



Power MOSFETS

DATASHEET

LM50J90DEF6A

Dual N-Channel
Enhancement Mode MOSFET

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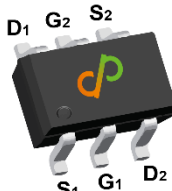
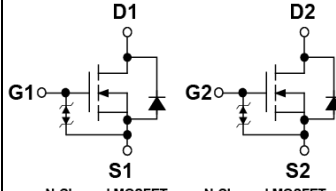


Quality Management Systems

ISO 9001:2015 Certificate

Dual N-Channel Enhancement Mode MOSFET

Pin Description

SOT-363 (TOP view)	Symbol	Symbol	Dual N-Channel	Unit
		V_{DSS}	50	V
		$R_{DS(ON)-Max}$	1.9	Ω
		I_D	0.26	A

Ordering Information

Feature

- Low V_{th} low gate drive
- ROHS Compliant & Halogen-Free
- ESD protection

Applications

- Small signal application
- Load switch

Ordering Information

Orderable Part Number	Package Type	Form	Shipping	Marking
LM50J90DEF6A	SOT-363	Tape & Reel	3000 / Tape & Reel	0□□□

Note : □□□ = Lot Code

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

Symbol	Parameter		Dual N-Channel	Unit
V_{DSS}	Drain-Source Voltage		50	V
V_{GSS}	Gate-Source Voltage		± 20	
T_J	Maximum Junction Temperature		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range		-55 to 150	$^\circ\text{C}$
$I_{DM}^{①}$	Pulse Drain Current Tested	$T_A=25^\circ\text{C}$	0.64	A
I_D	Continuous Drain Current	$T_A=25^\circ\text{C}$	0.26	A
		$T_A=70^\circ\text{C}$	0.2	
P_D	Maximum Power Dissipation	$T_A=25^\circ\text{C}$	0.25	W
		$T_A=70^\circ\text{C}$	0.2	

Thermal Characteristics

Symbol	Parameter		Rating	Unit
$R_{\theta JA}^{②}$	Thermal Resistance-Junction to Ambient	Steady State	500	$^\circ\text{C/W}$

Note ① : Max. current is limited by junction temperature.

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.

Dual N-Channel Electrical Characteristics (T_J=25°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 _{DS} =250uA	50	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =40V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =250uA	0.6	1.2	1.5	V
I _{GSS}	Gate Leakage Current	V _{GS} =±20V, V _{DS} =0V	-	-	±10	uA
R _{DS(ON)} Ⓢ	Drain-Source On-state Resistance	V _{GS} =10V, I _{DS} =0.22A	-	1.6	1.9	Ω
		V _{GS} =4.5V, I _{DS} =0.19A	-	1.7	2.2	
		V _{GS} =2.5V, I _{DS} =0.05A	-	2	-	
gfs	Forward Transconductance	V _{DS} =3V, I _{DS} =0.11A	-	0.6	-	S
Dynamic Characteristics ④						
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =30V, Freq.=1MHz	-	25	-	pF
C _{oss}	Output Capacitance		-	3.1	-	
C _{rss}	Reverse Transfer Capacitance		-	2.2	-	
td(ON)	Turn-on Delay Time	V _{GS} =10V,V _{DS} =50V, I _D =0.23A,R _{GEN} =10Ω	-	0.5	-	nS
t _r	Turn-on Rise Time		-	19.3	-	
t _{d(OFF)}	Turn-off Delay Time		-	26.3	-	
t _f	Turn-off Fall Time		-	22.2	-	
Q _g	Total Gate Charge	V _{GS} =4.5V,V _{DS} =50V I _D =1A	-	0.91	-	nC
Q _g	Total Gate Charge	V _{GS} =10V,V _{DS} =50V, I _D =1A	-	1.7	-	
Q _{gs}	Gate-Source Charge		-	0.3	-	
Q _{gd}	Gate-Drain Charge		-	0.3	-	
Source-Drain Characteristics						
V _{SD} Ⓢ	Diode Forward Voltage	I _{SD} =0.11A, V _{GS} =0V	-	0.8	1.1	V
t _{rr}	Reverse Recovery Time	I _F =0.11A, V _{GS} =0	-	7.2	-	nS
Q _{rr}	Reverse Recovery Charge	dI _F /dt=100A/μs	-	1.9	-	nC

Note ③ : Pulse test (pulse width≤300us, duty cycle≤2%).

Note ④ : Guaranteed by design, not subject to production testing.

