

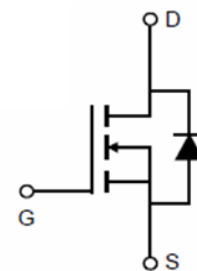
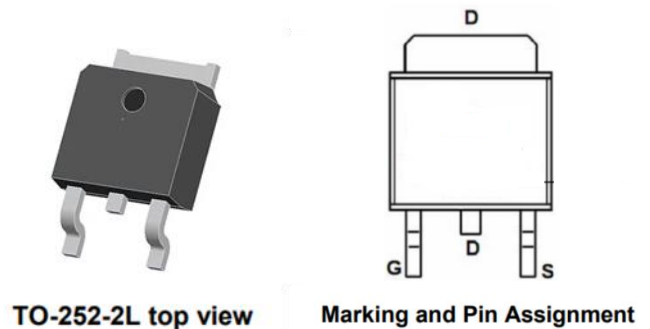
Description

This Power MOSFET is produced using advanced TRENCH technology.

This advanced technology has been especially tailored to minimize conduction loss, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode.

Features

- $V_{DS}=30V$, $I_D=90A$
- $R_{DS(ON) TYP} = 3.6m\Omega @ V_{GS} = 10V$
- $R_{DS(ON) TYP} = 5.2m\Omega @ V_{GS} = 4.5V$
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



Schematic diagram

Applications

- PWM Application
- Load Switch
- Power Management

Absolute Maximum Ratings

Parameter		Symbol	Value	Unit
Drain-source Voltage		V_{DS}	30	V
Gate-source Voltage		V_{GS}	± 20	V
Continuous Drain Current	$T_C=25^{\circ}\text{C}$	I_D	90	A
	$T_C=100^{\circ}\text{C}$		58	
Pulsed Drain Current($T_C=25^{\circ}\text{C}$, T_p Limited By T_{jmax}) ^(note1)		I_{DM}	360	A
Maximum Power Dissipation($T_C=25^{\circ}\text{C}$)		P_D	90	W
Avalanche energy , single Pulse($L=0.5\text{mH}$) ^(note2)		E_{AS}	90	mJ
Operating Junction And Storage Temperature		T_j, T_{stg}	-55 To 150	$^{\circ}\text{C}$
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds		T_L	300	$^{\circ}\text{C}$

Thermal Resistance

Parameter	Symbol	Max	Unit
Junction-to-Case	$R_{\theta JC}$	1.67	$^{\circ}\text{C/W}$

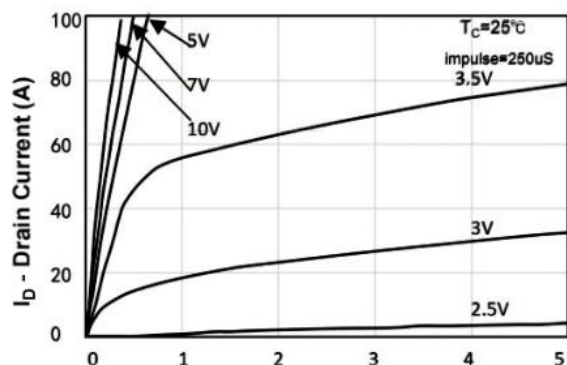
Note:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: $T_J = 25^{\circ}\text{C}$, $V_{DD} = 15\text{V}$, $V_G = 10\text{V}$, $R_G = 25\Omega$, $L = 0.5\text{mH}$, $I_{AS} = 19\text{A}$
3. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 0.5\%$

Electrical Characteristic (TC=25°C unless otherwise noted)

