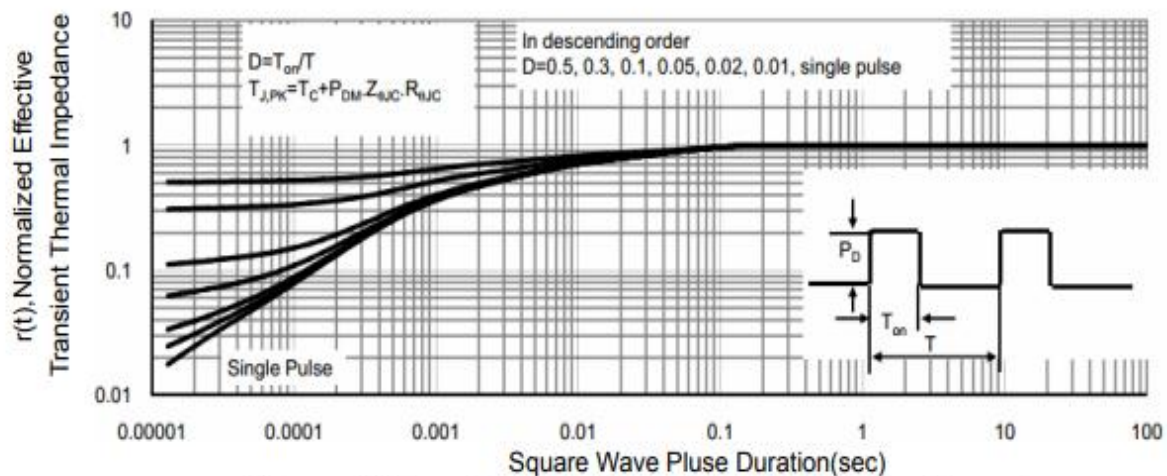
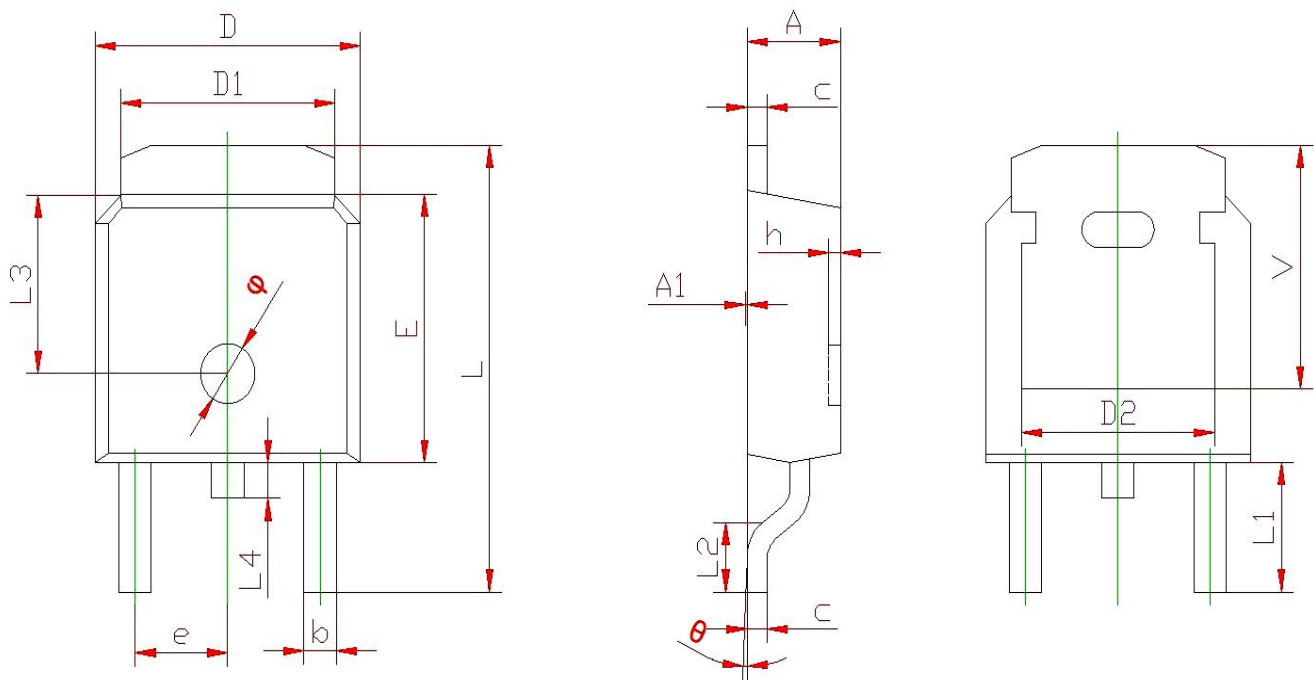


Figure 11 Normalized Maximum Transient Thermal Impedance

TO-252 Package Outline Dimesions


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	4.800 REF		0.189 REF	
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 REF		0.114 REF	
L2	1.400	1.700	0.055	0.067
L3	4.000 REF		0.157 REF	
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	5.5000 REF		0.217 REF	