

N-Channel Enhancement Mode MOSFET

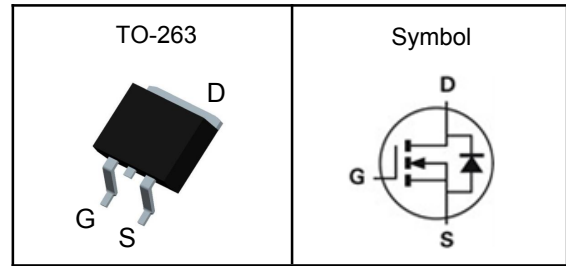
Features

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

Applications

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

Pin Description



V_{DSS}	60	V
$R_{DS(ON)-Typ}$	7	m Ω
I_D	70	A

Absolute Maximum Ratings ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	N-Channel	Unit	
V_{DSS}	Drain-Source Voltage	60	V	
V_{GSS}	Gate-Source Voltage	± 20	V	
T_J	Maximum Junction Temperature	-55 to 150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_C=25^\circ\text{C}$	240	A
I_D	Continuous Drain Current	$T_C=25^\circ\text{C}$	70	A
P_D	Maximum Power Dissipation	$T_C=25^\circ\text{C}$	65	W
$I_{AS}^{②}$	Avalanche Current, Single pulse		40	A
$E_{AS}^{②}$	Avalanche Energy, Single pulse		80	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	62	$^\circ\text{C}/\text{W}$
$R_{\theta JC}$	Thermal Resistance-Junction to Case	1.4	$^\circ\text{C}/\text{W}$

