

General Description

This Trench MOSFET has better characteristics, such as fast switching time, low on resistance, low gate charge and excellent avalanche characteristics. It is mainly suitable for DC/DC Converter, Synchronous Rectification and a load switch in battery powered applications

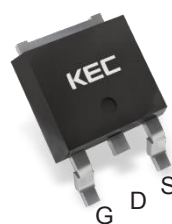
FEATURES

- Split Gate Trench Technology
- Ultra low on-resistance
- Ultra low gate charge (typ. $Q_g=54nC$)
- Periodic avalanche rated
- Pb-free lead plating; RoHS compliant
- Qualified according to JEDEC
- Ideal for high-frequency switching and synchronous rectification

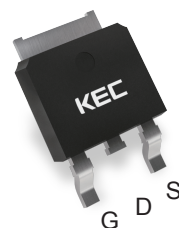
MAIN PARAMETER

V_{DSS}	100	V
$R_{DS(ON)}$ (Max)@ $V_{GS}=10V$	8.6	$m\Omega$
I_D	63	A

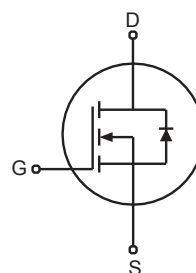
DPAK(1)



DPAK(3)



PIN CONNECTION

MAXIMUM RATING ($T_c=25^\circ C$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Drain-Source Voltage		V_{DSS}	100	V
Gate-Source Voltage		V_{GSS}	± 20	V
Drain Current	@ $T_c=25^\circ C$	I_D	63	A
	@ $T_c=100^\circ C$		39	
	Pulsed (Note 1)	I_{DP}	252*	
Single Pulsed Avalanche Energy (Note 2)		E_{AS}	125	mJ
Repetitive Avalanche Energy (Note 1)		E_{AR}	3.7	mJ
Peak Diode Recovery dv/dt (Note 3)		dv/dt	4.5	V/ns
Drain Power Dissipation	$T_c=25^\circ C$	P_D	62.5	W
	Derate above $25^\circ C$		0.5	W/ $^\circ C$
Maximum Junction Temperature		T_j	150	$^\circ C$
Storage Temperature Range		T_{stg}	-55 ~ 150	$^\circ C$
Thermal Characteristics				
Thermal Resistance, Junction-to-Case		R_{thJC}	2.0	$^\circ C/W$
Thermal Resistance, Junction-to-Ambient		R_{thJA}	110	$^\circ C/W$

* : Drain current limited by maximum junction temperature.

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ELECTRICAL CHARACTERISTICS (T_J=25℃)

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Static						
Drain-Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100	-	-	V
Breakdown Voltage Temperature Coefficient	ΔBV _{DSS} /ΔT _J	I _D =250μA, Referenced to 25℃	-	0.05	-	V/℃
Drain Cut-off Current	I _{DSS}	V _{DS} =100V, V _{GS} =0V,	-	-	10	μA
Gate Threshold Voltage	V _{th}	V _{DS} =V _{GS} , I _D =250μA	2.0	-	4.0	V
Gate Leakage Current	I _{GSS}	V _{GS} =± 20V, V _{DS} =0V	-	-	± 100	nA
Drain-Source ON Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =31.5A	-	6	8.6	mΩ
		V _{GS} =6V, I _D =16A	-	-	12	
Dynamic						
Total Gate Charge	Q _g	V _{DS} =80V, I _D =55A V _{GS} =10V (Note4,5)	-	54	-	nC
Gate-Source Charge	Q _{gs}		-	18	-	
Gate-Drain Charge	Q _{gd}		-	13	-	
Turn-on Delay time	t _{d(on)}	V _{DD} =50V I _D =55A R _G =25Ω (Note4,5)	-	51	-	ns
Turn-on Rise time	t _r		-	39	-	
Turn-off Delay time	t _{d(off)}		-	110	-	
Turn-off Fall time	t _f		-	46	-	
Input Capacitance	C _{iss}	V _{DS} =25V, V _{GS} =0V, f=1.0MHz	-	3440	-	pF
Output Capacitance	C _{oss}		-	1490	-	
Reverse Transfer Capacitance	C _{rss}		-	106	-	
Source-Drain Diode Ratings						
Continuous Source Current	I _S	V _{GS} <V _{th}	-	-	44	A
Pulsed Source Current	I _{SP}		-	-	176	
Diode Forward Voltage	V _{SD}	I _S =44A, V _{GS} =0V	-	-	1.4	V
Reverse Recovery Time	t _{rr}	I _S =55A, V _{GS} =0V,	-	82	-	ns
Reverse Recovery Charge	Q _{rr}	dI _S /dt=100A/μs	-	0.18	-	μC

Note 1) Repetivity rating : Pulse width limited by junction temperature.

