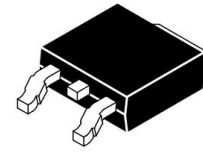


Features

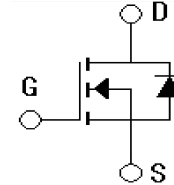
- N-Channel, Low $R_{DS(on)}$
- Low Gate Charge
- Optimized For Fast-switching Applications



TO-252

Applications

- Engine Management Systems
- Body Control Electronics
- DC-DC Converters
- Motor Control



Absolute Ratings ($T_C=25^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DSS}	60	V
Transient Gate-Source Voltage	V_{GSM}	± 30	V
Continuous Gate-Source Voltage	V_{GSS}	± 20	V
Drain Current -continuous	I_D	100	A
Drain Current - pulse(note 1)	I_{DM}	150	A
Single Pulsed Avalanche Energy(note 2)	E_{AS}	200	mJ
Power Dissipation	P_D	$T_C=25^\circ\text{C}$	W
		$T_C=25^\circ\text{C}$	
Operating and Storage Temperature Range	T_J, T_{STG}	$-55 \sim +150$	$^\circ\text{C}$
Maximum Lead Temperature for Soldering Purposes	T_L	300	$^\circ\text{C}$

Electrical Characteristics($T_{CASE}=25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Tests conditions	Min	Type	Max	Units
Off-Characteristics						
Drain-Source Voltage	BV_{DSS}	$I_D=250\mu\text{A}, V_{GS}=0\text{V}$	60	-	-	V
Drain cut-off current	I_{DSS}	$V_{DS}=60\text{V}, V_{GS}=0\text{V}$	-	-	1	μA
Gate-body leakage current	I_{GSS}	$V_{DS}=0\text{V}, V_{GS}=\pm 20\text{V}$	-	-	± 100	nA
On-Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=250\mu\text{A}$	2	-	4	V

Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} =10V,I _D =20A (note 3)	-	3	3.8	mΩ
transconductance	G _{fs}	V _{DS} = 20V,I _D = 20A		50		S
Dynamic Characteristics						
Input capacitance	C _{iss}	V _{DS} =30V,V _{GS} =0V, f=1.0MHz(note 4)	-	4556	-	pF
Output capacitance	C _{oss}		-	1383	-	pF
Reverse transfer capacitance	C _{rss}		-	105.2	-	pF
Internal Gate Resistance	R _{Gin}	V _{DS} =0V, V _{GS} =0V,f=1.0MHz	-	0.66	-	Ω
Switching Characteristics						
Turn-On delay time	td(on)	V _{DD} =30V,I _D =90A., R _G =3.5Ω	-	13.2	-	ns
Turn-On rise time	t _r		-	11.7	-	ns
Turn-Off delay time	T _{d(off)}		-	31	-	ns
Turn-Off Fall time	t _f		-	12	-	ns
Total Gate Charge	Q _g	V _{DS} =30V, I _D =90A, V _{GS} =10V(note 4)	-	95.4	-	nC
Gate-Source charge	Q _{gs}		-	21.6	-	nC
Gate-Drain charge	Q _{gd}		-	20.4	-	nC
Drain-Source Diode Characteristics						
Drain-Source Diode Forward Voltage	V _{SD}	V _{GS} =0V,I _S =40A(note 3)	-	0.85	1.2	V
Continuous Drain-Source Diode Forward Current	I _S		-	100	-	A
Reverse recovery time	t _{rr}	V _{GS} =0V,I _F =30A dI _F /dt=100A/us	-	50.5	-	ns
Reverse recovery charge	Q _{rr}		-	80.8	-	nC

Thermal Characteristic

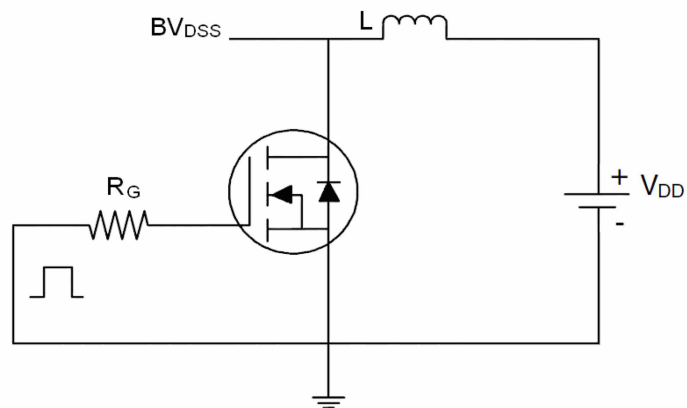
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case,Max	$R_{\theta JC}$	0.8	$^{\circ}C/W$
Thermal Resistance, Junction-to-Ambient,Max	$R_{\theta JA}$	38	

