MSKSEMI
SEMICONDUCTOR

ESD TVS TSS MOV GDT PLED

Product data sheet

Schematic diagram

TO-252

## FEATURE

- High density cell design for ultra low R_{dson}
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation
- Special process technology for high ESD capability

APPLICATION

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply
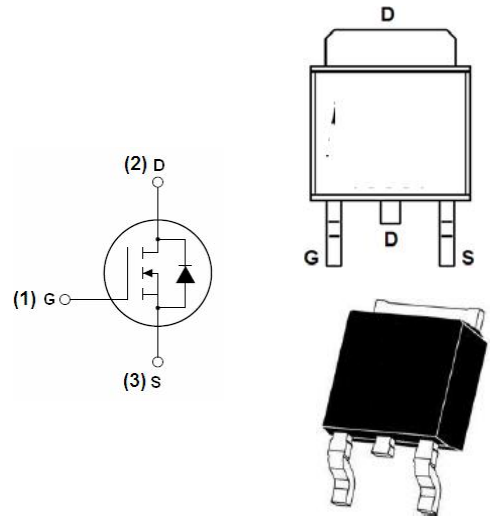
Maximum ratings (T$_a$=25℃ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	
Continuous Drain Current	I_D	50	A
Pulsed Drain Current	I_{DM}	220	
Single Pulsed Avalanche Energy*	E_{AS}	115	mJ
Power Dissipation	P_D	1.25	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	100	℃/W
Junction Temperature	T_J	150	℃
Storage Temperature	T_{stg}	-50 ~+150	

*E_{AS} condition: T_j=25℃,V_{DD}=50V,L=0.5mH, R_G=25Ω, Starting T_J = 25°C

Electrical characteristics (T$_a$=25℃ unless otherwise noted)

| Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	V$_{(BR) DSS}$	V$_{GS}$ = 0V, I$_D$ =250μA	60			V
Zero gate voltage drain current	I$_{DSS}$	V$_{DS}$ =60V, V$_{GS}$ =0V			1	μA
Gate-body leakage current	I$_{GSS}$	V$_{DS}$ =0V, V$_{GS}$ =±20V			±100	nA
On characteristics (note1)						
Gate-threshold voltage	V$_{GS(th)}$	V$_{DS}$ =V$_{GS}$, I$_D$ =250μA	1.5		2.5	V
Static drain-source on-resistance	R$_{DS(on)}$	V$_{GS}$ =10V, I$_D$ =20A		11.5	15	mΩ
Forward transconductance	g$_{FS}$	V$_{DS}$ =25V, I$_D$ =20A	24			S
Dynamic characteristics (note 2)						
Input capacitance	C$_{iss}$	V$_{DS}$ =25V,V$_{GS}$ =0V, f =1MHz		900		pF
Output capacitance	C$_{oss}$			104		
Reverse transfer capacitance	C$_{rss}$			33		
Switching characteristics (note 2)						
Total gate charge	Q$_g$	V$_{DS}$=30V, V$_{GS}$=10V, I$_D$=50A		30		nC
Gate-source charge	Q$_{gs}$			10		
Gate-drain charge	Q$_{gd}$			5		
Turn-on delay time	t$_{d(on)}$	V$_{DD}$=30V,I$_D$=2A, V$_{GS}$=10V,R$_G$=2.5Ω, R$_L$=15Ω		25		ns
Turn-on rise time	t$_r$			5		
Turn-off delay time	t$_{d(off)}$			50		
Turn-off fall time	t$_f$			6		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note1)	V$_{SD}$	V$_{GS}$ =0V, I$_S$=40A			1.2	V
Continuous drain-source diode forward current	I$_S$				50	A
Pulsed drain-source diode forward current	I$_{SM}$				220	A

Notes:

1.   Pulse Test : Pulse Width≤300μs, duty cycle ≤2%.

2.   Guaranteed by design, not subject to production.

PACKAGE MECHANICAL DATA
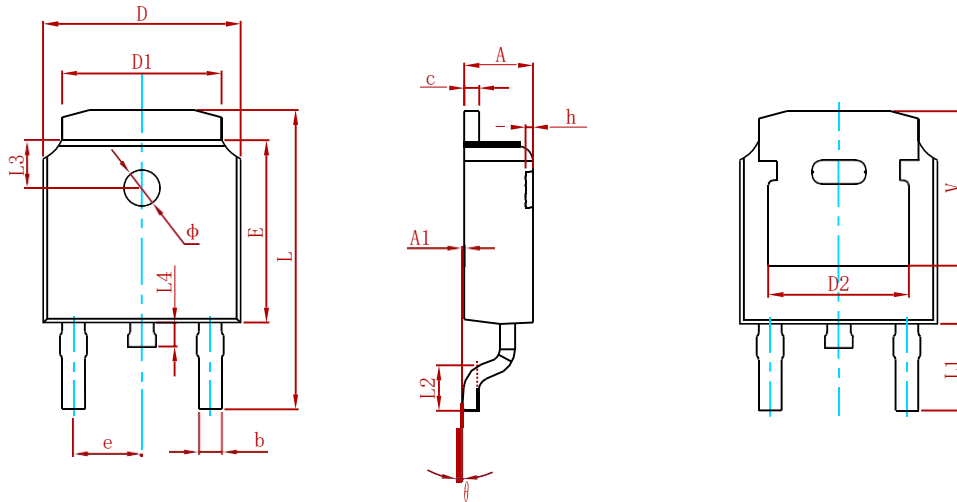
Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 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	5.250 REF.		0.207 REF.	

Suggested Pad Layout
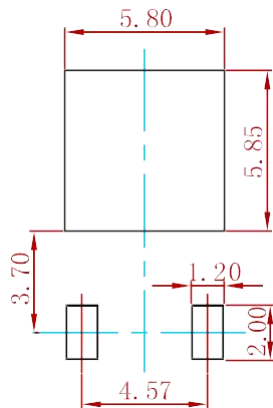
Note:
1. Controlling dimension:in millimeters.
2. General tolerance:± 0.05mm.
3. The pad layout is for reference purposes only.

REEL SPECIFICATION

P/N	PKG	QTY
MS50N06	TO-252	2500

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