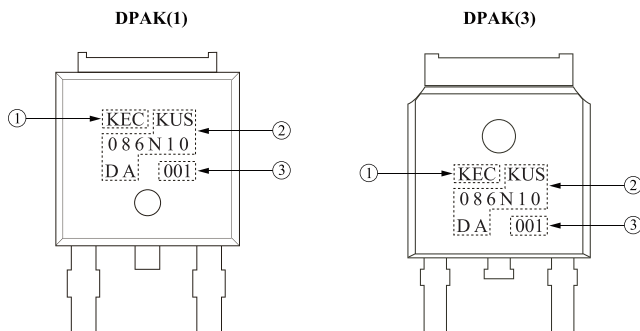
Note 2) L = 22.7μH, I_S=63A, V_{DD}=80V, R_G=25Ω, Starting T_J=25℃.

Note 3) I_S≤63A, V_{DD}≤BV_{DSS}, Starting T_J=25℃.

Note 4) Pulse Test : Pulse width ≤ 300μs, Duty Cycle ≤ 2%.

Note 5) Essentially independent of operating temperature.

MARKING



- ① KEC LOGO
- ② PRODUCT NAME
- ③ LOT NO.

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Fig1. $I_D - V_{DS} - I$

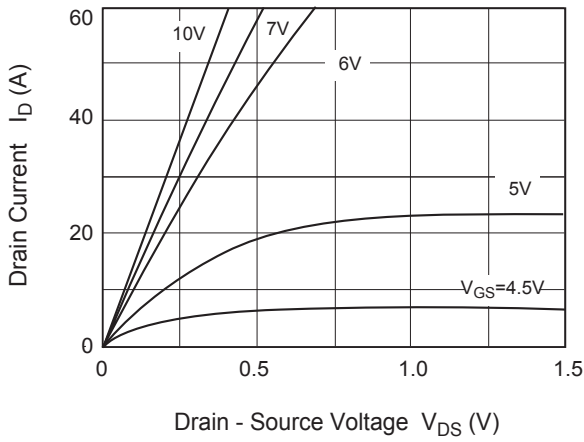


Fig2. $I_D - V_{DS} - II$

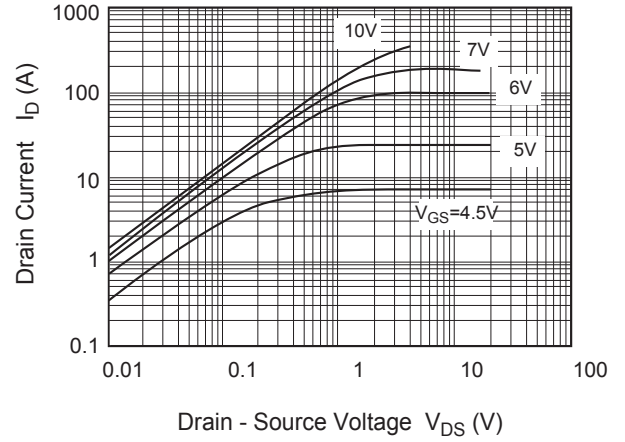


Fig3. $I_D - V_{GS}$

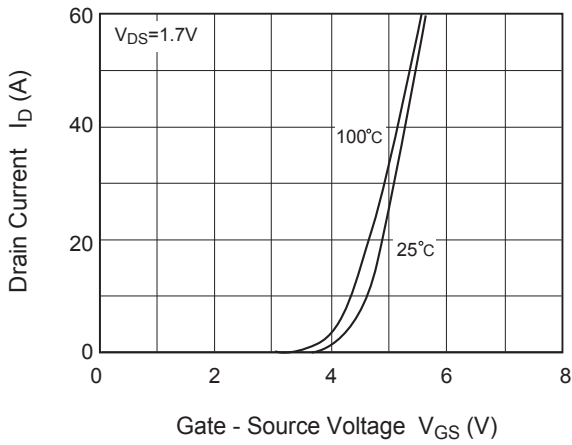


Fig4. $R_{DS(ON)} - I_D$

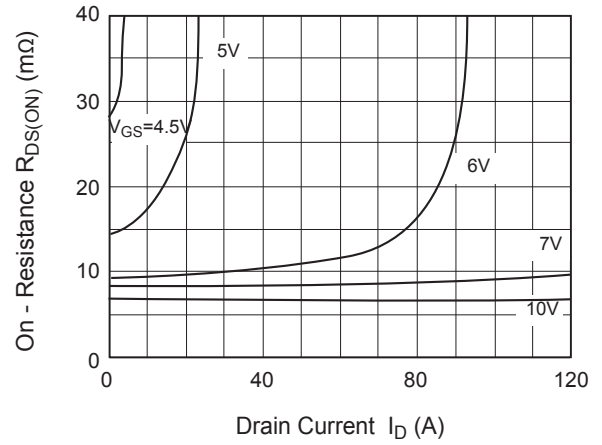


Fig5. $R_{DS(ON)} - V_{GS}$

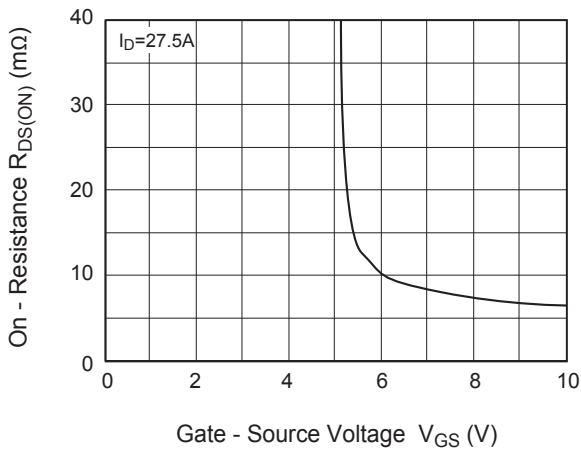
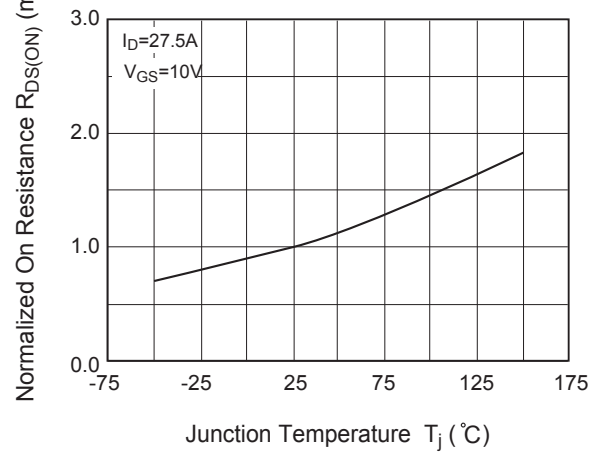