Notes:

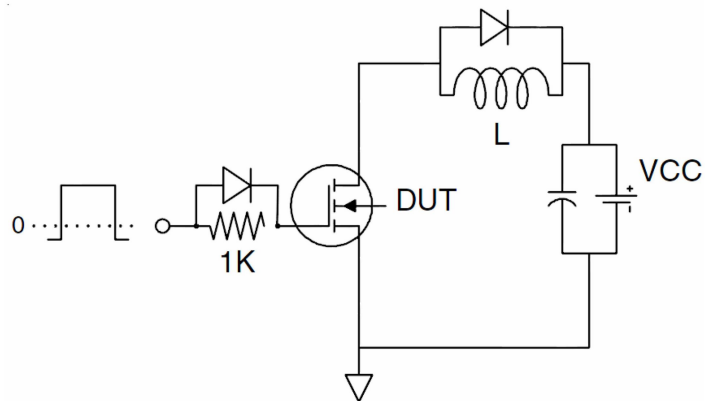
1. Pulse width limited by maximum allowable junction temperature
2. $L=0.2mH, I_{AS}=39A, V_{DD}=30V, V_{GS}=10V$, starting $T_J=25^{\circ}C$
3. Pulse width $\leq 300\mu s$; duty cycle $\leq 1\%$.
4. Essentially independent of operating temperature

