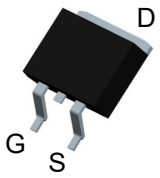
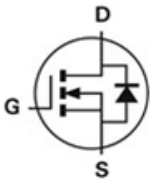
N-Channel Enhancement Mode MOSFET

Features

- Fast switching speed
- Reliable and Rugged
- ROHS Compliant
- 100% UIS and Rg Tested

Pin Description

TO-263	Symbol
	

Applications

- High Frequency Point-of-Load Synchronous Buck Converter
- Networking DC-DC Power System
- Load Switch

V_{DSS}	40	V
$R_{DS(ON)-Typ}$	1.3	mΩ
I_D	180	A

Absolute Maximum Ratings(T_C=25℃, Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit
V_{DSS}	Drain-Source Voltage	40	V
V_{GSS}	Gate-Source Voltage	±20	V
T_J	Maximum Junction Temperature	-55 to 150	℃
T_{STG}	Storage Temperature Range	-55 to 150	℃
I_{DM} ①	Pulse Drain Current Tested	720	A
I_D	Continuous Drain Current	180	A
P_D	Maximum Power Dissipation	250	W
E_{AS}	Avalanche Energy, Single pulse	1512	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$	Thermal Resistance-Junction to Ambient	42	℃/W
$R_{\theta JC}$	Thermal Resistance-Junction to Case	0.5	℃/W

Note ①: Max. current is limited by bonding wire.

Note ②: UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③: Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=32V, V_{GS}=0V	---	---	1	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	1.0	---	2.0	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V, I_D=30A	---	1.3	1.6	mΩ
		V_{GS}=4.5V, I_D=20A	---	1.8	2.2	mΩ
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=20V, Freq.=1MHz	---	14308	---	pF
C_{oss}	Output Capacitance		---	1036	---	
C_{rss}	Reverse Transfer Capacitance		---	308	---	
$T_{d(on)}$	Turn-on Delay Time	V_{DD}=20V , V_{GS}=10V , R_G=3.9Ω, I_D=30A	---	25	---	nS
T_r	Turn-on Rise Time		---	110	---	
$T_{d(off)}$	Turn-off Delay Time		---	190	---	
T_f	Turn-off Fall Time		---	126	---	
Q_g	Total Gate Charge	V_{GS}=10V,V_{DS}=20V , I_D=30A	---	238	---	nC
Q_{gs}	Gate-Source Charge		---	53	---	
Q_{gd}	Gate-Drain Charge		---	32	---	
Source-Drain Characteristics						
V_{SD}④	Diode Forward Voltage	I_S=30A, V_{GS}=0V	---	---	1.3	V
t_{rr}	Reverse Recovery Time	I_F=30A, dI_F/dt=100A/μs	---	34	---	nS
Q_{rr}	Reverse Recovery Charge		---	25	---	nC

Note ④: Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

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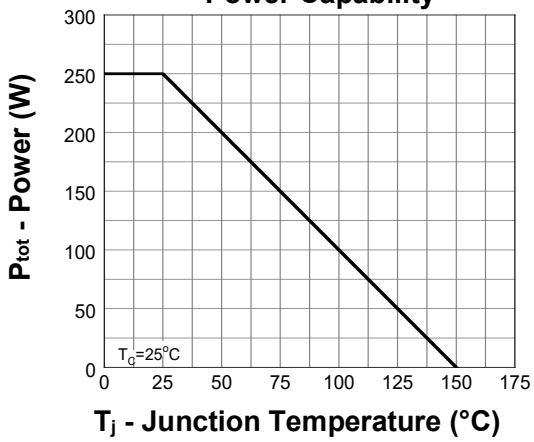
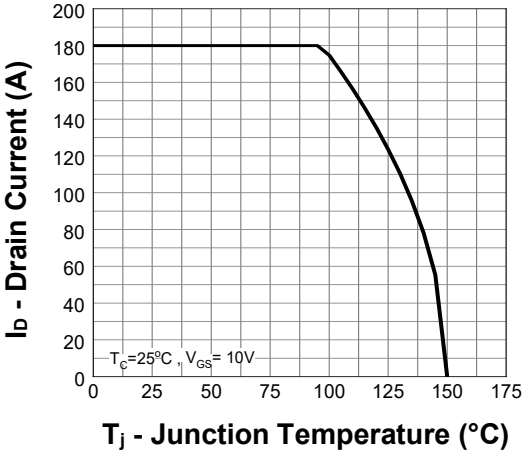
Typical Characteristics

