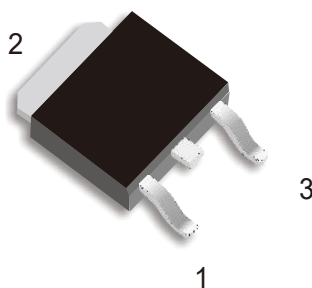


General Description

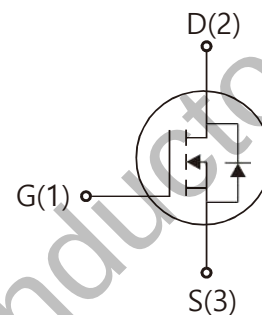
This Power MOSFET is produced using Ctk's advanced Shielding Gate MOSFET technology. This advanced technology has been especially tailored to minimize on-state resistance, provide superior switching performance, and withstand high energy pulse in the avalanche and commutation mode. These devices are well suited for low voltage applications such as DC/DC converters and high efficiency switching for power management in portable and battery operated products.

Features

- 100A¹⁾, 30V, $R_{DS(on)typ} = 3.0m\Omega @ V_{GS} = 10V$
 $R_{DS(on)typ} = 5.5m\Omega @ V_{GS} = 4.5V$
- Very Low On-resistance $R_{DS(ON)}$
- Low C_{rss}
- Fast switching
- 100% avalanche tested
- Improved dv/dt capability



TO-252



- 1.Gate (G)
- 2.Drain (D)
- 3.Source (S)

Absolute Maximum Ratings

$T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter		Units
V_{DSS}	Drain-Source Voltage	30	V
I_D	Drain Current ¹⁾ - Continuous ($T_C = 25^\circ\text{C}$) - Continuous ($T_C = 100^\circ\text{C}$)	100	A
		75	A
I_{DM}	Drain Current ¹⁾ - Pulsed	400	A
V_{GSS}	Gate-Source Voltage	± 20	V
E_{AS}	Single Pulsed Avalanche Energy ²⁾	133	mJ
P_D	Power Dissipation ($T_C = 25^\circ\text{C}$)	74	W
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to +150	$^\circ\text{C}$
T_L	Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	260	$^\circ\text{C}$

Thermal Characteristics

R_{thJC}	Thermal Resistance, Junction to Case	1.68	$^\circ\text{C/W}$
R_{thJA}	Thermal Resistance, Junction to ambient	62.5	$^\circ\text{C/W}$

Electrical Characteristics $T_C = 25^\circ\text{C}$ unless otherwise noted

Symbol	Parameter	Test Conditions	Min	Typ	Max	Units
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Off Characteristics

BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	30	--	--	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
I_{GSSF}	Gate-Body Leakage Current, Forward	$V_{GS} = 20\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
I_{GSSR}	Gate-Body Leakage Current, Reverse	$V_{GS} = -20\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

On Characteristics

$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1.0	1.5	2.2	V
$R_{DS(on)}$	Static Drain-Source On-Resistance	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	--	3.0	4.0	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 15\text{ A}$	--	5.5	7.7	$\text{m}\Omega$

Dynamic Characteristics

C_{iss}	Input Capacitance	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$	--	2684	--	pF
C_{oss}	Output Capacitance		--	263	--	pF
C_{rss}	Reverse Transfer Capacitance		--	247	--	pF

Switching Characteristics

$t_{d(on)}$	Turn-On Delay Time	$V_{DS} = 24\text{ V}, V_{GS} = 10\text{ V}$ $R_G = 3\text{ }\Omega, I_D = 65\text{ A}$	--	12	--	ns
t_r	Turn-On Rise Time		--	230	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	34	--	ns
t_f	Turn-Off Fall Time		--	140	--	ns
Q_g	Total Gate Charge	$V_{DS} = 24\text{ V}, I_D = 100\text{ A},$ $V_{GS} = 10\text{ V}$	--	52	--	nC
Q_{gs}	Gate-Source Charge		--	10	--	nC
Q_{gd}	Gate-Drain Charge		--	18	--	nC

Drain-Source Diode Characteristics

I_S	Maximum Continuous Drain-Source Diode Forward Current	--	--	100	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current	--	--	400	A
V_{SD}	Drain to Source Diode Forward Voltage, $V_{GS} = 0\text{ V}, I_{SD} = 20\text{ A}, T_J = 25^\circ\text{C}$	--	0.8	--	V
t_{rr}	Reverse Recovery Time & $T_J = 25^\circ\text{C}, I_F = 65\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	--	12	--	nS
Q_{rr}	Reverse Recovery Charge & $T_J = 25^\circ\text{C}, I_F = 65\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	--	9	--	nC
I_{rm}	Peak Reverse Recovery Current & $T_J = 25^\circ\text{C}, I_F = 65\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$	--	2	--	A

Notes:

1. Repetitive Rating : Drain current limited by package.
2. EAS condition: $T_J = 25^\circ\text{C}, V_{DD} = 20\text{ V}, V_{GS} = 10\text{ V}, L = 0.5\text{ mH}, I_{AS} = 23.1\text{ A}$
3. These curves are based on the junction-to-case thermal impedance R_{thjc} , assuming maximum junction temperature is 150°C . These curves provide a single pulse rating.

Typical Characteristics

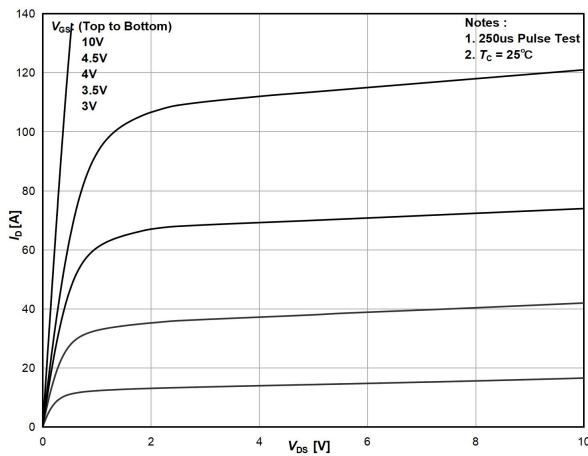


Figure 1. On-Region Characteristics

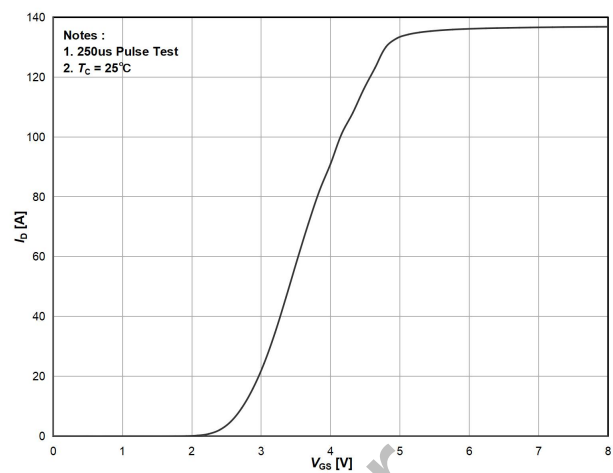


Figure 2. Transfer Characteristics

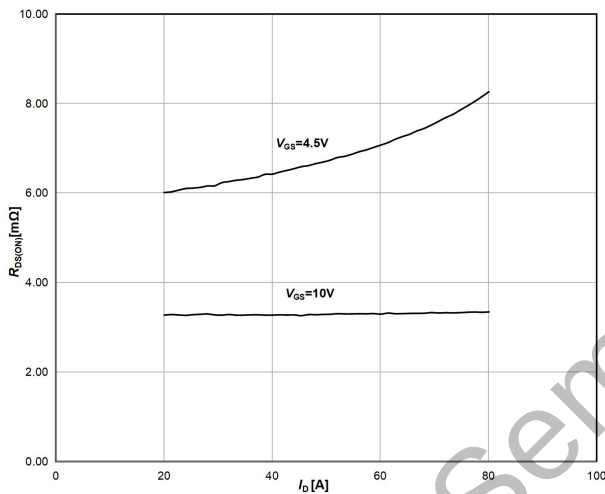


Figure 3. On-Resistance Variation vs Drain Current and Gate Voltage

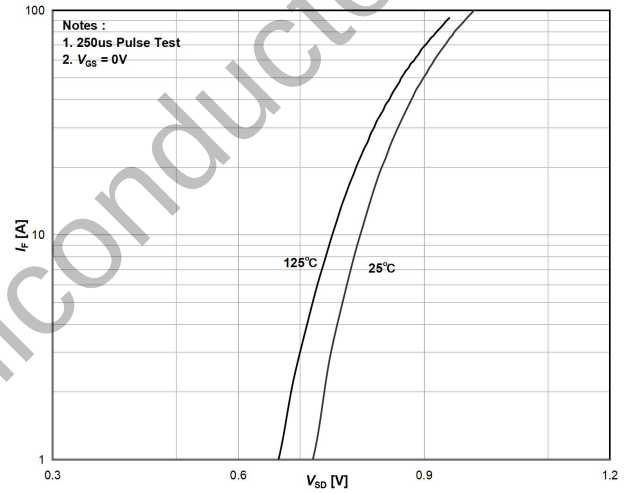


Figure 4. Body Diode Forward Voltage Variation with Current

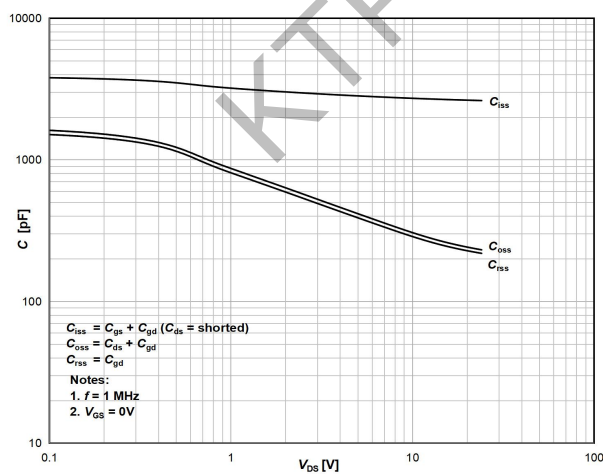


Figure 5. Capacitance Characteristics

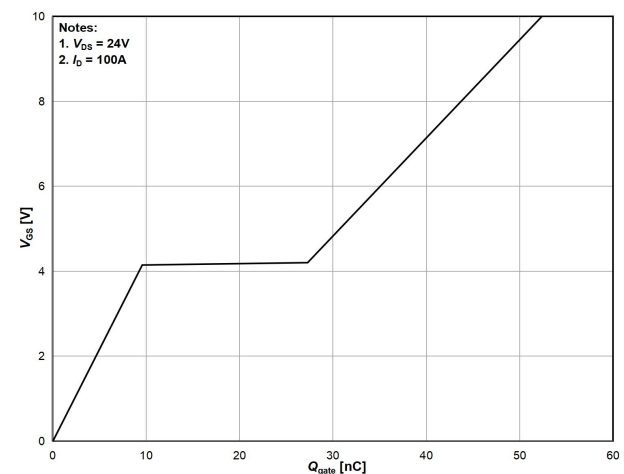


Figure 6. Gate Charge Characteristics

Typical Characteristics (Continued)

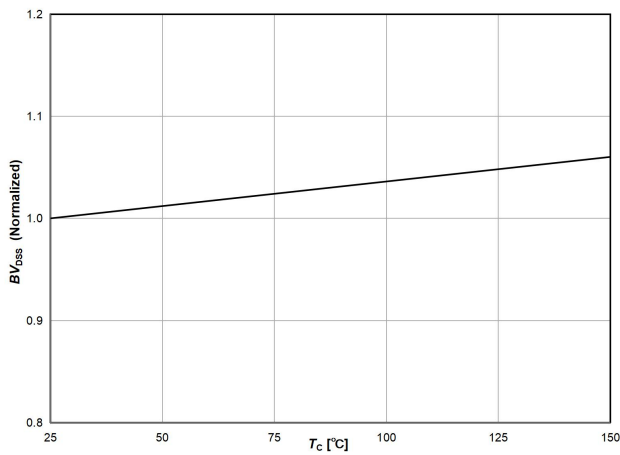


Figure 7. Breakdown Voltage Variation vs Temperature

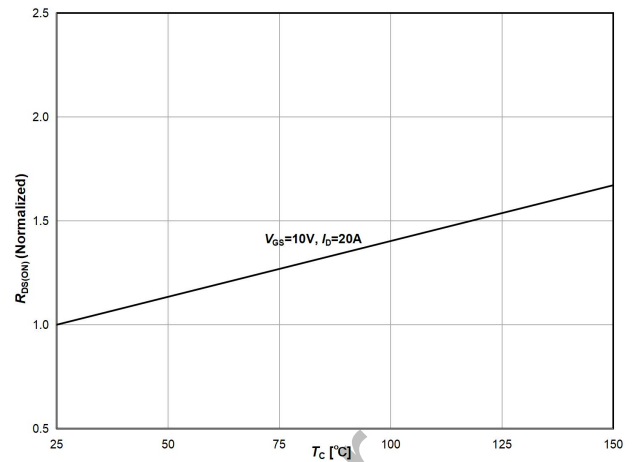


Figure 8. On-Resistance Variation vs Temperature

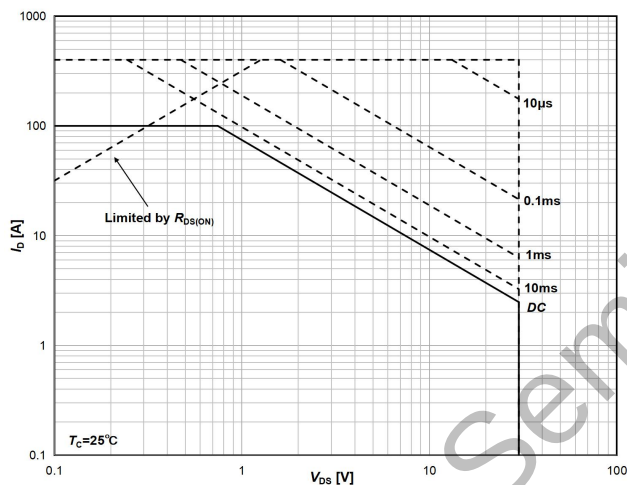


Figure 9. Maximum Safe Operating Area³⁾

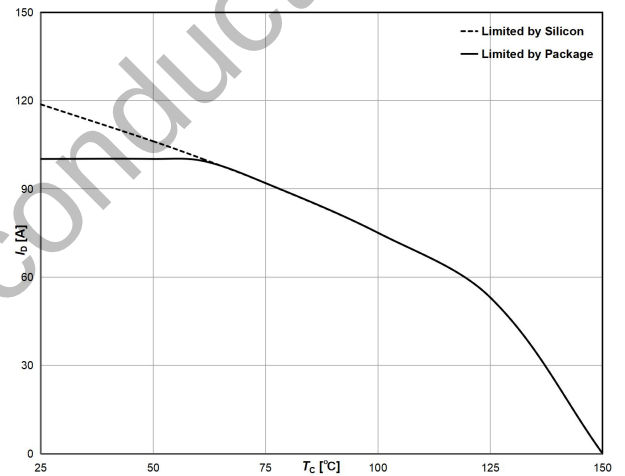


Figure 10. Maximum Drain Current vs Case Temperature

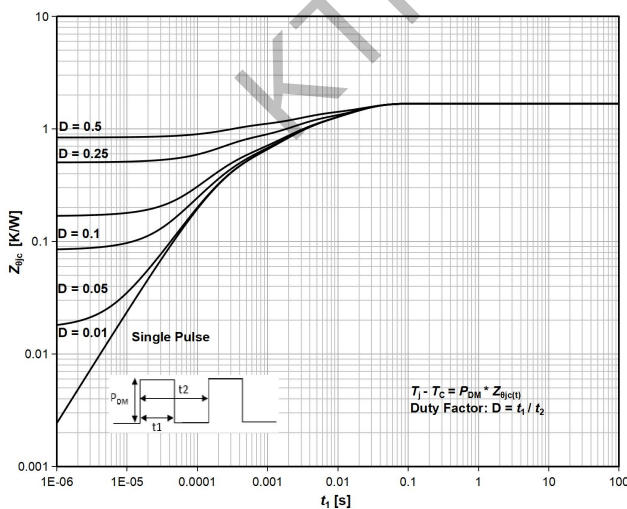