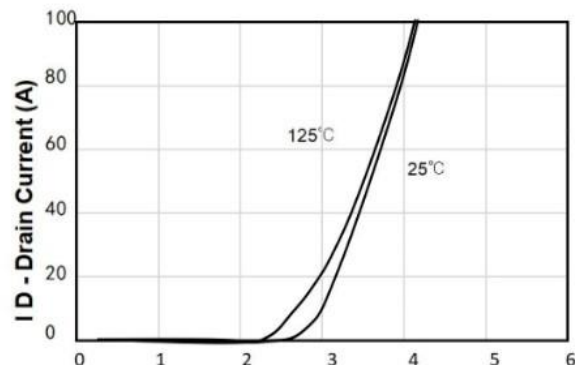
Parameter	Symbol	Value			Unit	Test Condition
		Min.	Typ.	Max.		
Off Characteristic						
Drain-source breakdown voltage	BV _{DSS}	30	-	-	V	V _{GS} =0V, I _D =250μA
Zero gate voltage drain current	I _{DSS}	-	-	1	μA	V _{DS} =30V, V _{GS} =0V
		-	-	10	μA	V _{DS} =24V, TC =125℃
Gate-source leakage current	I _{GSS}	-	-	± 100	nA	V _{GS} =± 20V, V _{DS} =0V
On Characteristics						
Gate threshold voltage	V _{GS(th)}	1.0	1.5	2.5	V	V _{DS} =V _{GS} , I _D =250μA
Drain-source on-state resistance	R _{DS(on)}	-	3.6	4.5	mΩ	V _{GS} =10V, I _D =30A
		-	5.2	7.0	mΩ	V _{GS} =4.5V, I _D =20A
Dynamic Characteristic						
Input Capacitance	C _{iss}	-	2300	-	PF	V _{GS} =0V, V _{DS} =15V, f=1.0MHz
Output Capacitance	C _{oss}	-	268	-		
Reverse Transfer Capacitance	C _{rss}	-	227	-		
Switching Characteristics						
Turn-on delay time	t _{d(on)}	-	13	-	nS	V _{DD} =30V, I _D =25A, R _G =25Ω
Turn-on Rise time	t _r	-	36	-		
Turn-off delay time	t _{d(off)}	-	43	-		
Turn-off Fall time	t _f	-	16	-		
Gate Total Charge	Q _G	-	42	-	nC	V _{GS} =10V, V _{DS} =15V, I _D =30A
Gate-Source Charge	Q _{gS}	-	4	-		
Gate-Drain Charge	Q _{gd}	-	14	-		
Drain-Source Diode Characteristics						
Body Diode Forward Voltage	V _{SD}	-	-	1.2	V	V _{GS} =0V, I _{SD} =30A
Body Diode Forward Current	I _S	-	-	90	A	-
Body Diode Reverse Recovery Time	T _{rr}	-	16	-	ns	T _J =25℃, I _{SD} =20A, V _{GS} =0V, di/dt =100A/μs
Body Diode Reverse Recovery Charge	Q _{rr}	-	5	-	nC	

N- Channel Typical Characteristics



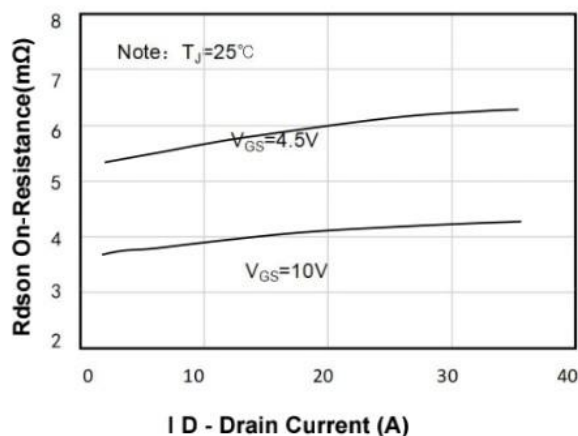
Vds Drain-Source Voltage (V)

Figure 1. On-Region Characteristics



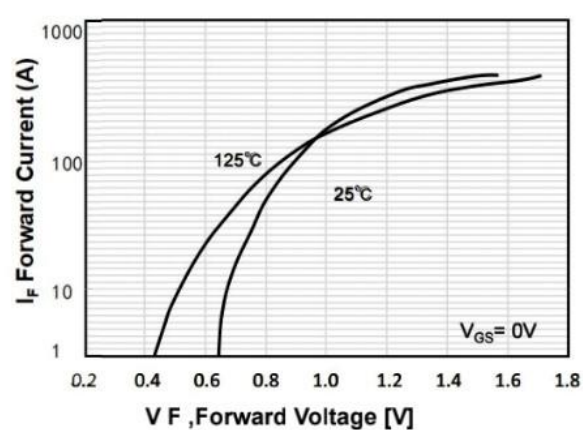
Vgs Gate-Source Voltage (V)

