

General Description

These N-channel enhancement mode power mosfets used advanced trench technology design, provided excellent $R_{DS(on)}$ and low gate charge. Which accords with the RoHS standard.

Features

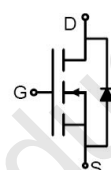
- $V_{DS} = 30V, I_D = 95A$
 $R_{DS(on)}, 4.1 m\Omega (Typ) @ V_{GS} = 10V$
 $R_{DS(on)}, 7.1 m\Omega (Typ) @ V_{GS} = 4.5V$
- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

Application

- Power switching application
- Hard switched and high frequency circuits
- Uninterruptible power supply



TO-252(DPAK) top view



Schematic Diagram

Absolute Maximum Ratings($T_A = 25^\circ C$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	± 20	V
Drain Current-Continuous	$TC = 25^\circ C$	I_D	95	A
	$TC = 100^\circ C$		67.2	A
Drain Current-Pulsed ^{Note1}		I_{DM}	380	A
Avalanche Energy ^{Note5}		E_{AS}	150	mJ
Maximum Power Dissipation	$TC = 25^\circ C$	P_D	100	W
Storage Temperature Range		T_{STG}	-55 to +150	$^\circ C$
Operating Junction Temperature Range		T_J	-55 to +150	$^\circ C$

Thermal Resistance

Parameter	Symbol	Min.	Typ.	Max	Unit
Thermal Resistance, Junction-to-Case ^{Note2}	$R_{\theta JC}$	-	1.5	-	$^\circ C/W$

Electrical Characteristics(T_J=25℃ unless otherwise noted)

OFF CHARACTERISTICS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _{DS} =250uA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V	-	-	1	uA
Gate-Body Leakage	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA

ON CHARACTERISTICS ^{Note3}						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _{DS} =250uA	1.0	1.5	2.2	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _{DS} =20A	-	4.1	5.1	mΩ
		V _{GS} =4.5V, I _{DS} =15A	-	7.1	8.5	
Forward Transconductance	g _{FS}	V _{DS} =5V, I _D =20A	30	-	-	S

DYNAMIC CHARACTERISTICS ^{Note4}						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f=1MHz	-	1784	-	pF
Output Capacitance	C _{oss}		-	266	-	
Reverse Transfer Capacitance	C _{rss}		-	212	-	

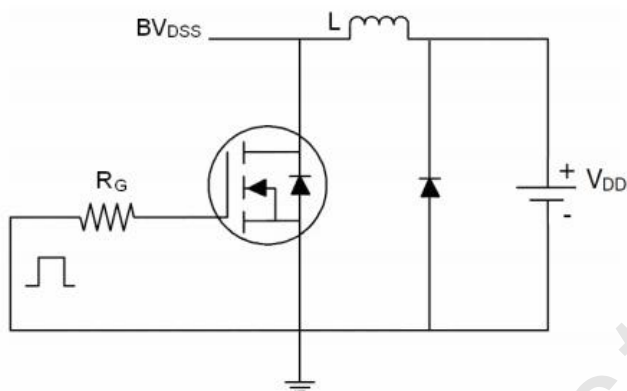
SWITCHING CHARACTERISTICS ^{Note4}						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Turn-On Delay Time	T _{d(on)}	V _{GS} =10V, V _{DS} =5V, R _{GEN} =6Ω I _D =20A	-	7	-	ns
Rise Time	t _r		-	6	-	
Turn-Off Delay Time	T _{d(off)}		-	30	-	
Fall Time	t _f		-	8	-	
Total Gate Charge at 10V	Q _g	V _{DS} =15V, I _{DS} =20A, V _{GS} =10V	-	38.4	-	nC
Gate to Source Gate Charge	Q _{gs}		-	5.8	-	
Gate to Drain"Miller"Charge	Q _{gd}		-	7.9	-	

DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS						
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain-Source Diode Forward Voltage ^{Note3}	V _{SD}	V _{GS} =0V, I _{DS} =20A	-	0.85	1.2	V
Diode Forward Current ^{Note 2}	I _S		-	-	95	A
Reverse Recovery Time	t _{rr}	T _J =25℃, I _F =20A	-	-	47	nS
Reverse Recovery Charge	Q _{rr}	di/dt=100A/us ^{Note3}	-	-	25	nC