Dual N-Channel Typical Characteristics

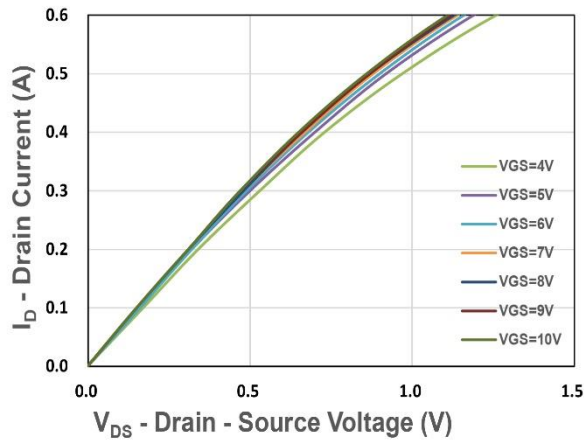


Figure 1. Output Characteristics

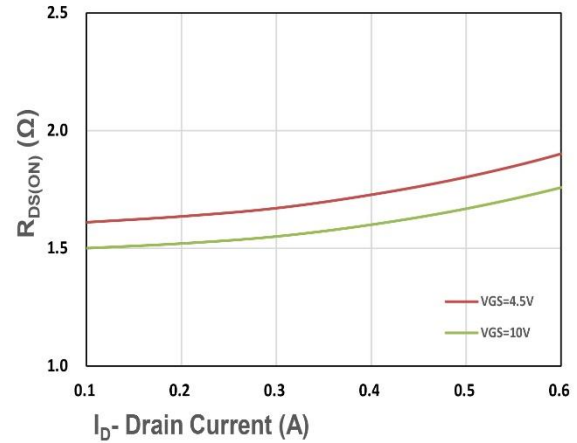


Figure 2. On-Resistance vs. I_D

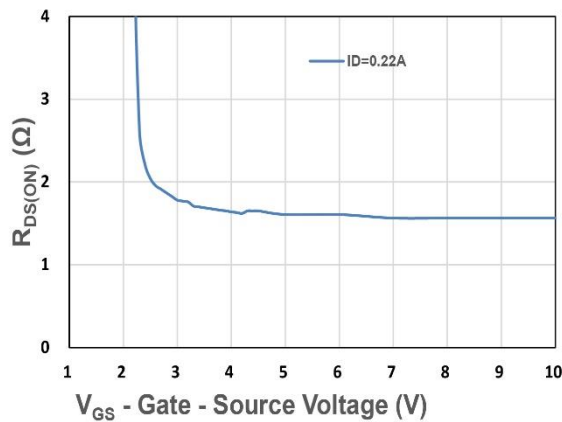


Figure 3. On-Resistance vs. V_{GS}

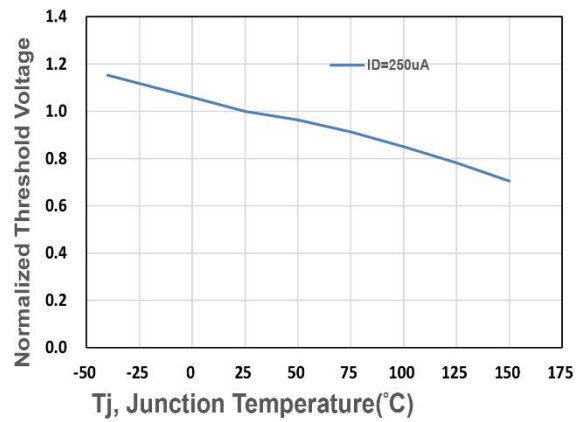


Figure 4. Gate Threshold Voltage

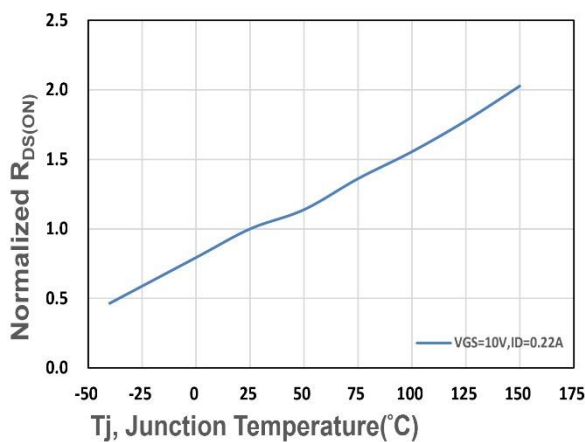


Figure 5. Drain-Source On Resistance

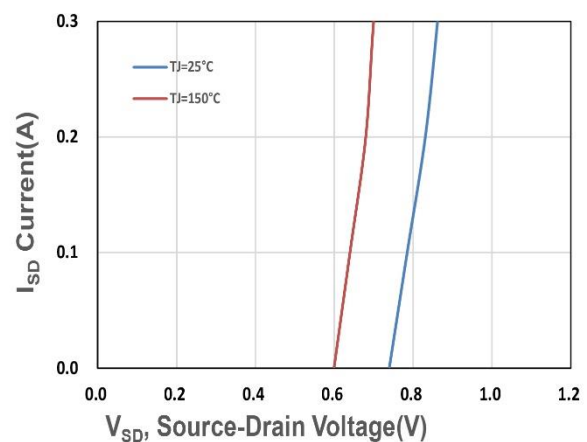