Figure 2. Transfer Characteristics



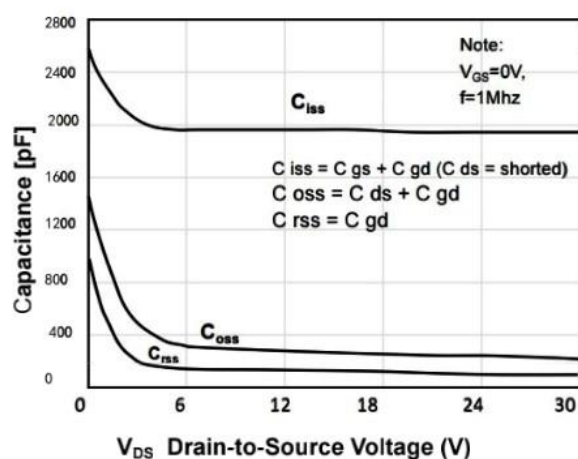
ID - Drain Current (A)

Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage



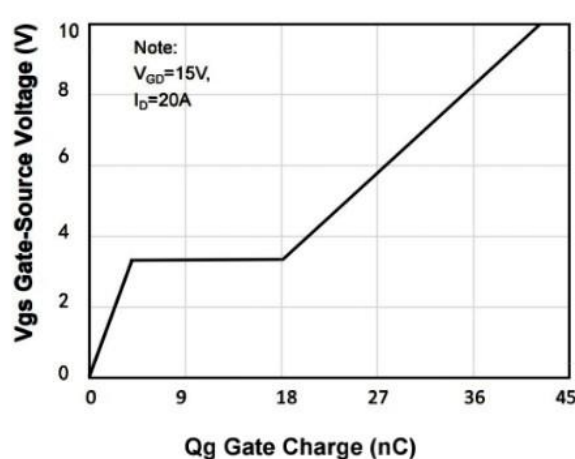
VF ,Forward Voltage [V]

Figure 4. Body Diode Forward Voltage Variation with Source Current and Temperature



VDS Drain-to-Source Voltage (V)

Figure 5. Capacitance Characteristics



Qg Gate Charge (nC)

Figure 6. Gate Charge Characteristics

N- Channel Typical Characteristics (Continued)