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

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

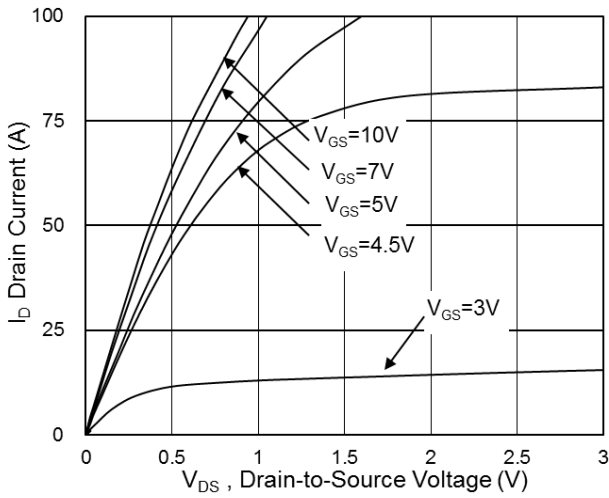
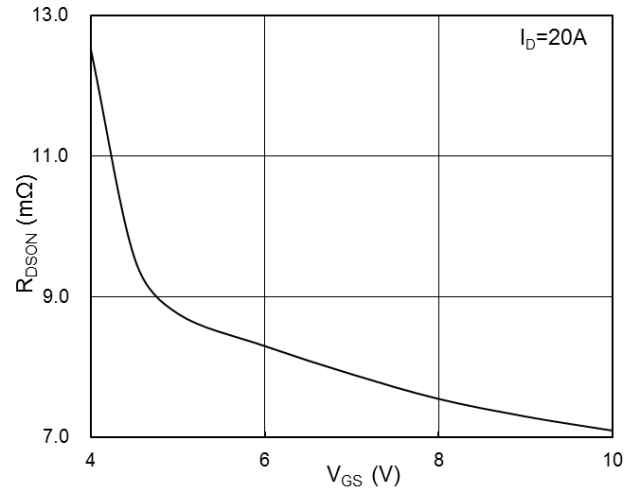
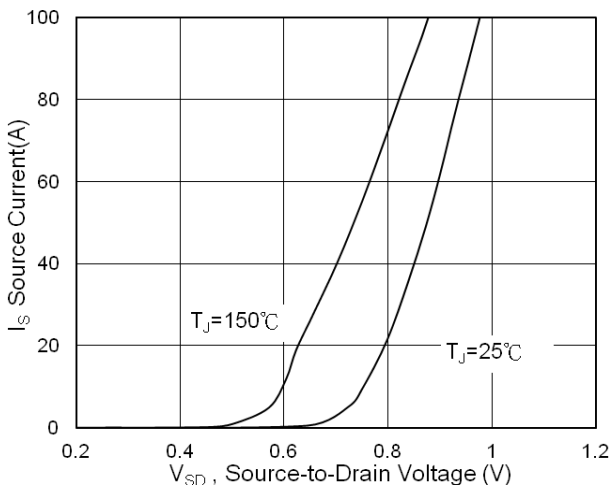
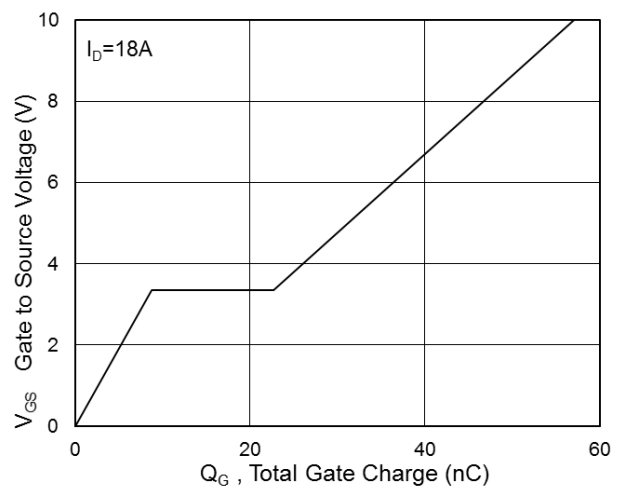
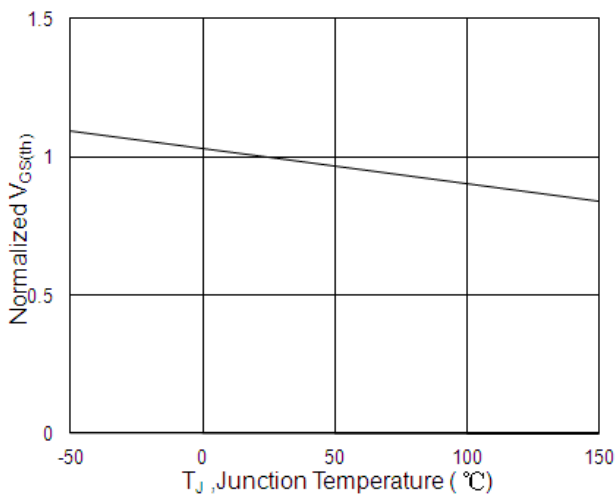
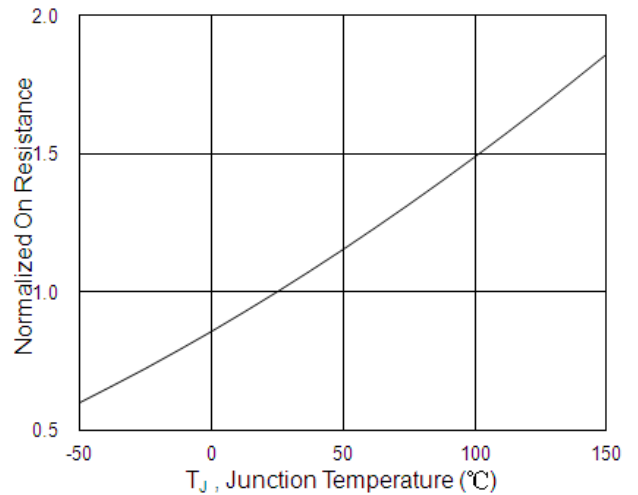
Note ③ : Surface Mounted on 1in^2 FR-4 board with 1oz.