Test Circuit

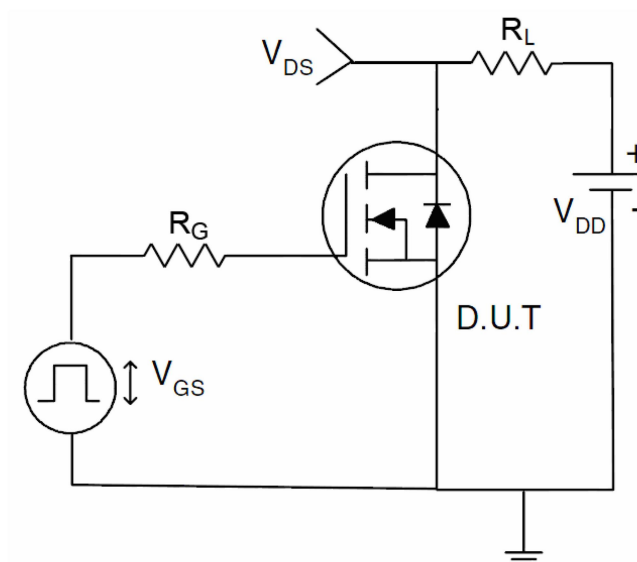
1) E_{AS} test Circuit



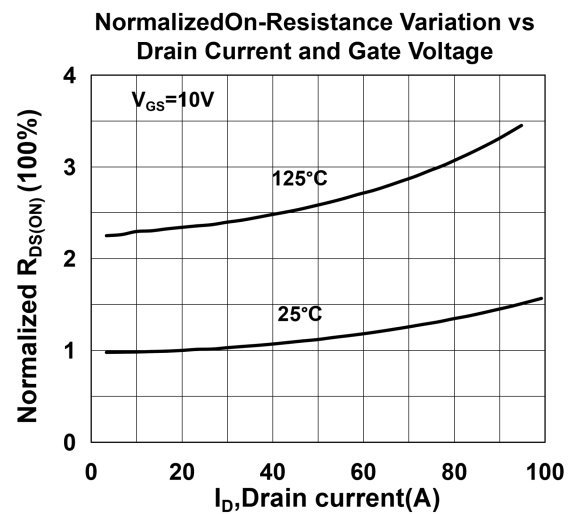
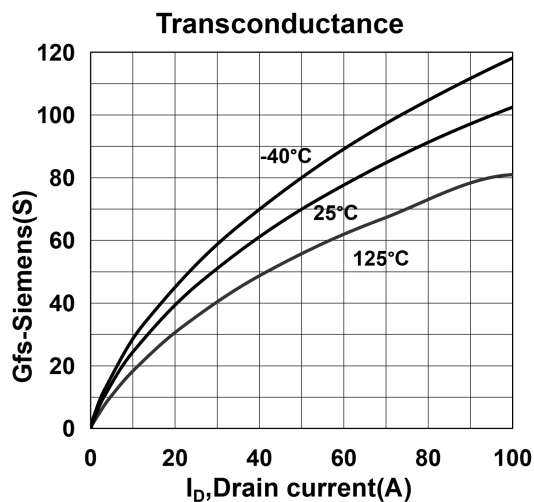
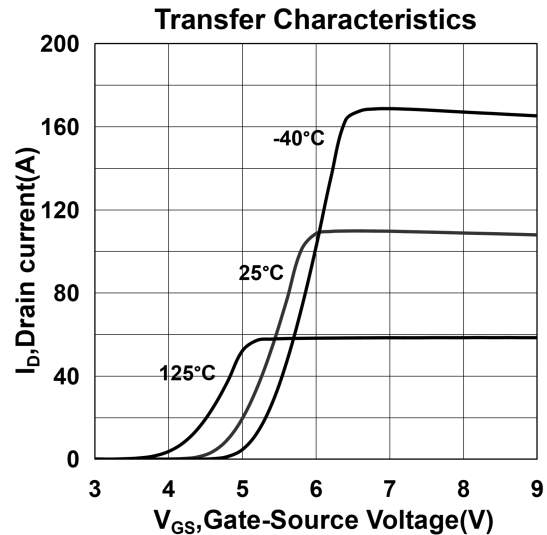
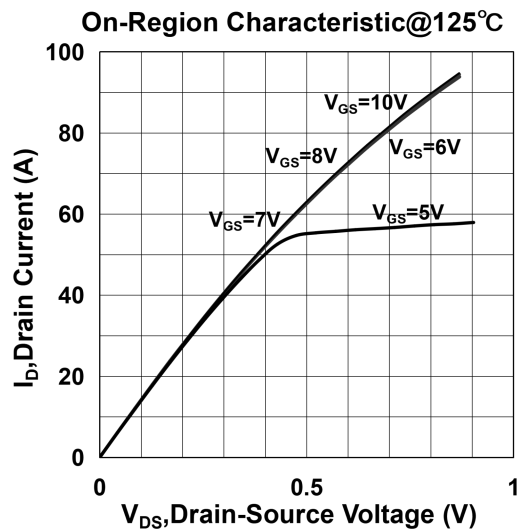
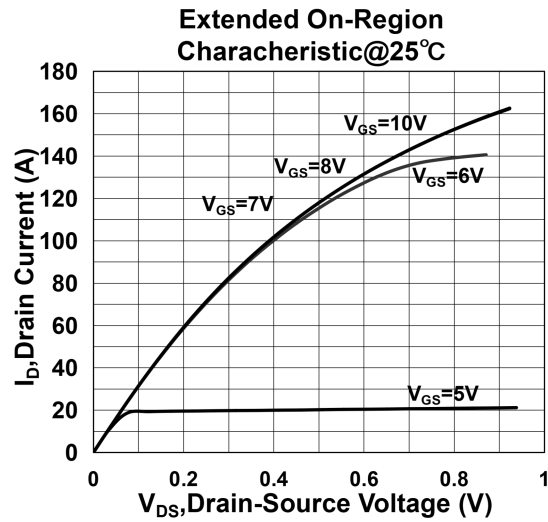
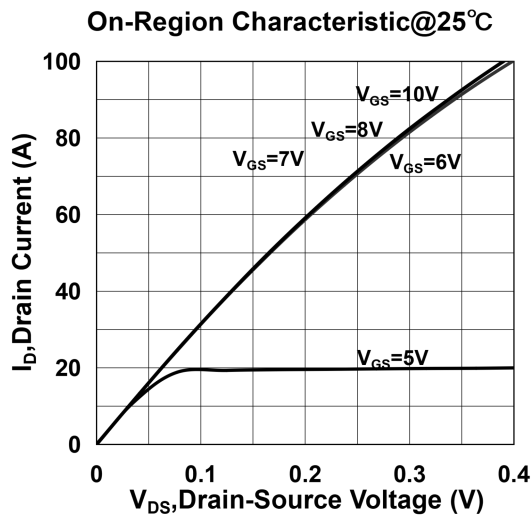
2) Gate charge test Circuit