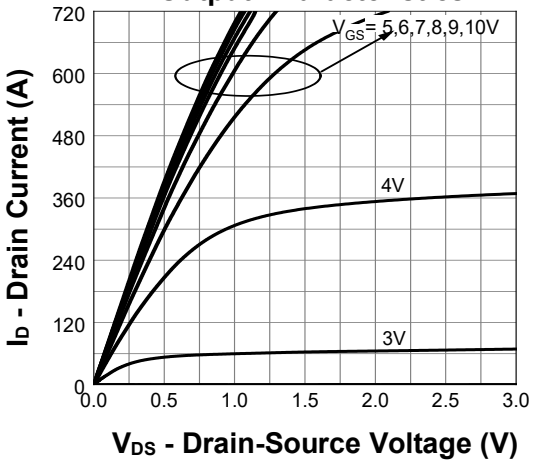
Power Capability



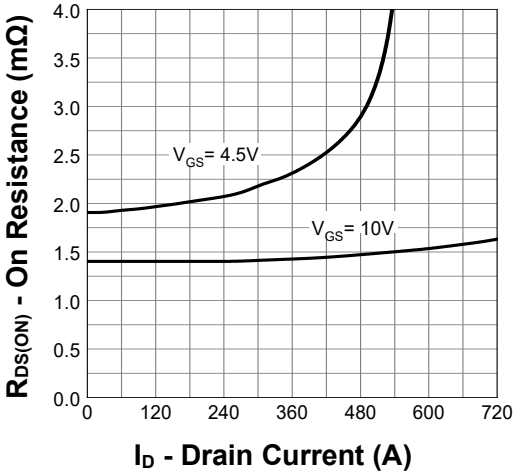
Current Capability



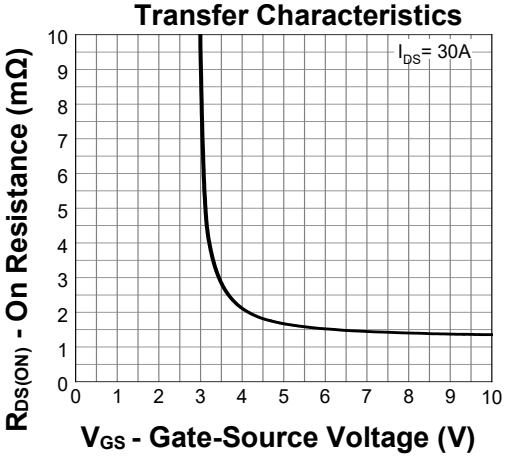
Output Characteristics



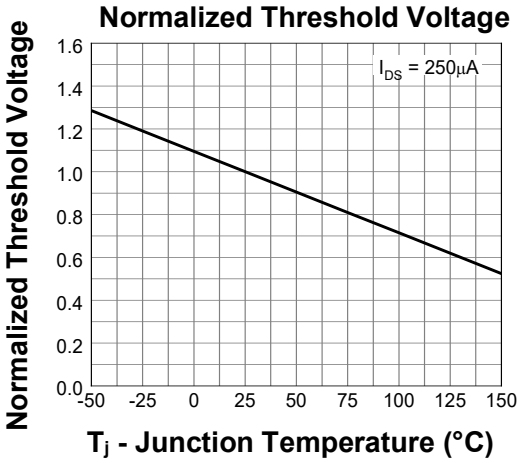
On Resistance



Transfer Characteristics



Normalized Threshold Voltage



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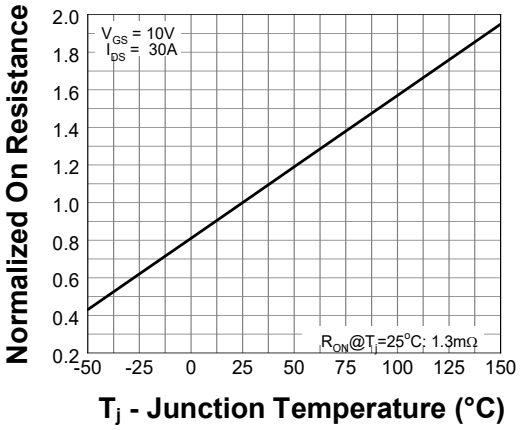