Fig6. $R_{DS(ON)} - T_j$



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Fig7. $BV_{DSS} - T_j$

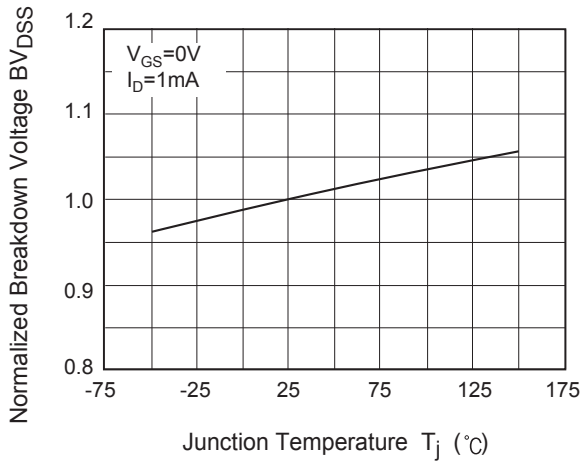


Fig 8. $V_{th} - T_j$

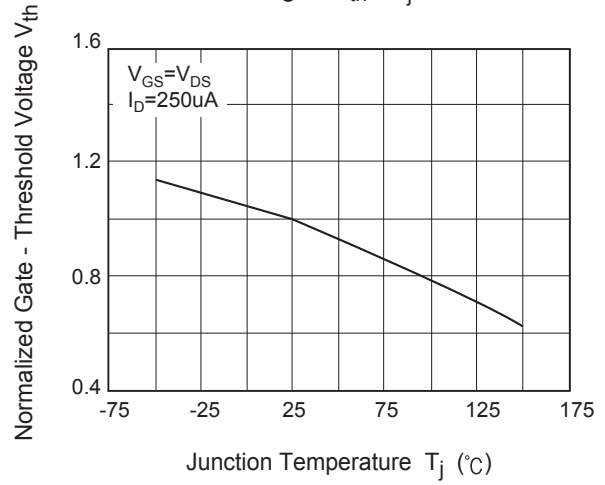


Fig9. $I_S - V_{SD} - I$

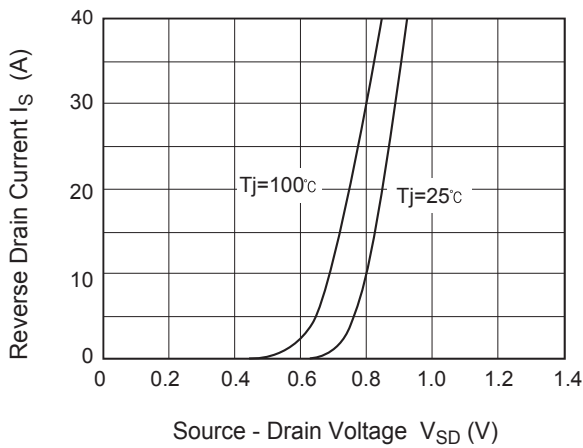


Fig10. $I_S - V_{SD} - II$

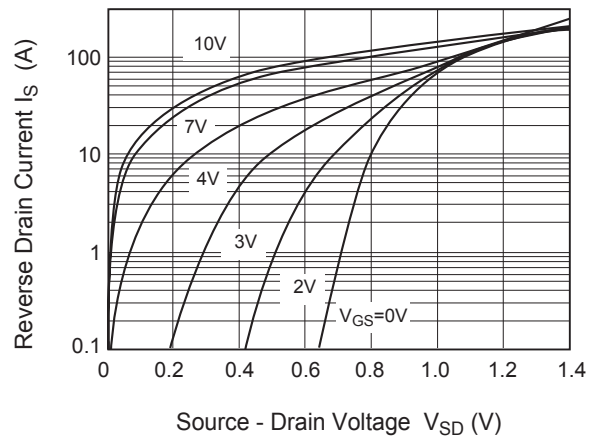


Fig 11. $C - V_{DS}$