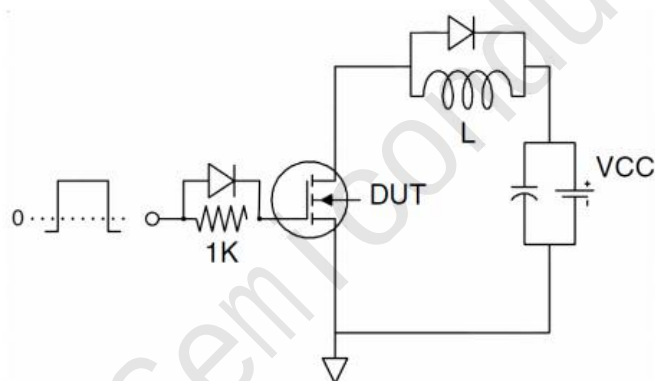
- Notes:**
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
 2. Surface Mounted on FR4 Board, t ≤ 10 sec.
 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
 4. Guaranteed by design, not subject to production
 5. EAS condition: T_J=25℃, V_{DD}=15V, V_G=10V, L=0.5mH, R_g=25Ω

Test Circuit

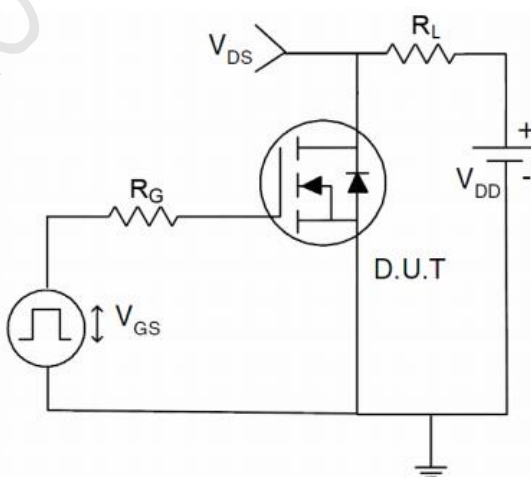
1) E_{AS} Test Circuits

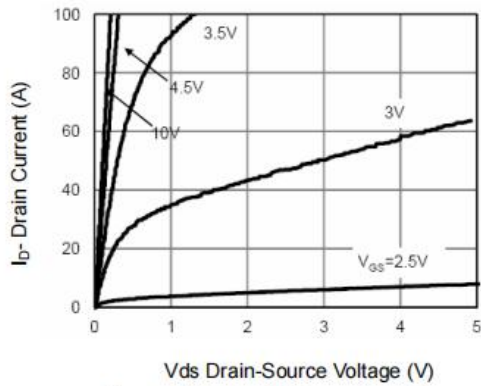
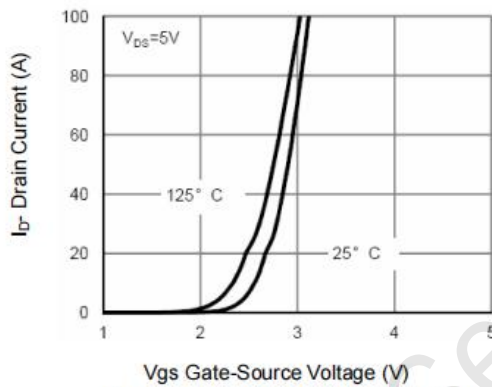
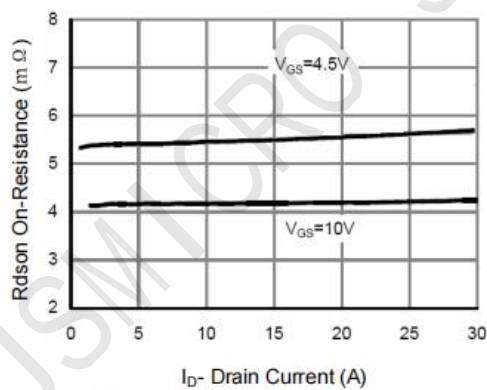
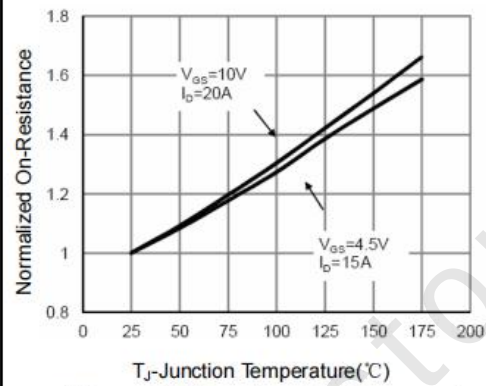
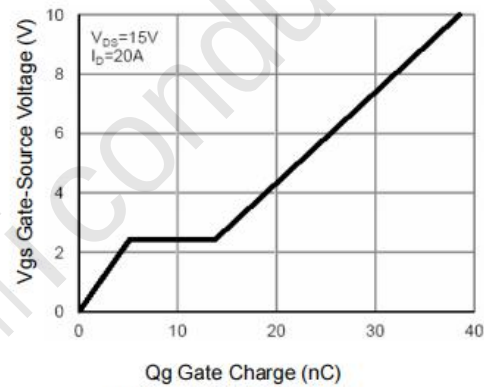
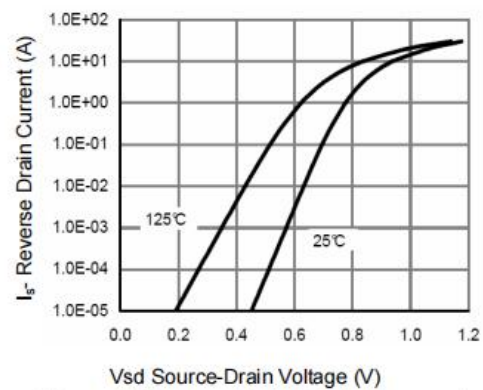