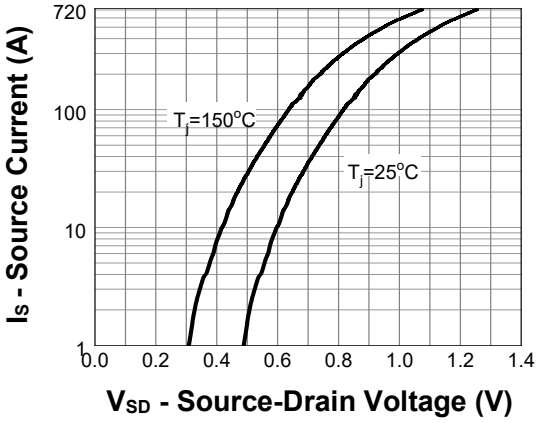
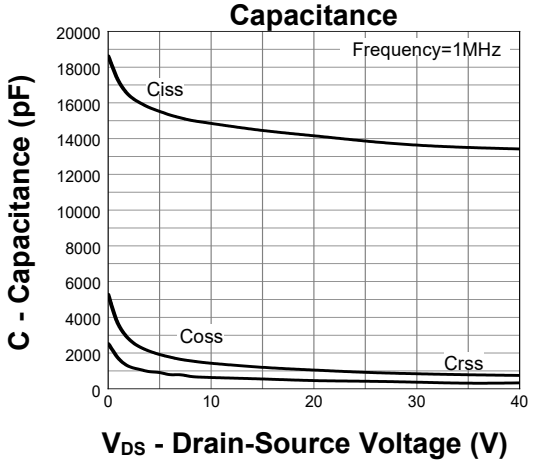
Normalized On Resistance



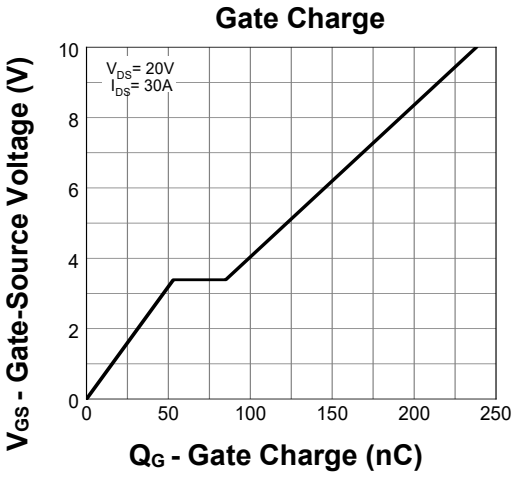
Diode Forward Current



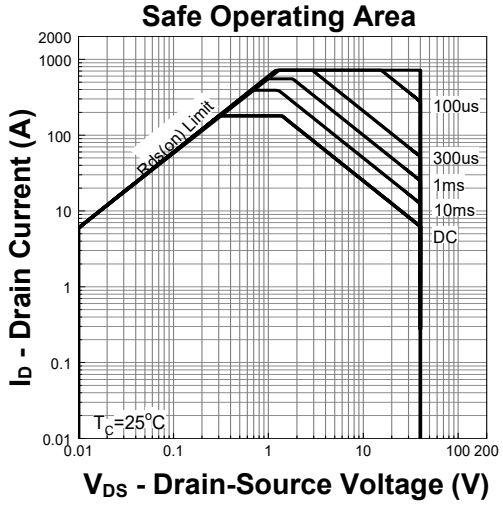
Capacitance



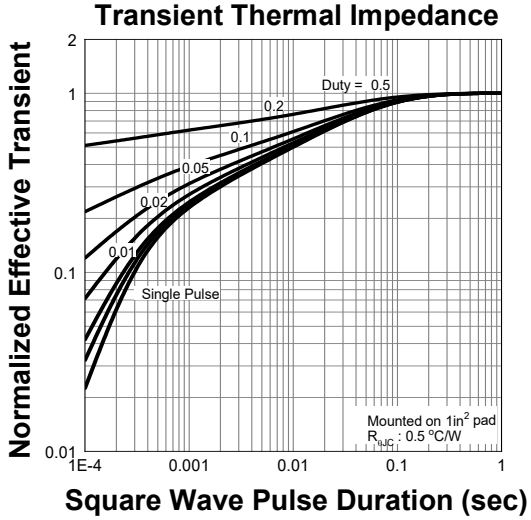
Gate Charge



Safe Operating Area



Transient Thermal Impedance



TO-263 Package Outline Data