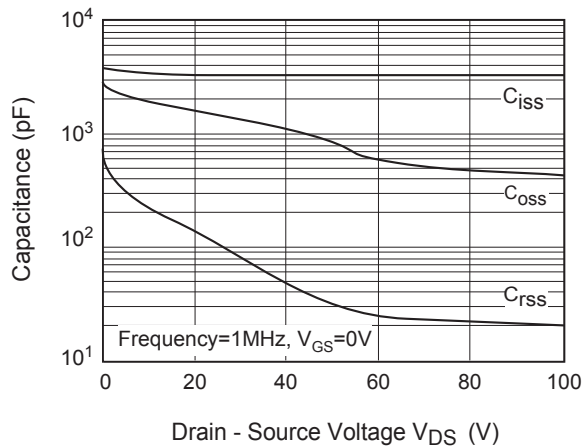


Fig12. $Q_g - V_{DS}$

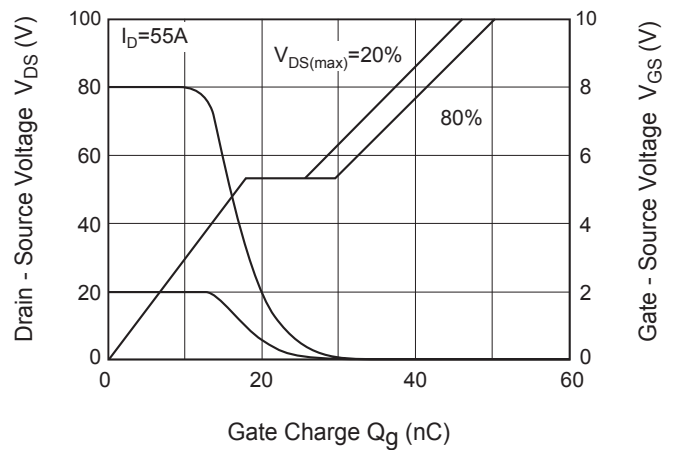


Fig13. $I_D - T_j$

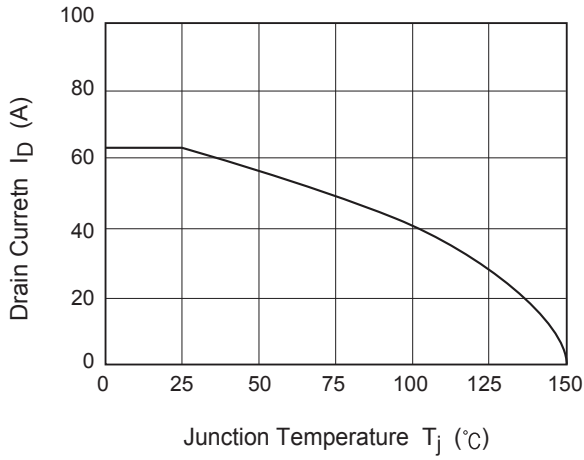


Fig 14. $P_{tot} - T_C$

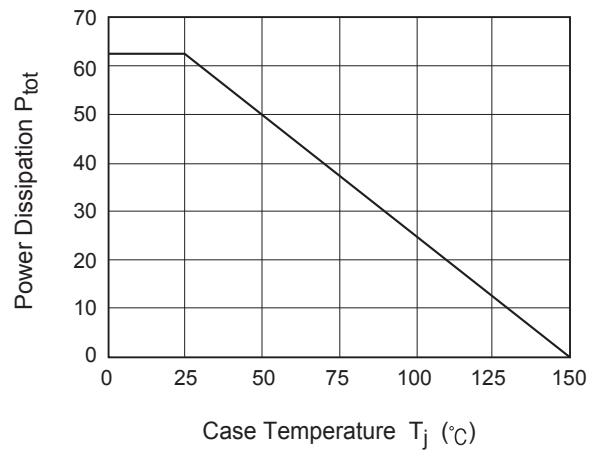


Fig15. S/W Time - I_D

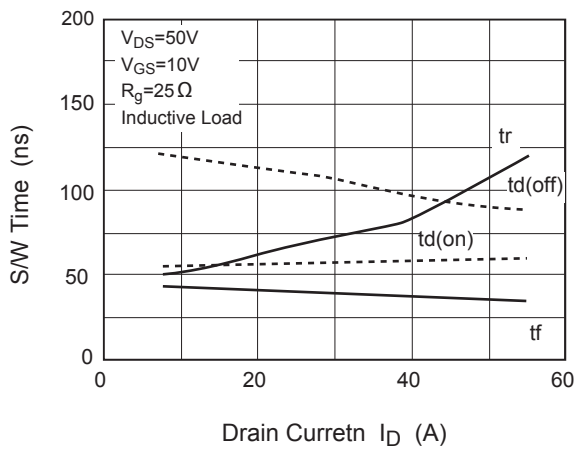


Fig16. S/W Loss - I_D

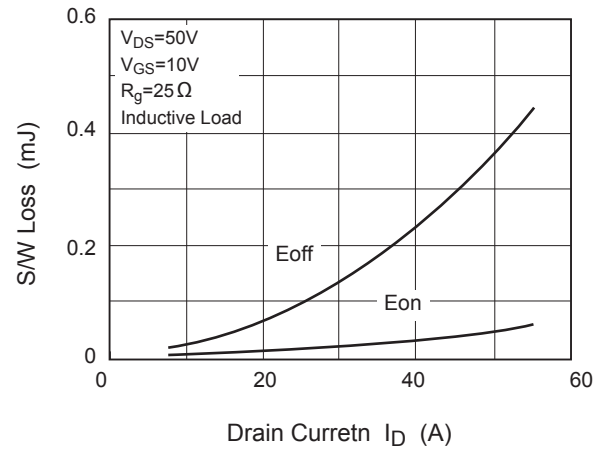


Fig17. S/W Time - R_g

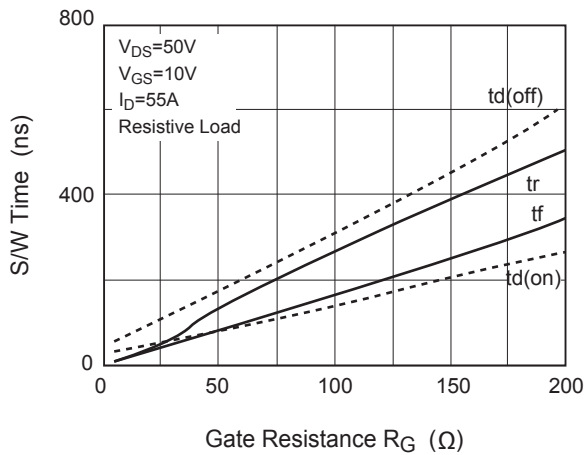


Fig18. S/W Loss - R_g

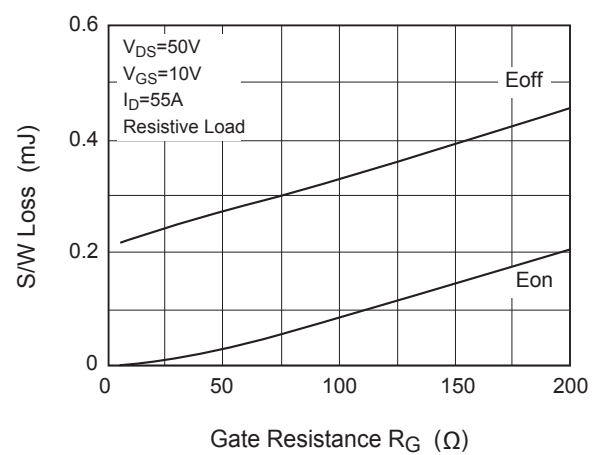


Fig 19. Safe Operation Area

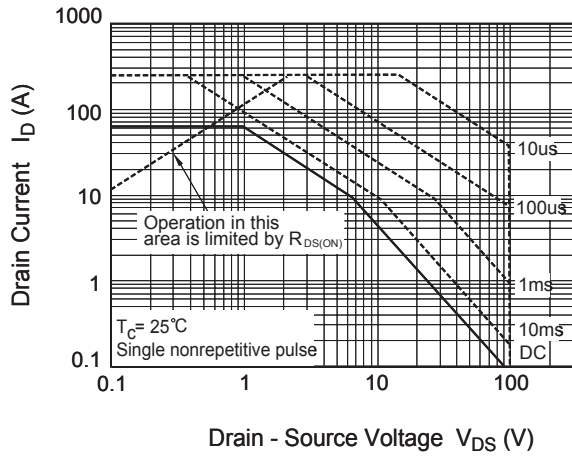


Fig20. Transient Thermal Response Curve (Junction - Case)

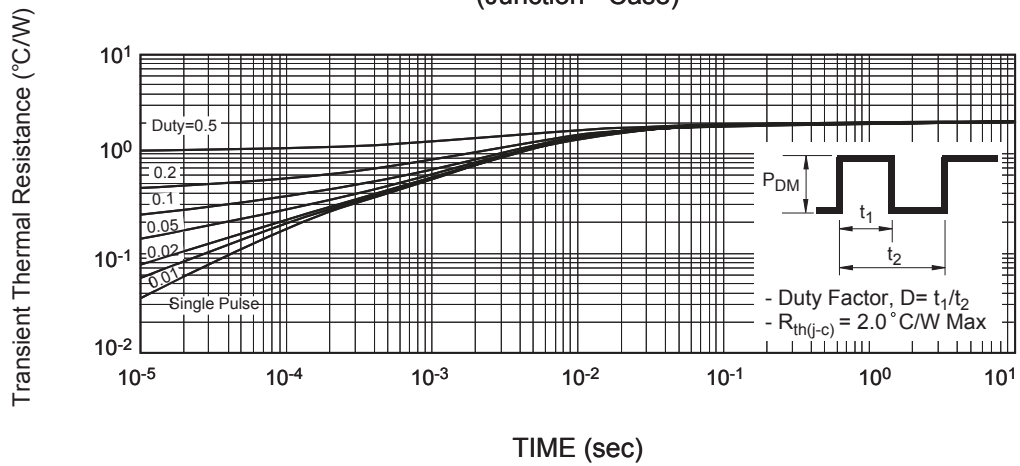


Fig21. Transient Thermal Response Curve (Junction - Ambient)