Figure 6. Source-Drain Diode Forward

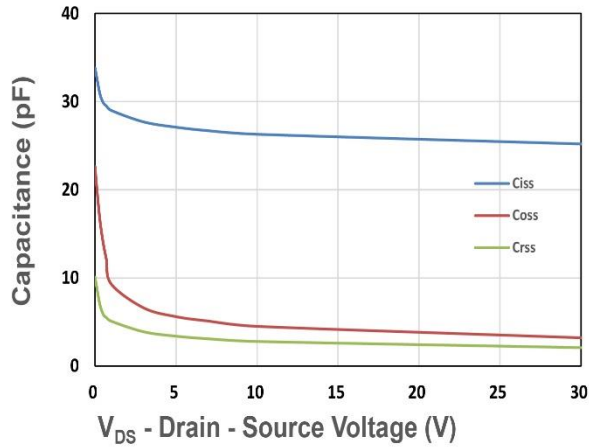


Figure 7. Capacitance

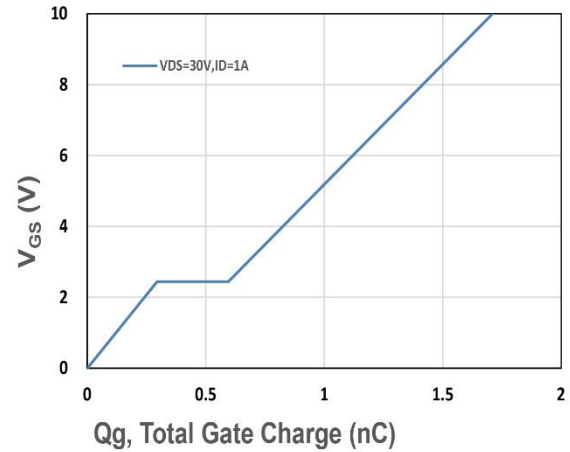


Figure 8. Gate Charge Characteristics

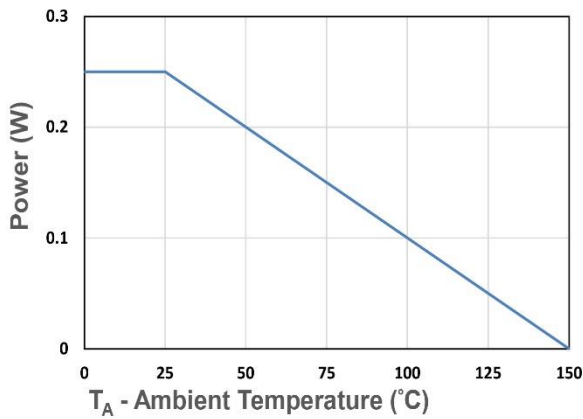


Figure 9. Power Dissipation

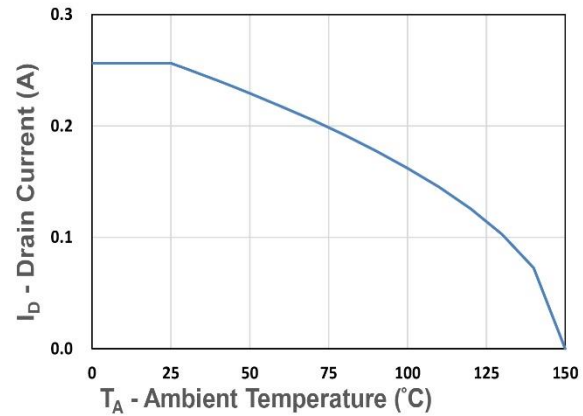


Figure 10. Drain Current

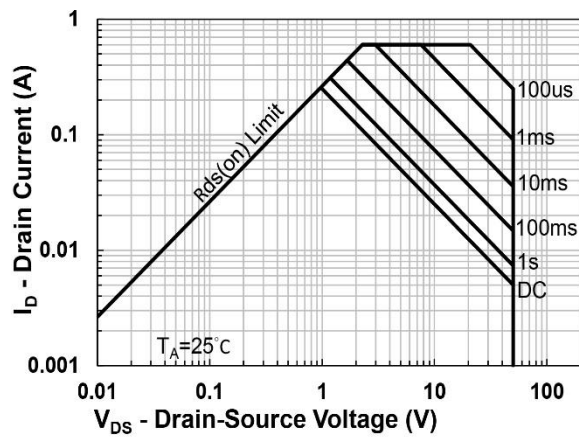


Figure 11. Safe Operating Area

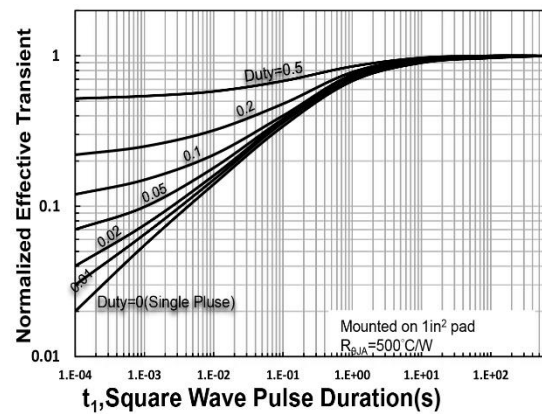


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance