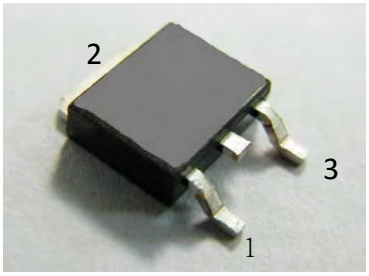
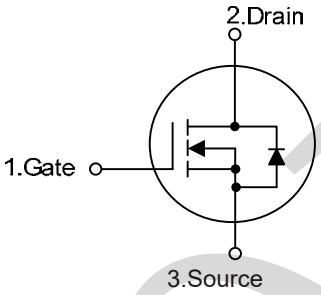
Trench N-channel Power MOSFET

MSR4R6N03D

TO-252





V_{DS}	30	V
$R_{DS(on),TYP}$@ V_{GS}=10 V	3.0	mΩ
I_D	80	A

Features

1、Low on – resistance

2、Package TO-252

3、TrenchFET Power MOSFET

Applications

1、Load Switch for Portable Devices

2、DC/DC Converter

Maximum ratings, at TA =25°C, unless otherwise specified

Symbol	Parameter		Rating	Unit
V(BR)DSS	Drain-Source breakdown voltage		30	V
VGS	Gate-Source voltage		±20	V
IS	Diode continuous forward current	T_C =25°C	--	A
ID	Continuous drain current @VGS=10V	T_C =25°C	80	A
		T_C =100°C	60	A
IDM	Pulse drain current tested ①	T_C =25°C	300	A
EAS	Avalanche energy, single pulsed ②		52	mJ
PD	Maximum power dissipation	T_C =25°C	85	W
TSTG,TJ	Storage and Junction Temperature Range		-55 to 150	°C

Thermal Characteristics

Symbol	Parameter	Typical	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	2.1	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	62	°C/W

Electrical Characteristics

Symbol	Parameter	Condition	Min.	Typ.	Max.	Unit
Static Electrical Characteristics @Tj=25°C (unless otherwise stated)						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=30V,V_{GS}=0V	--	--	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V	--	--	±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=250μA	1.0	--	2.5	V
$R_{DS(on)}$	Drain-Source On-State Resistance ④	V_{GS}=10V, I_D=30A	--	3.0	4.5	mΩ
		V_{GS}=4.5V, I_D=20A	--	5.0	8.0	mΩ

Dynamic Electrical Characteristics@Tj = 25°C (unless otherwise stated)

C_{iss}	Input Capacitance	V_{DS}=15V,V_{GS}=0V , f=1MHz	--	2200	--	pF
C_{oss}	Output Capacitance		--	311	--	pF
C_{rss}	Reverse Transfer Capacitance		--	210	--	pF
gfs	Forward Transconductance	VDS = 5 V, ID = 10 A	20	--	--	S
Q_g (10V)	Total Gate Charge	V_{DS}=15V,I_D=30A , V_{GS}=10V	--	51	--	nC
Q_{gs}	Gate-Source Charge		--	14	--	nC
Q_{gd}	Gate-Drain Charge		--	11	--	nC

Switching Characteristics

Td(on)	Turn-on Delay Time	V_{DS}=15V, VGS=10V, R_G=3.0Ω, I_D=30A	--	20	--	ns
Tr	Turn-on Rise Time		--	15	--	ns
Td(off)	Turn-Off Delay Time		--	60	--	ns
Tf	Turn-Off Fall Time		--	10	--	ns

Source-Drain Diode Characteristics @Tj = 25°C (unless otherwise stated)

V_{SD}	Forward on voltage	I_{SD}=1A,V_{GS}=0V	--	--	1.2	V
I_S	Maximun Body-Diode Continuous Current		--	--	80	A
I_{SM}	Maximun Body-Diode Pulsed Current(Note 4)		--	--	300	A

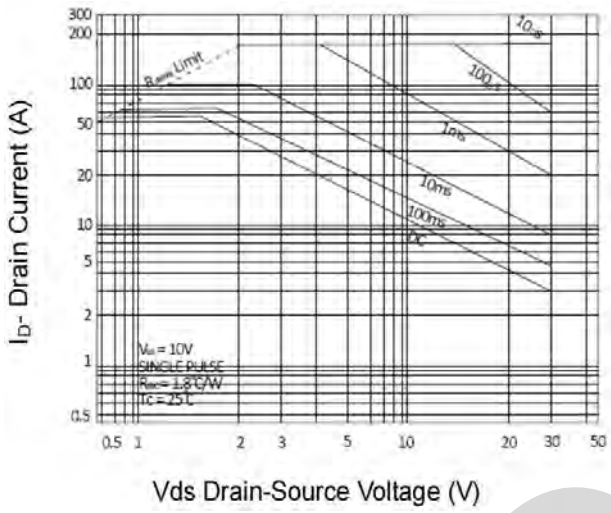
NOTE: ① Repetitive rating; pulse width limited by max junction temperature.