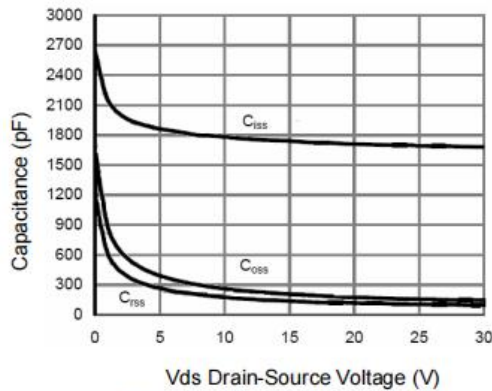
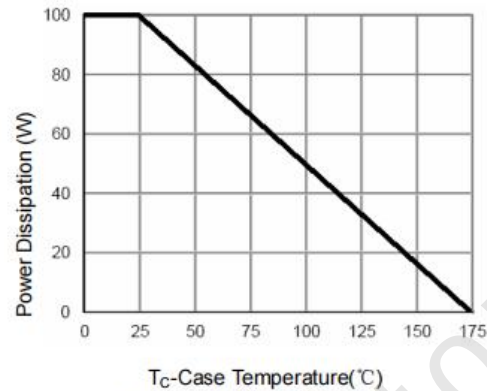
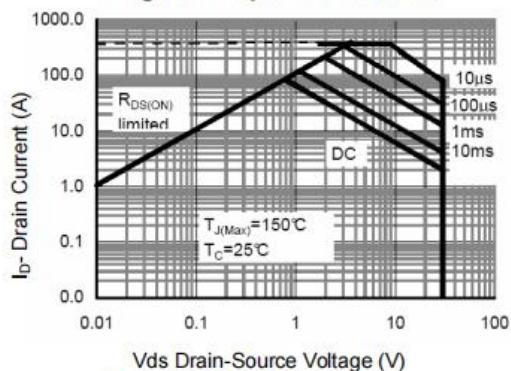
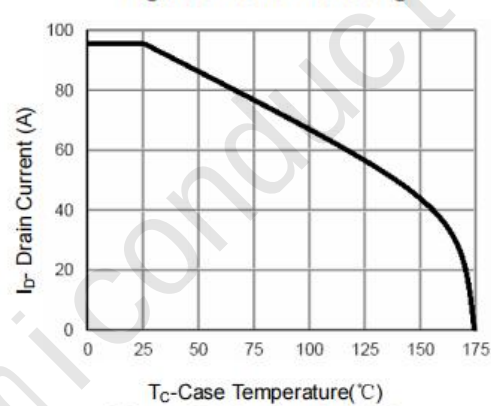
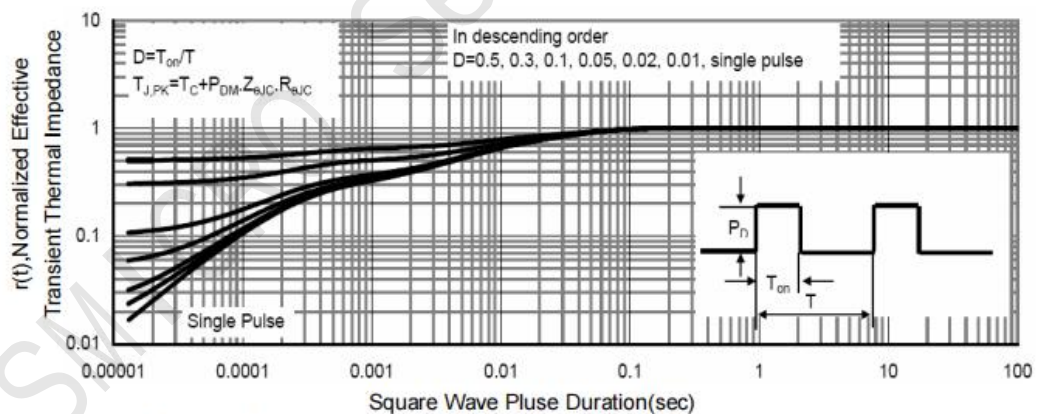
2) Gate Charge Test Circuit