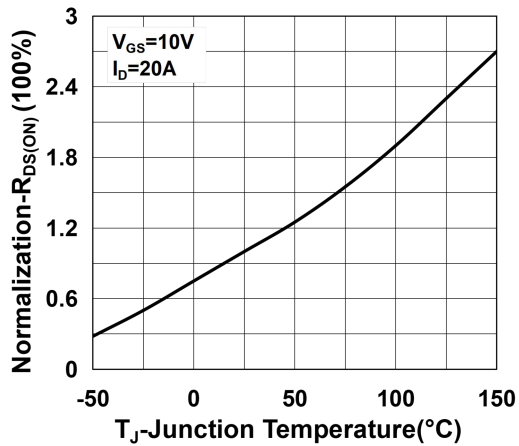
3) Switch Time Test Circuit



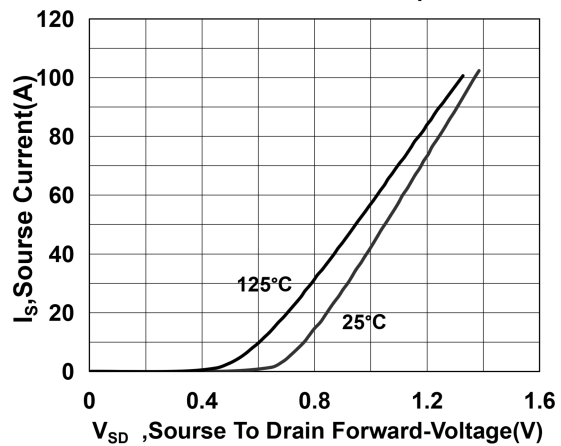
Typical Electrical and Thermal Characteristics (Curves)



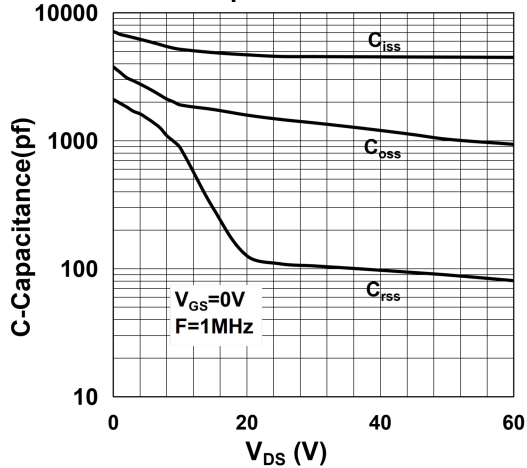
**Normalization On-Resistance
Variation vs Junction Temperature**



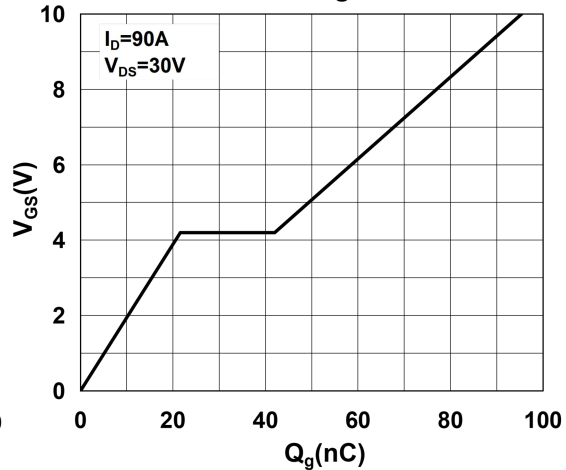
**Body Diode Forward Voltage Variation
with Source Current and Temperature**