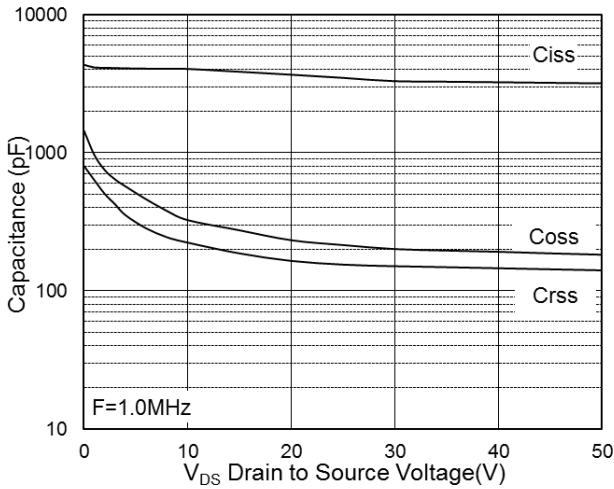
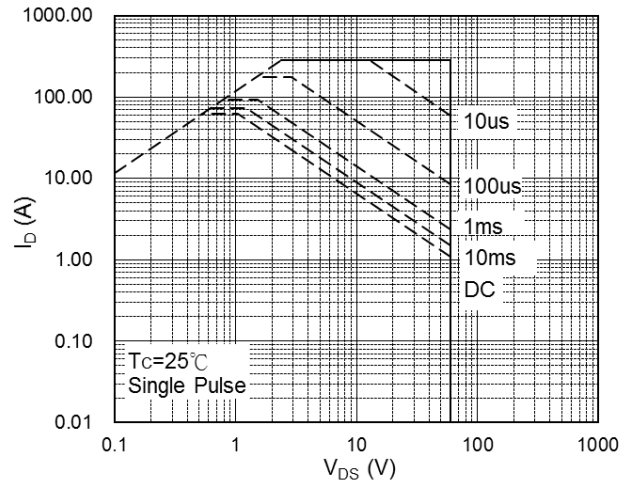
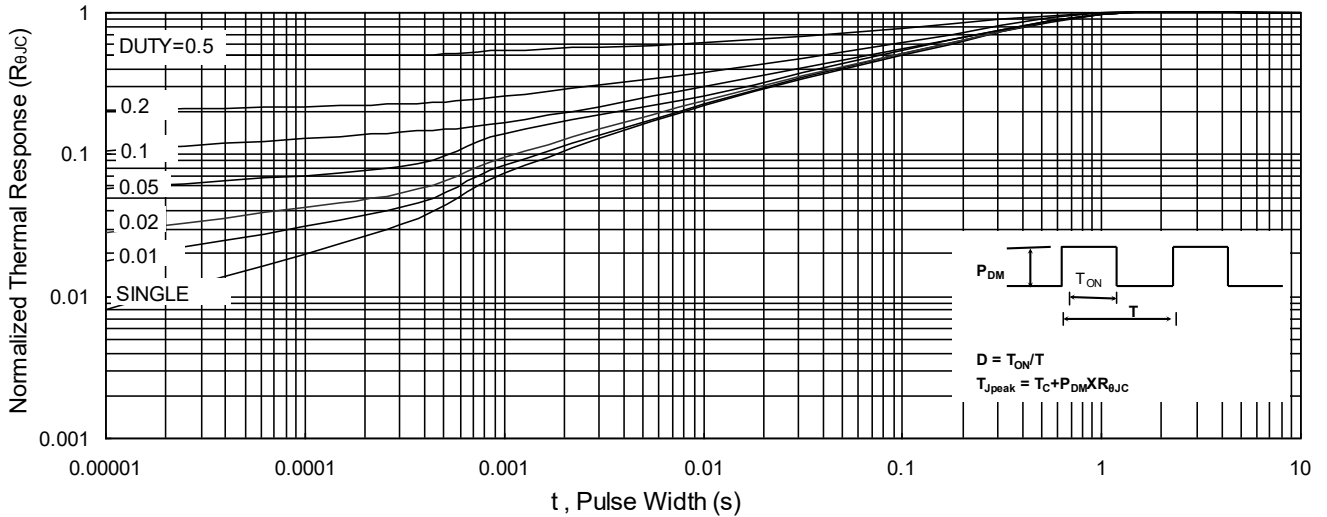
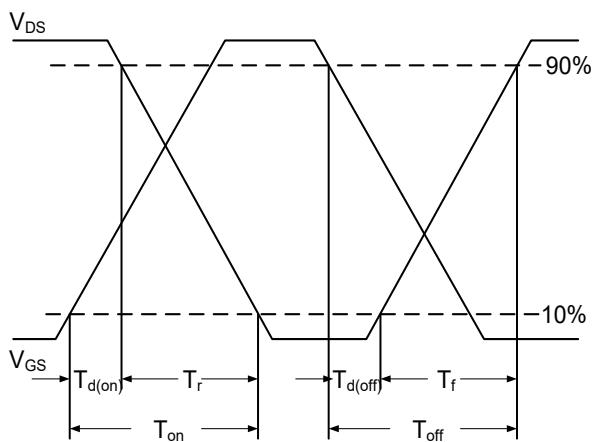
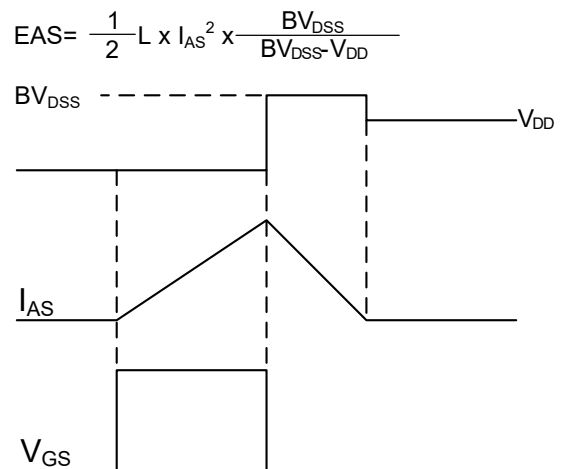
**N-Channel Enhancement Mode MOSFET****Electrical Characteristics** ($T_J=25^\circ\text{C}$, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\mu A$	60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=48V, V_{GS}=0V$	---	---	1	μA
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=250\mu A$	1.2	---	2.5	V
I_{GSS}	Gate Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0V$	---	---	± 100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	$V_{GS}=10V, I_D=20A$	---	7	8.5	$m\Omega$
		$V_{GS}=6V, I_D=15A$	---	9.5	12	$m\Omega$
Dynamic Characteristics ^⑤						
C_{iss}	Input Capacitance	$V_{GS}=0V, V_{DS}=30V, \text{Freq.}=1\text{MHz}$	---	3307	---	pF
C_{oss}	Output Capacitance		---	201	---	
C_{rSS}	Reverse Transfer Capacitance		---	151	---	
$T_{d(on)}$	Turn-on Delay Time	$V_{DD}=30V, V_{GS}=10V, R_G=3.3\Omega, I_D=20A$	---	16.2	---	nS
T_r	Turn-on Rise Time		---	41.2	---	
$T_{d(off)}$	Turn-off Delay Time		---	56.4	---	