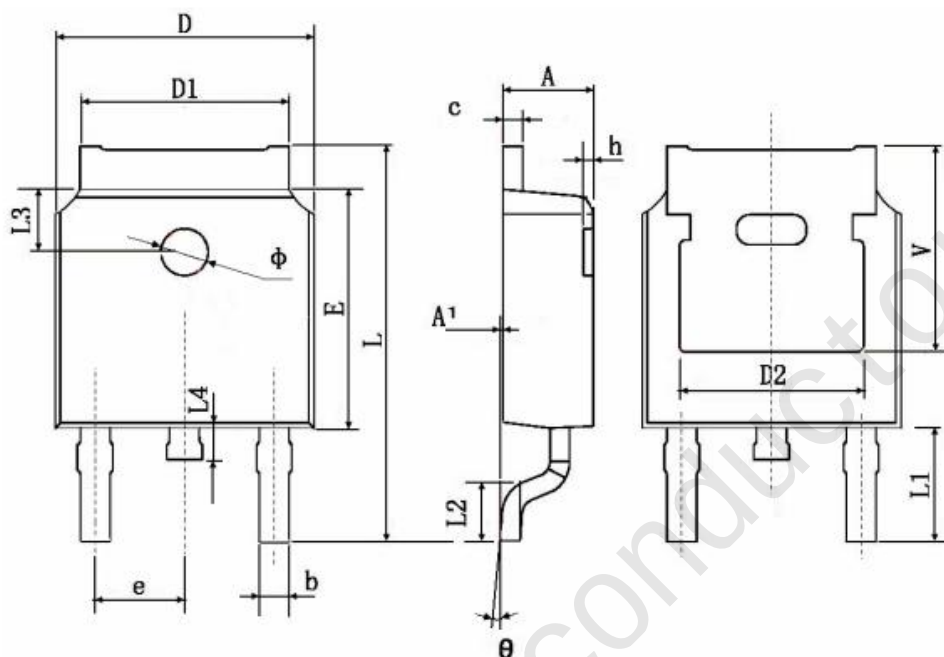


3) Switch Time Test Circuit



Typical Electrical and Thermal Characteristics (Curves)

Figure 1 Output Characteristics

Figure 2 Transfer Characteristics

Figure 3 $R_{DS(on)}$ - Drain Current

Figure 4 $R_{DS(on)}$ - Junction Temperature

Figure 5 Gate Charge

Figure 6 Source- Drain Diode Forward


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 Information


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	4.830 TYP.		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.	