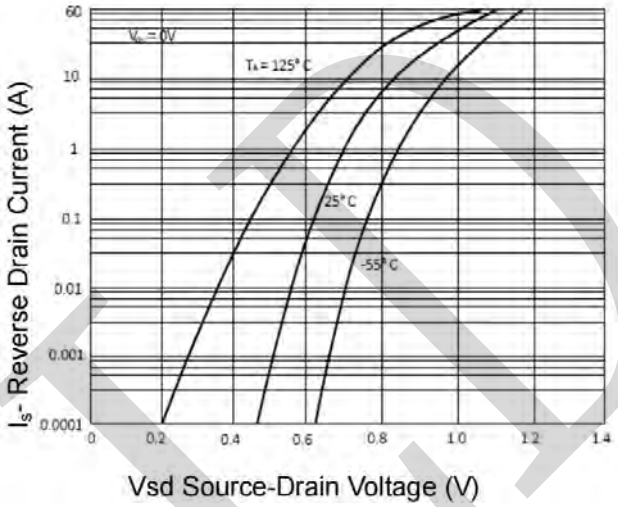
② Limited by T_{Jmax}, starting T_J = 25°C, L = 0.5mH, R_G = 25Ω, I_{AS} = 9A, V_{GS} =10V. Part not recommended for use above this value

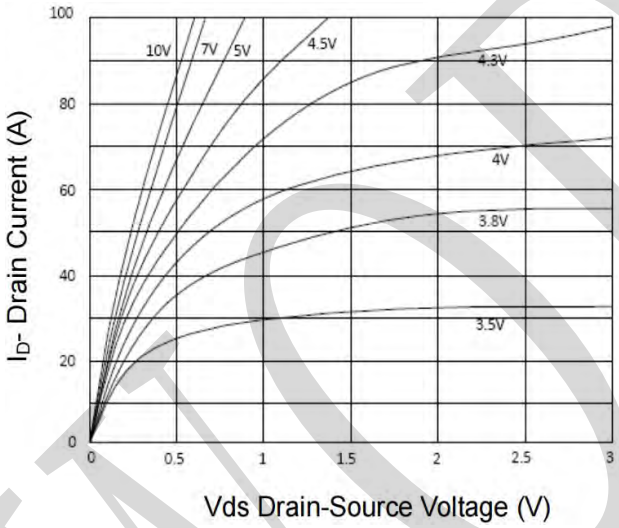
③ The power dissipation P_{DSM} is based on $R_{\theta JA}$ and the maximum allowed junction temperature of 150°C.

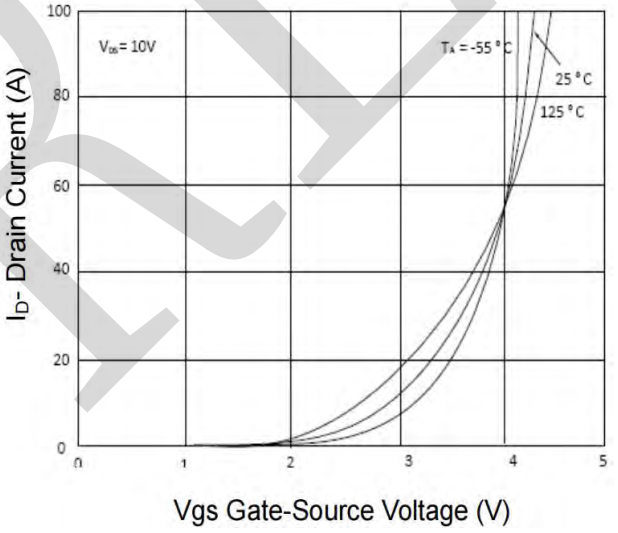
④ Pulse width ≤ 300μs; duty cycle≤ 2%.