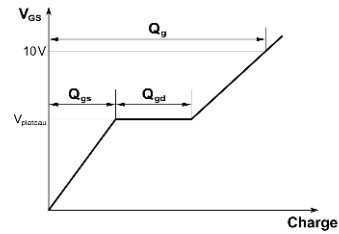
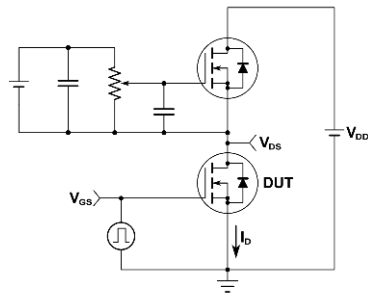
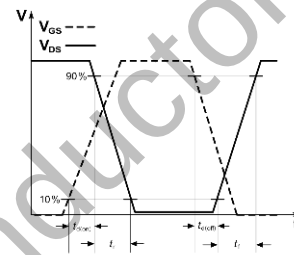
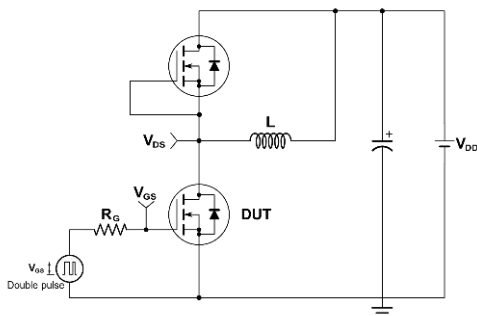


Figure 11. Transient Thermal Response Curve

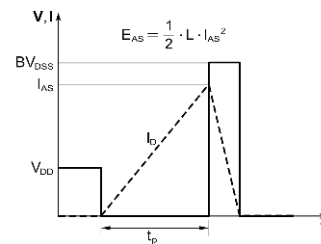
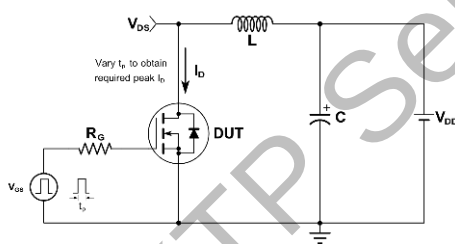
Test Circuits and waveforms



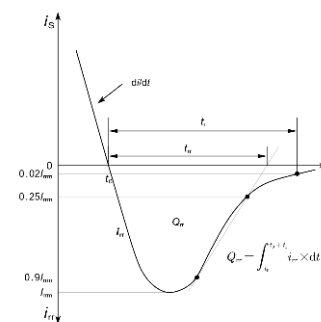
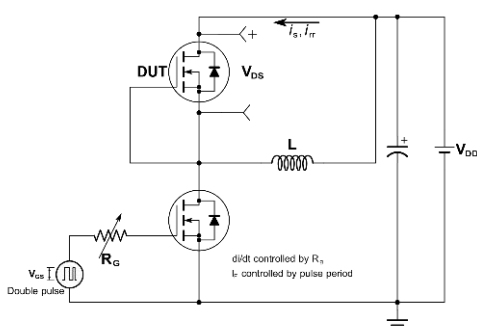
Gate charge test circuit & waveform