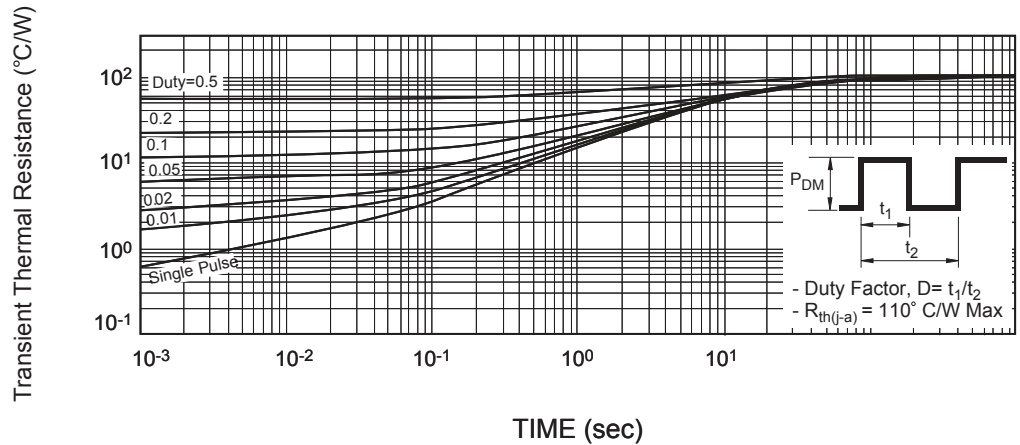


Fig22. Gate Charge

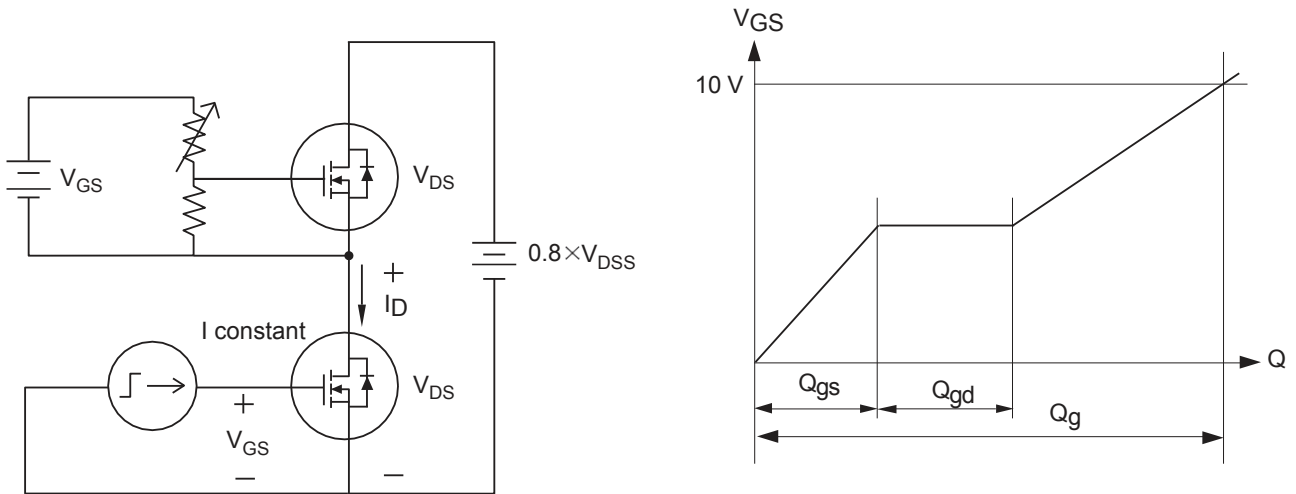


Fig23. Single Pulsed Avalanche Energy

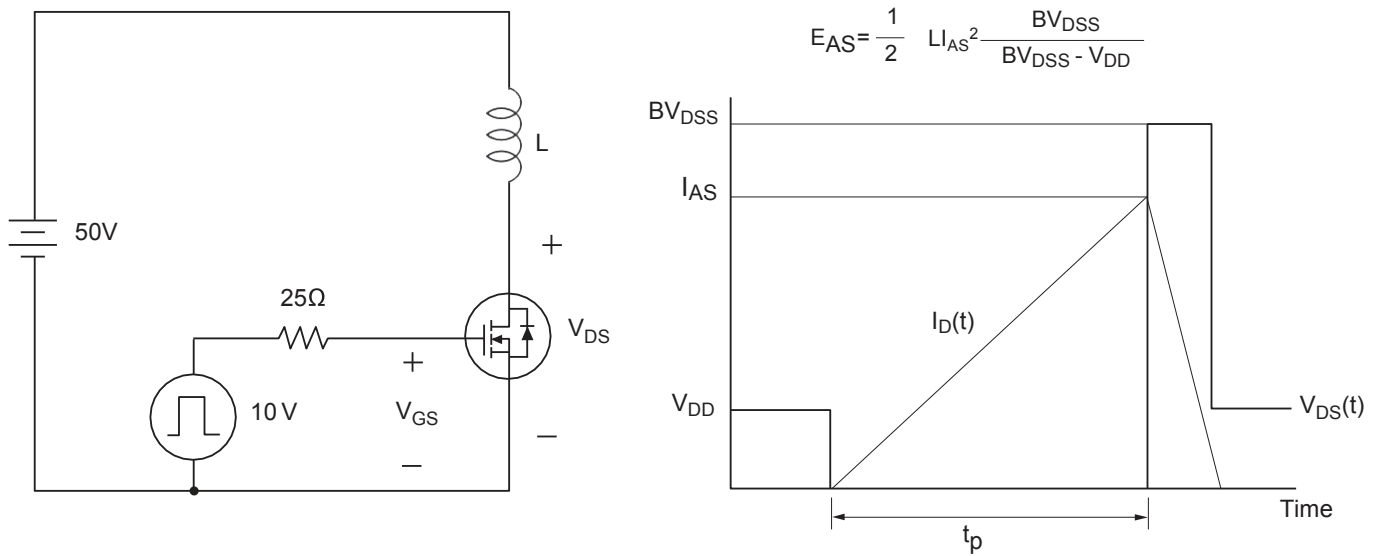