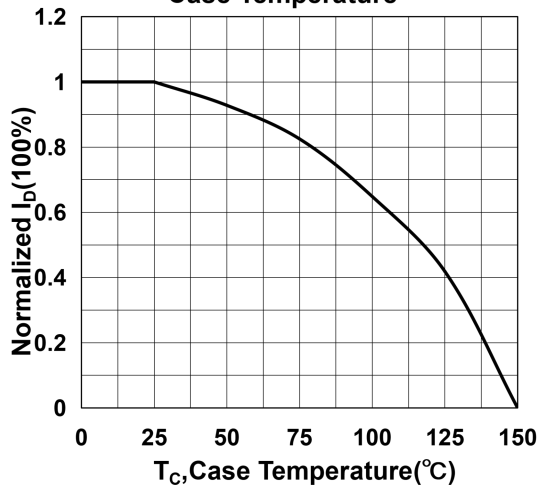
Capacitance



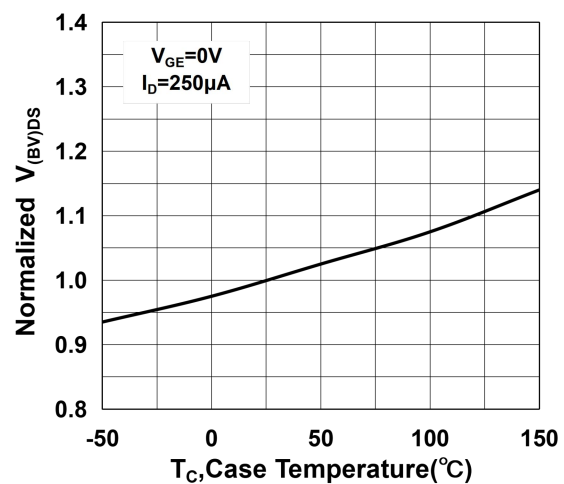
Gate Charge

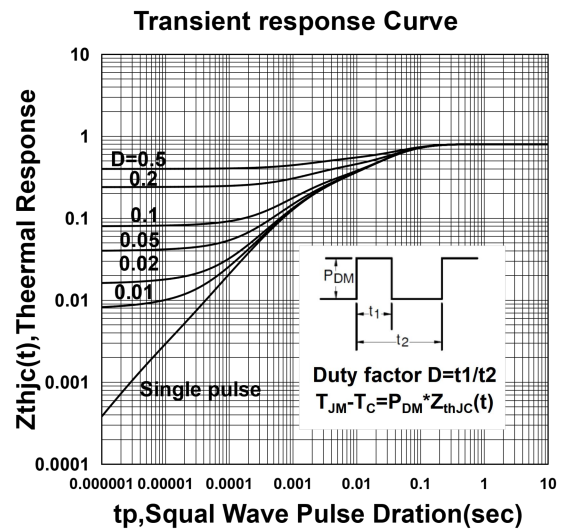
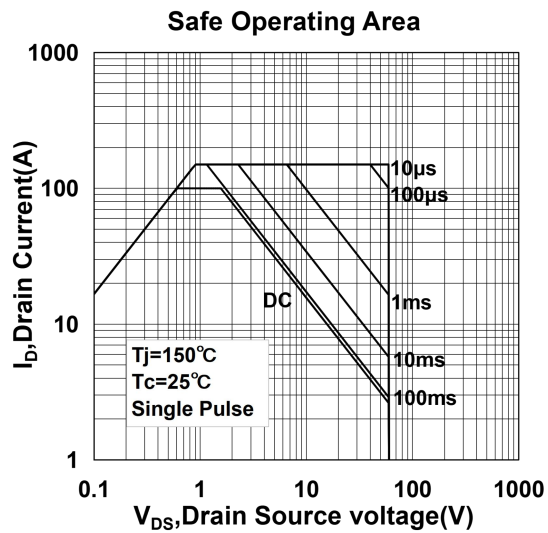
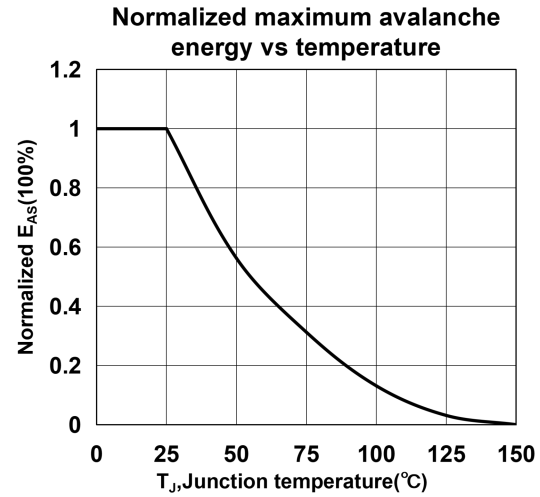
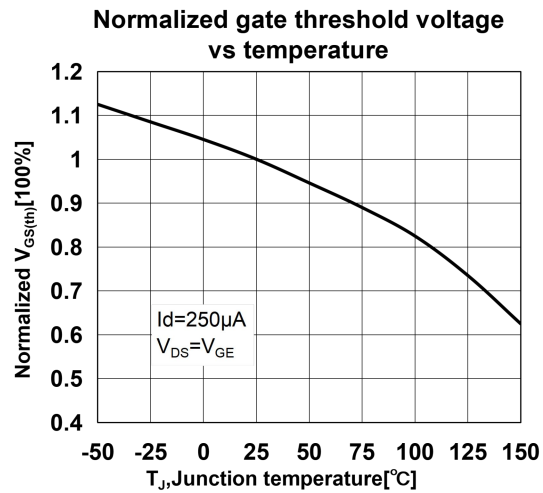


**Maximum Drain Current vs
Case Temperature**



Normalized $V_{(BV)DS}$ vs temperature





Package Mechanical DATA