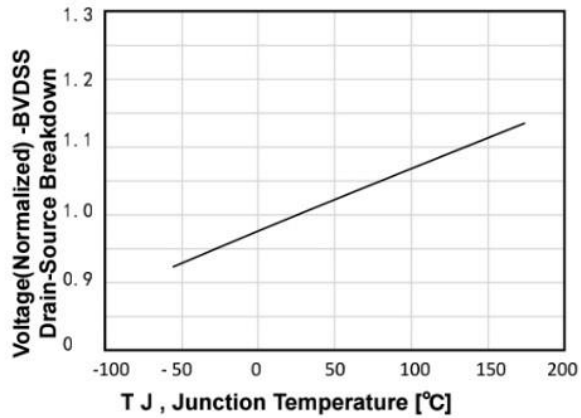


Figure 7. Breakdown Voltage Variation vs Temperature

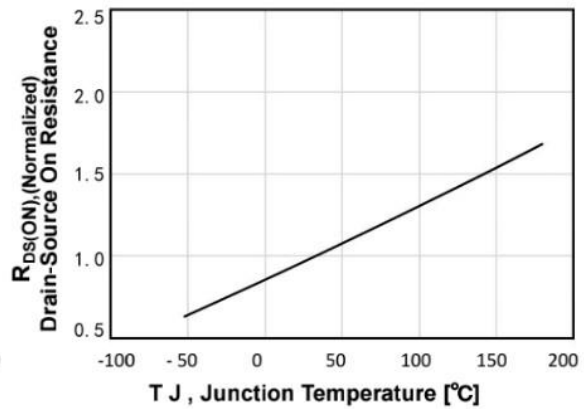


Figure 8. On-Resistance Variation vs Temperature

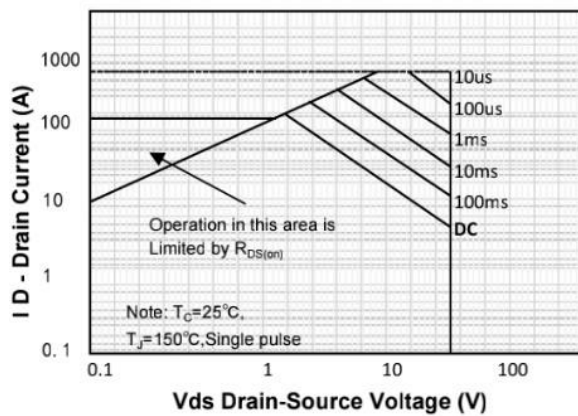


Figure 9. Maximum Safe Operating Area

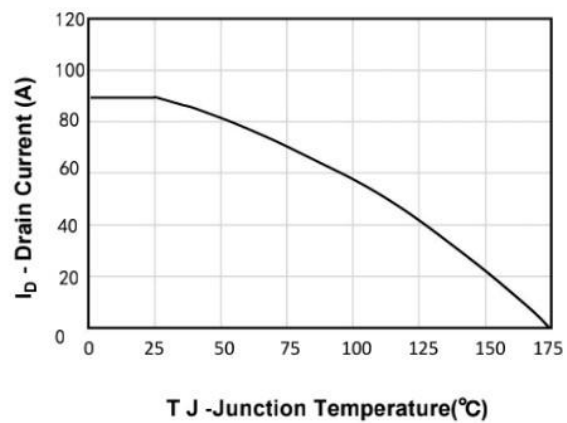


Figure 10. Maximum PContinuous Drain Current vs Case Temperature

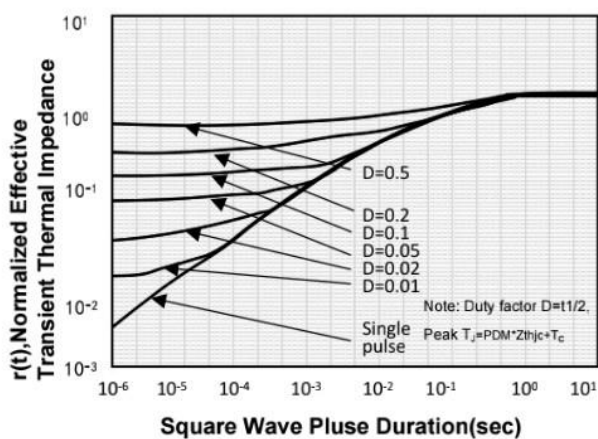
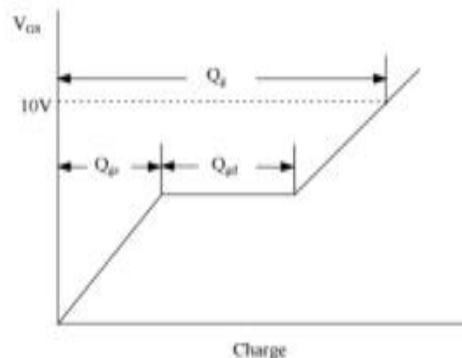
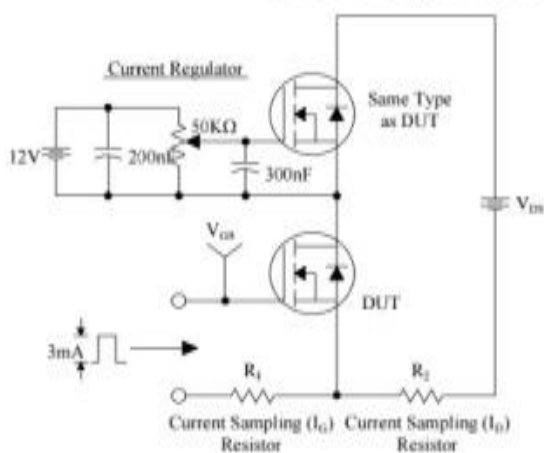
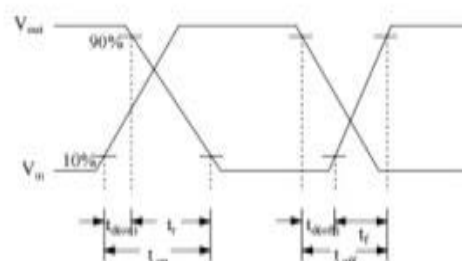
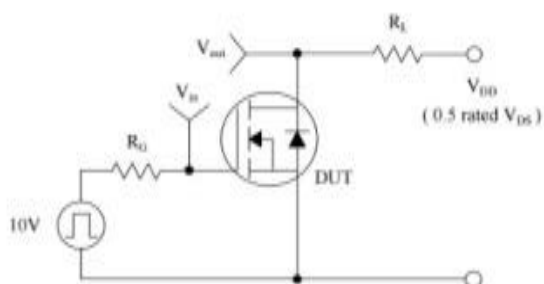