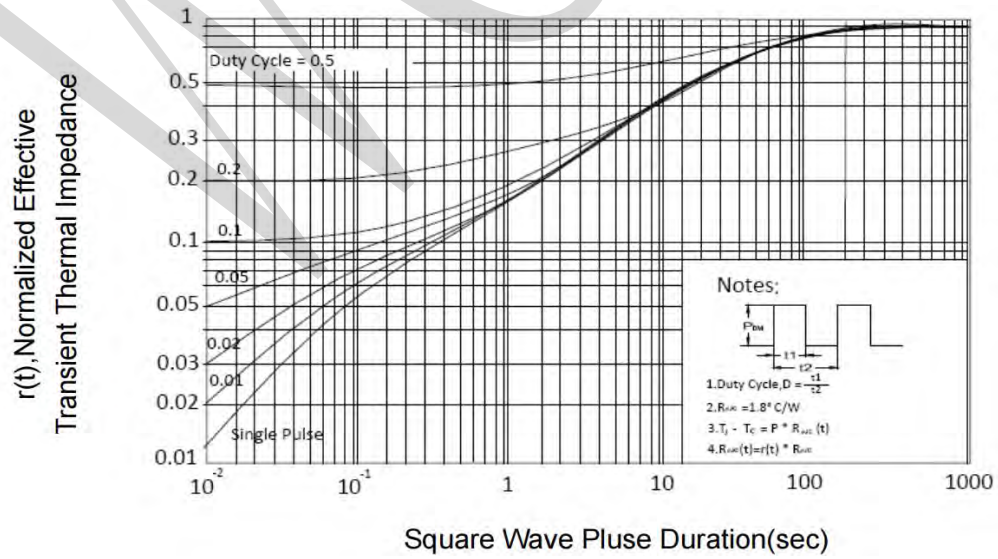
Typical Characteristics



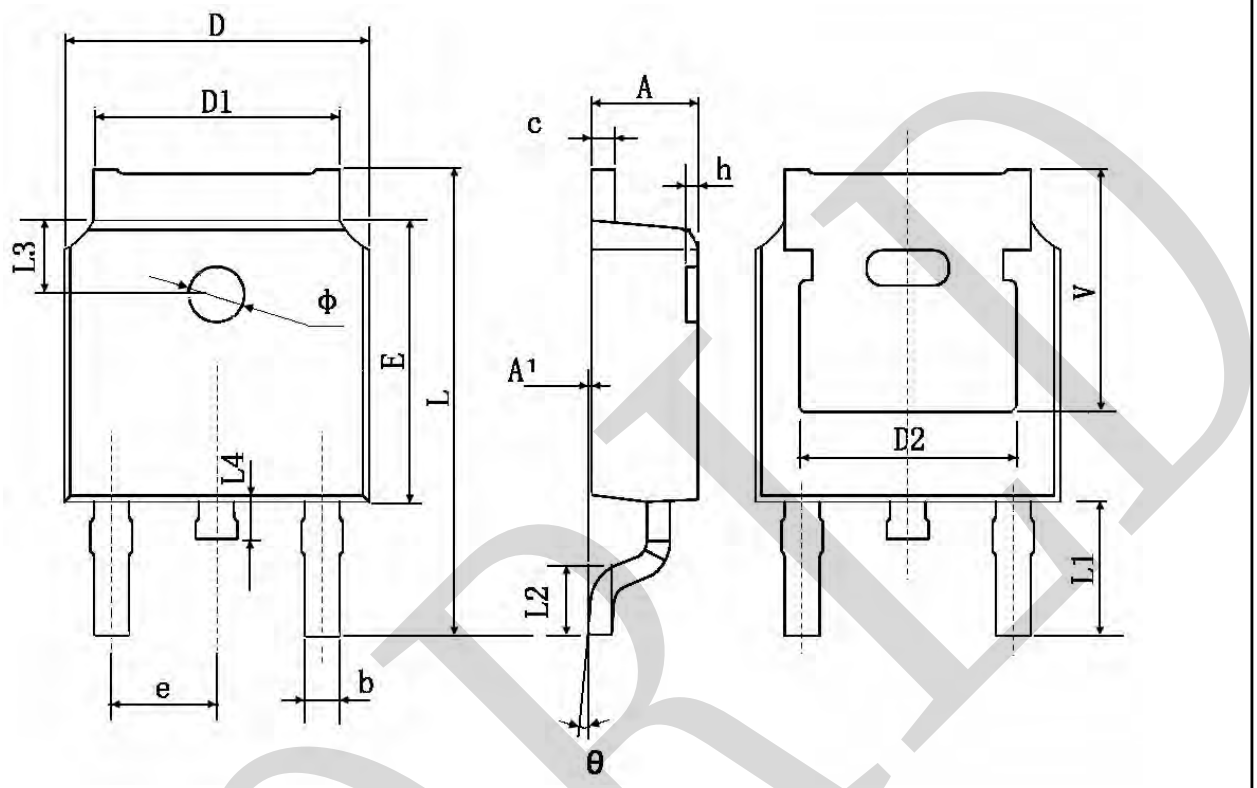








PACKAGE OUTLINE DIMENSIONS



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	4.830TYP.		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.	