Switching times for inductive load test circuit & waveform

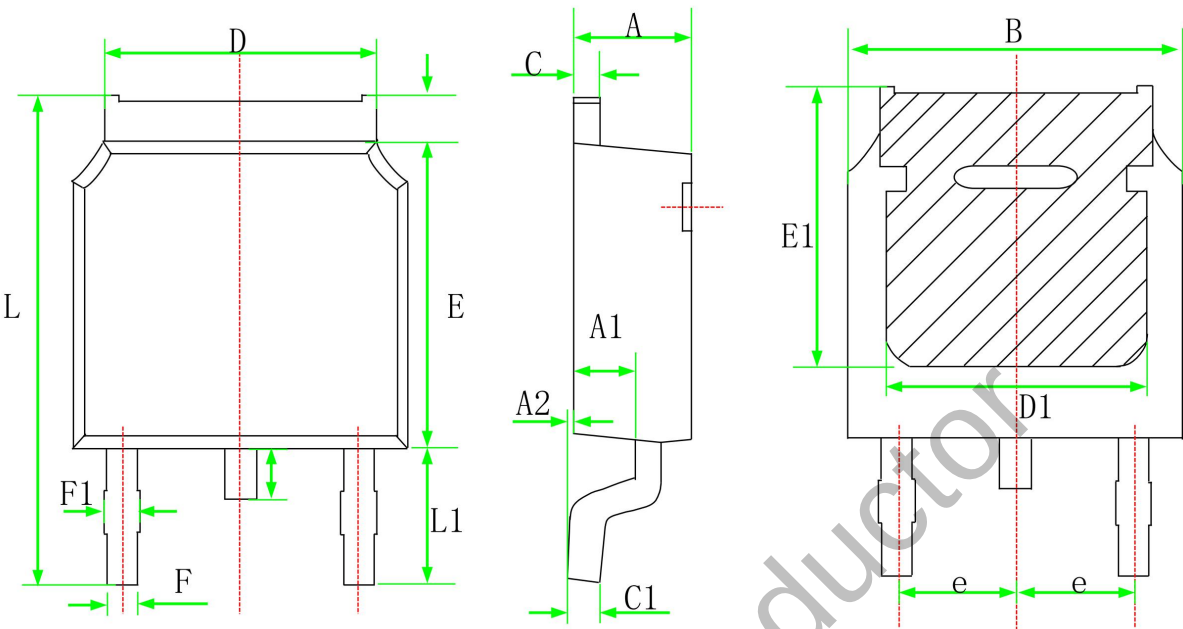


Unclamped inductive load test circuit & waveform



Diode characteristics test circuit & waveform

TO-252 OUTLINE



SYMBOL	Mechanical Dimensions/mm			SYMBOL	Mechanical Dimensions/mm		
	MIN	NOM	MAX		MIN	NOM	MAX
A	2.2	2.3	2.4	D	5.1	5.25	5.46
A1	0.93	1.07	1.17	D1	4.4	4.83	5.35
A2	0		0.15	E	5.9	6.1	6.3
B	6.4	6.6	6.8	E1	4.95	5.15	5.35
C	0.43	0.5	0.61	L	9.8	10.1	10.4
C1	0.45	0.5	0.6	L1	2.6	2.8	3
F	0.61	0.76	0.91	e	2.186	2.286	2.386
F1	0.65	0.85	1.05				

NAME	TO-220FLX OUTLINE	UNIT	mm	DESIGNED	sn	
DWGNO		PAGE	1 OF 1	CHECKED		
VERSION	Ver1.1	ISSUE DATE		APPROVED		