Fig24. Resistive Load Switching

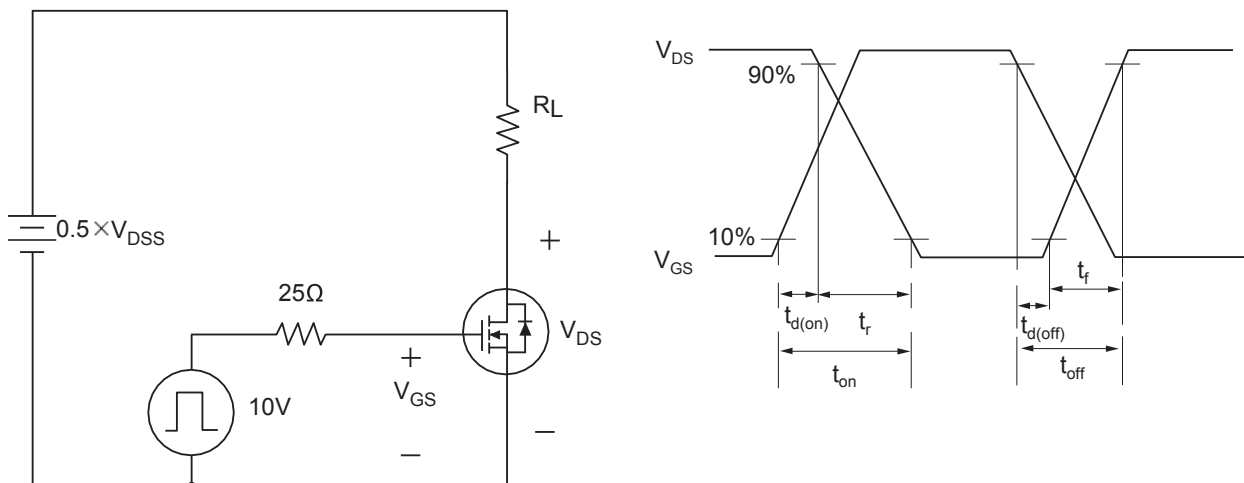
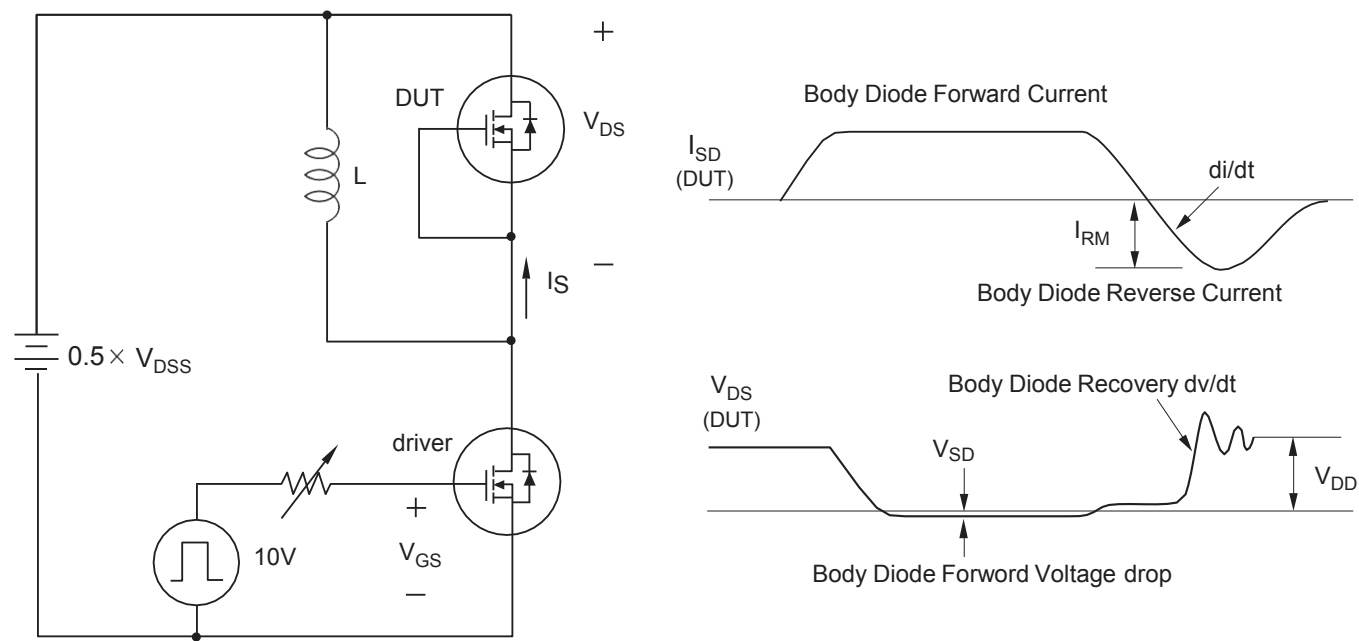
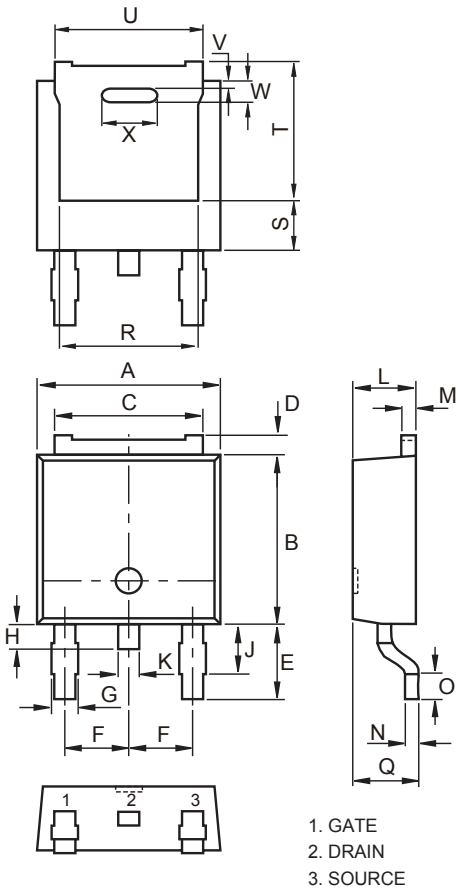