T_f	Turn-off Fall Time		---	16.2	---	
Q_g	Total Gate Charge	$V_{GS}=30V, V_{DD}=10V, I_D=18A$	---	57	---	nC
Q_{gs}	Gate-Source Charge		---	8.7	---	
Q_{gd}	Gate-Drain Charge		---	14	---	
Source-Drain Characteristics						
V_{SD} ^④	Diode Forward Voltage	$I_S=1A, V_{GS}=0V$	---	---	1.2	V
t_{rr}	Reverse Recovery Time	$I_F=20A, di_F/dt=100A/\mu s$	---	22	---	nS
Q_{rr}	Reverse Recovery Charge		---	72	---	nC

Note ④: Pulse test (pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$).

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

N-Channel Enhancement Mode MOSFET
Typical Characteristics

Fig.1 Typical Output Characteristics

Fig.2 On-Resistance vs Gate-Source Voltage

Fig.3 Forward Characteristics of Reverse

Fig.4 Gate-Charge Characteristics

Fig.5 Normalized $V_{GS(th)}$ vs T_J

Fig.6 Normalized $R_{DS(on)}$ vs T_J

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Fig.7 Capacitance

Fig.8 Safe Operating Area

Fig.9 Normalized Maximum Transient Thermal Impedance

Fig.10 Switching Time Waveform

Fig.11 Unclamped Inductive Switching Waveform

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TO-263 Package Outline Data