Figure 11. Transient Thermal Response Curve

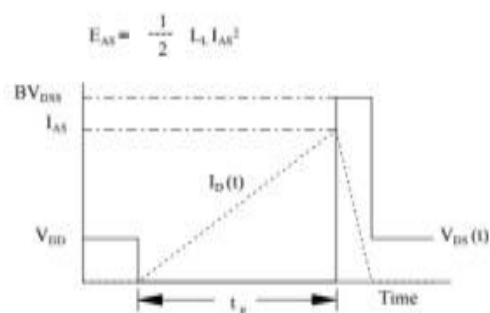
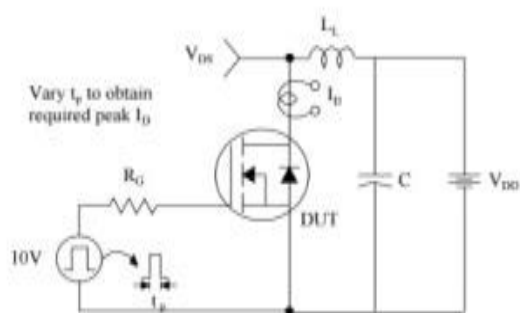
Gate Charge Test Circuit & Waveform



Resistive Switching Test Circuit & Waveforms

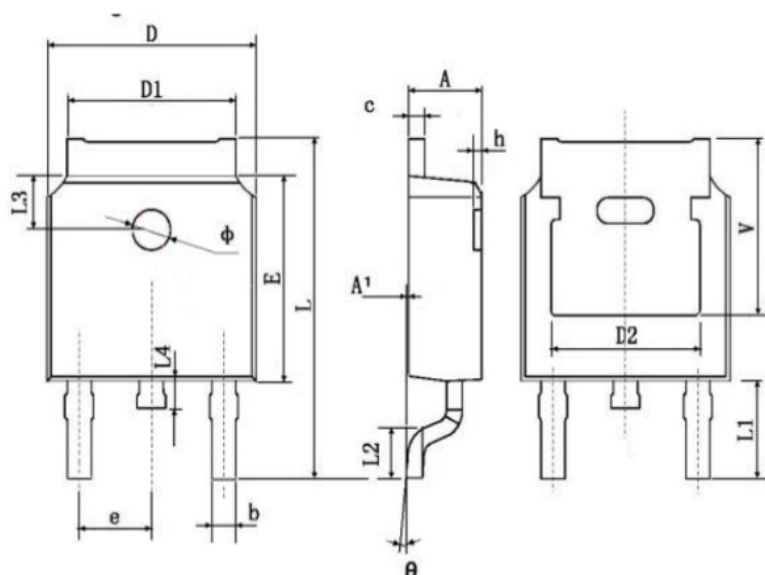


Unclamped Inductive Switching Test Circuit & Waveforms



Package Information

TO-252 DPAK



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.250	2.350	0.089	0.093
A1	0.050	0.150	0.002	0.006
b	0.660	0.860	0.026	0.034
c	0.458	0.558	0.018	0.022
D	6.550	6.650	0.259	0.263
D1	5.234	5.434	0.207	0.215
D2	4.826 TYP.		0.191 TYP.	
E	6.050	6.150	0.239	0.243
e	2.236	2.336	0.088	0.092
L	9.820	10.220	0.388	0.404
L1	3.000 TYP.		0.119 TYP.	
L2	1.400	1.600	0.055	0.063
L3	1.800 TYP.		0.071 TYP.	
L4	0.700	0.900	0.028	0.036
Φ	1.150	1.250	0.045	0.049
θ	0°	3°	0°	3°
h	0.000	0.300	0.000	0.012
V	5.399 TYP		0.213 TYP	