Fig25. Source - Drain Diode Reverse Recovery and dv/dt



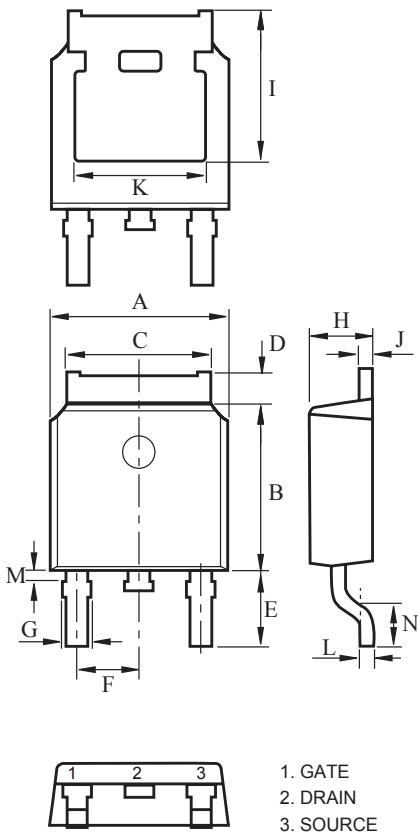
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PACKAGE OUTLINE (DPAK(1))



DIM	MILLIMETERS
A	6.60 ± 0.20
B	6.10 ± 0.20
C	5.34 ± 0.30
D	0.70 ± 0.20
E	2.70 ± 0.15
F	2.30 ± 0.10
G	0.96 MAX
H	0.90 MAX
J	1.80 ± 0.20
K	0.76 ± 0.20
L	2.30 ± 0.10
M	0.50 ± 0.10
N	0.50 ± 0.10
O	0.70 MIN
Q	2.4 ± 0.2
R	5.0 ± 0.2
S	1.75 ± 0.3
T	5.0 ± 0.3
U	5.34 ± 0.3
V	0.27 ± 0.05
W	0.77 ± 0.1
X	2.0 ± 0.1

PACKAGE OUTLINE (DPAK(3))



DIM	MILLIMETERS
A	6.60 ± 0.1
B	6.1 ± 0.1
C	5.33 ± 0.2
D	1.1 ± 0.2
E	2.90 REF
F	2.286 ± 0.1
G	0.9 Max.
H	2.3 ± 0.1
I	5.25 Min
J	0.5 ± 0.1
K	4.70 Min
L	0.508 BSC
M	0.75 Max
N	1.5 ± 0.2